ORIGINAl RESEARCH ARTICLES


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Emergency care occurs on a continuum. Developing prehospital emergency care systems that are integrated with in-hospital emergency care systems can be a sustainable and effective way to help address the large morbidity and mortality of acute disease in Africa. Unfortunately, development of such prehospital systems across Africa has been slow to progress for many reasons, including feared cost implications, no agreed optimal system structure and function, and poor advocacy.

In November 2013, the African Federation for Emergency Medicine (AFEM) convened a second expert and stakeholder meeting in Cape Town, South Africa, with the objective of reaching consensus on a few position statements to facilitate advocacy and to guide the development of emergency care in Africa. The objective of this paper is to report the outputs and position statements emerging from the AFEM Out-of-Hospital Emergency Care Workgroup consensus process.

The term “Out-of-Hospital Emergency Care” was agreed by consensus and defined by the Workgroup as a suitable umbrella term for use in Africa that refers to the full spectrum of emergency care that occurs outside healthcare facilities. Critical components of this system were defined, including first responder care (tier-one) systems, and prehospital care and emergency medical services (tier-two) systems. The Workgroup provided a practical, adaptable and flexible set of guidelines and expert recommendations to facilitate advocacy and development of out-of-hospital emergency care systems in needly African settings.

Future directions of the AFEM Out-of-Hospital Emergency Care Workgroup include creating an online Toolkit. This will serve as a repository of template documents to guide implementation and development of clinical care, education, transportation, public access, policy and governance.


Le terme "Soins d’urgence hors des centres hospitaliers" a été accepté par consensus et défini par le Groupe de travail comme un terme générique pouvant être utilisé en Afrique en référence à la gamme complète des soins d’urgence fournis en dehors des établissements de soins de santé. Les composantes essentielles de ce système ont été définies, notamment les systèmes de prise en charge par le premier intervenant (premier niveau) et les systèmes pré-hospitaliers de soins et de services médicaux d’urgence (deuxième niveau). Le groupe de travail a produit un ensemble de directives et de recommandations préconisées par les experts afin de faciliter le plaidoyer et le développement de systèmes de soins d’urgence hors des centres hospitaliers dans les régions africaines sinistrées.


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Background

There is an undisputed need for emergency care systems in Africa to help relieve the large burden of disease from acute and emergent conditions.\(^1\) The Disease Control Priorities in Developing Countries Project estimates that as much as 45% of deaths and 35% of disability-adjusted life years can be addressed by developing emergency care systems in low- and middle-income countries (LMICs).\(^5\)

Comprehensive emergency care occurs on a continuum.\(^5,6,11-13\) Prehospital care refers to the acute and emergency care delivered outside the walls of a fixed healthcare facility.\(^5\) All the steps leading up to, and following, prehospital care are critical to minimize a victim’s likelihood of death or disability. This “chain of survival” includes recognition of the emergency, bystander-initiated care, access to prehospital emergency care services, prehospital care delivery, emergency transportation, emergency centre care and definitive care.\(^5,6,12-15\)

Mock et al. previously demonstrated that in LMICs without formal emergency care systems, nearly 80% of deaths due to severe injury occurred in the prehospital setting.\(^8\) This landmark analysis quantified the burden of disease potentially averted through developing prehospital trauma care systems in low-resource settings. In 2005, the World Health Organization (WHO) advocated strengthening of integrated formal trauma care systems in low-resource settings to alleviate the burden of disease from injuries.\(^8\) Developing prehospital trauma care systems was emphasized as an integral component of this system.\(^7\) The World Health Assembly, in Resolution 60.22, recommended improved organization and planning for provision of trauma and emergency care as an essential part of integrated health-care delivery.\(^16\)

In 2011, the African Federation for Emergency Medicine (AFEM), through a consensus process involving over 140 experts, proposed that local African stakeholders actively advocate for the development of prehospital emergency care systems as a health system priority in their country.\(^9\)

Prehospital emergency care systems in Africa

To facilitate development of sustainable, effective, low-resource prehospital trauma care systems across Africa, WHO recommends developing two tiers of prehospital care.\(^5\) In tier-one, large volumes of trained community members serve as first responders, thereby providing a cost-effective front line for rapid medical response. In tier-two, trained professional responders deliver more specialized prehospital care in a more formal, coordinated and integrated manner.\(^5\) Although the WHO two-tiered approach was envisioned as a trauma care system, the applicability and suitability of extending this model to non-traumatic prehospital emergency care systems are appealing.

Reports from several African nations indicate small-scale success with the initial development of both tiers of prehospital care systems. In Ghana, Madagascar, Uganda and South Africa, tier-one systems were piloted using taxi-drivers, police officers, local councilmen and community laypersons, as community-based first aid responders.\(^17-20\) These programs demonstrated strengths of local-appropriateness, practicality, sustainability, and cost-effectiveness. In 2011, the African First Aid Materials Guidelines were developed by the Belgian Red Cross-Flanders, through advocacy by the WHO and World Bank, as a means to further promote locally-appropriate first responder (i.e. tier-one) training in African regions without formal prehospital care systems.\(^21,22\) Experts have called for a wide-spread educational dissemination of such material, from school children to the elderly population, across Africa.\(^23-25\)

In Rwanda, Malawi, Ghana, and Kenya, SMS text messaging, motorcycle-ambulances and traditional ambulance services with trained prehospital personnel were developed to facilitate delivery of formal prehospital care.\(^13,26-29\) These tier-two systems addressed a diversity of acute conditions, including emergency obstetric care, medical emergencies, and acute trauma care. Although generally cost-effective at alleviating the acute burden of disease, tier-two systems continue to prove financially and technically challenging to develop in low-resource African environments.\(^5,10-14\)

Despite small-scale, successful tier-one and two models, there is a paucity of large-scale prehospital care systems with proven efficacy, particularly in sub-Saharan Africa.\(^9,14\) Primary reasons cited include under documentation of the acute burden of disease, the lack of an integrated approach to acute care, no standards, financial barriers, poor local advocacy, non-availability of acute disease epidemiologic data, lack of evidence-based recommendations, paucity of technical expertise, and lack of practical guidelines, resource documents and toolkits.\(^5,9,11,23,30\)

Objective

In 2013, AFEM convened a second expert and stakeholder meeting in Cape Town, South Africa, with the objective of reaching consensus on a few position statements to facilitate advocacy and to guide the development of emergency care in Africa. The AFEM Out-of-Hospital Emergency Care (OHEC) Committee facilitated one of three workgroups. The objective of this paper is to describe the consensus process and the position statements that resulted from that meeting.

Process and methodology

In total, 135 persons representing experts in African acute and emergency care, public health, medical education, and research were in attendance at the one day 2013 AFEM Consensus Conference, representing 18 African and 14 non-African countries. Thirty-eight of the conference participants (28% of the total) participated in the OHEC Workgroup consensus process. Key items for discussion were prepared by three OHEC Workgroup moderators (NMM, SdV, RN) and framed around the driving objective of the larger consensus conference i.e. to reach consensus on advocacy and development of emergency care systems in Africa.

To facilitate the discussion, the scope of emergency care was defined in a previous AFEM Consensus Conference as the provision of initial resuscitation, stabilization, and treatment to acutely ill and injured patients and delivery of those patients to the best available definitive care, regardless of their ability to pay.\(^9\) Consensus recommendations were expected to conform to the following principles: appropriate for integra-
tion into existing African health systems, cost-effective, have a measurable impact, and be scalable.

A background presentation was delivered by the moderators to the members of the OHEC Workgroup to equilibrate knowledge on the current state of prehospital care in Africa, to review various care models, and to underscore some of the essential elements for prehospital emergency care systems advocated by worldwide authorities.

The OHEC Workgroup agenda was then separated into 3 content areas for detailed consensus group discussion: (1) terminology, (2) system development, and (3) advocacy. Consensus was decided by a majority vote after discussion of each content area. At the end of the consensus process, OHEC Workgroup outputs were shared with the larger group present at the AFEM Consensus Conference for further feedback or objections.

**Outputs**

**Terminology**

The OHEC Workgroup agreed that the terms “out-of-hospital,” “prehospital,” and “emergency medical services (EMS)” were used erroneously and interchangeably, as evidenced during group discussion and through pre-review of the African emergency care literature. The OHEC Workgroup concluded that consensus on an OHEC model, terminology and semantics must be reached prior to consensus discussions regarding system development or advocacy.

“Out-of-Hospital Emergency Care (OHEC)” was agreed by consensus and defined by the Workgroup as a suitable umbrella term for use in Africa which refers to the full spectrum of emergency care that occurs outside healthcare facilities. This broadly includes care delivered by both laypersons and professional responders. OHEC begins with first responder care upon the recognition of a perceived or actual medical emergency. Easy access to emergency care services is crucial, where OHEC is delivered in a timely, safe, and effective manner by a trained personnel or provider. OHEC culminates in locally-appropriate emergency transportation to the closest, most suitable level of care. In certain situations, it may be locally appropriate for patients to be treated and released at the scene, especially if only minor conditions are identified by appropriately trained and authorized personnel.

“First Responder Care (FRC)” refers to OHEC in which the first emergency medical interventions are provided by a trained person within the community at the scene of the patient. It includes care provided by a spectrum of trained individuals (e.g. those knowledgeable in first aid, cardiopulmonary resuscitation, and scene management) who are integrated within a community.

“Prehospital Care (PHC)” was agreed upon to refer to out-of-hospital emergency care delivered by a professional provider with the ability to provide transport to a healthcare facility. This includes all the key elements of OHEC, namely bystander-initiated care, easy access to emergency care services, provision of medical care by trained prehospital practitioners, and emergency transportation to the closest, most suitable formal healthcare facility.

“Emergency Medical Services (EMS)” refer to formalized prehospital care, provided by emergency care professionals who respond to medical emergencies within a well-defined jurisdiction. EMS refers to an established entity, agency or system, which is appropriately integrated into the existing OHEC and facility-based healthcare system, thereby facilitating the coordinated, timely, and safe provision of emergency care and transportation to the most appropriate healthcare facility.

“Tier-one System” was agreed, by consensus, to refer to the foundation of the OHEC provided by first responders on a community level. Examples of tier-one OHEC systems include taxi-driver or police officer trauma programs in several African settings, and the Emergency First Aid Responder (EFAR) System, developed in South Africa.

“Tier-two System” refers to the next level of the OHEC system which provides more specialized prehospital care. Examples of tier-two OHEC systems include national ambulance systems and maternal obstetric motorbike units.

In an effort to conceptually unify all the above terminology and concepts, an Out-of-Hospital Emergency Care Model was agreed upon in which OHEC is the umbrella term referring to first responder care (FRC), prehospital care (PHC) and emergency medical services (EMS), all integrated into a two-tiered structure (Figure 1).

Emergency care occurs in a continuum in which discrete phases of care occur in different settings, requiring varied resources and personnel. Figure 2 illustrates how the OHEC model plays an early and critical role within the African continuum of emergency care.

![Figure 1 Model of African Out-of-Hospital Emergency Care (OHEC) systems.](image-url)
Development of Out-of-Hospital Emergency Care systems

The urgent need for the development of African OHEC systems superimposed with the local challenges to their development, including poor resources, lack of technical expertise, underdevelopment of in-hospital emergency care, compelled the OHEC Workgroup to adopt a practical approach to framing the discussion and reaching consensus around the development of OHEC systems.4–6,9,11

WHY should OHEC systems be developed?
Several international public health organizations and authorities have emphasized the importance of ubiquitous access by a population to safe OHEC, an integral component of emergency care, as a fundamental healthcare right, thereby providing a means to address the acute burden of disease in low-resource settings across Africa.

HOW should OHEC development be accomplished?
A dedicated individual or unified entity is urged to serve as the champion and catalyst for OHEC development, as an initial necessary step. Stakeholder input and buy-in, at the community, healthcare and governance levels, is critical and must occur in advance of implementation. A two-tiered system model approach is recommended. If there are no existing OHEC systems, we advocate developing community-based (tier-one) systems first, then layering on basic then advanced (tier-two) PHC systems. Where immature OHEC systems exist, we encourage the strengthening of community-based (tier-one) OHEC to support growing, formal (tier-two) PHC and EMS systems. Systems should be customized to address, the needs of the local population, considering existing infrastructure, leading causes of morbidity and mortality, and integration within the larger healthcare system. Additionally, we support development efforts that build upon existing resources, such as existing forms of transportation and community health resources. Of note, we caution development of ‘Western-style’ ambulance systems as the initial and sole approach to OHEC development in low-resource African settings.

WHAT should be the goal of the OHEC system?
A well-defined and deliberate strategic plan, to include realistic short-, medium- and long-term objectives, is strongly encouraged. At both tiers, we advocate for the following attributes: accessible, timely, safe, effective, scalable, sustainable, cost-effective, and have a measurable impact/outcome. (The specific definitions and measurement metrics of these attributes will be subsequently defined by the OHEC Workgroup and available in an AFEM OHEC Toolkit.) Key components of the system (tier-one or tier-two) should include easy public access and awareness, timely, safe, effective, and appropriate transportation and medical interventions, effective modalities for communication, care delivery by trained care providers (first responders or professional), and must be supported by enabling policies or a legal framework. (The specific definitions and measurement metrics of these components will be subsequently defined by the OHEC Workgroup and available in an AFEM OHEC Toolkit.)

WHERE should development begin?
OHEC priority and focus areas should be guided by a formal need assessment and be laid out in the aforementioned Strategic Plan. If OHEC systems exist, we recommend scale-up activities of effective and sustainable existing OHEC systems. We suggest targeting development of OHEC in one or more of the following three high-yield areas: (1) in population-dense regions, (2) regions with the highest morbidity or mortality, and/or, (3) in response to African health priority conditions, such as maternal care, trauma, paediatric respiratory and diarrheal illnesses, and malaria.

Advocacy for development of Out-of-Hospital Emergency Care systems

Across Africa, other non-healthcare agendas, including education, nutrition, and public infrastructure, compete with
healthcare for priority in investment and development.\textsuperscript{1,2,4} We lay out a practical approach and a roadmap to advocacy for developing OHEC systems in the low-resource settings of Africa.

**WHEN should system development be encouraged?**
The time is now to address both the current and growing burden of acute disease in Africa.

**WHY is advocacy necessary for OHEC system development?**
OHEC systems will help address the large burden of disease from emergency conditions in Africa, if implemented strategically. Informed advocates and champions may be best positioned to offer this perspective to local, national and international stakeholders. Informed advocates and champions should be vocal so that systems are developed with strong vision.

**WHO should advocate for the development of OHEC?**
Advocacy for OHEC should be driven by individuals, advocacy groups, medical professional groups, public health agencies, and/or governmental agencies functioning at the community, municipal, regional, national, and/or international level. Champions may originate from the public or private sector, or may be a partnership of the two. We encourage multi-disciplinary approaches to advocacy.

**WHAT components and attributes of OHEC systems should be promoted?**
As a first step, we recommend the development of a local Strategic Plan, which will serve as a blueprint and roadmap for short-, medium-, and long-term OHEC system development. We recommend this Strategic Plan be reviewed periodically. We recommend the OHEC system be developed in two tiers: first responder care (tier-one) and prehospital care & emergency medical services (tier-two). In settings with no existing tier-two systems, we advocate development and strengthening of one-system first to serve as the foundation, then subsequently layering on tier-two systems. In settings where immature OHEC systems exist, we recommend strengthening tier-one systems to form the foundation and to support growing tier-two systems. We encourage development of OHEC systems that are accessible, timely, safe, effective, scalable, sustainable, cost-effective, locally-appropriate, and have measurable impacts and outcomes. Where possible, we encourage that OHEC systems help address neglected, vulnerable, minority and special groups, such as paediatric, psychiatric and geriatric populations.

**WHERE should advocacy occur?**
AFEM strongly encourages that OHEC advocates and champions solicit buy-in at three stakeholder levels: policy-makers, healthcare officials and local community members. Advocacy can also be targeted to international health and/or funding agencies.

**HOW should advocacy occur?**
Leading international health authorities, including the World Health Organization, the World Health Assembly, the World Bank, and the African Federation for Emergency Medicine, have advocated developing OHEC systems as an integral part of emergency care systems. We urge OHEC champions to reference existing advocacy and policy documents from these international agencies to bolster their efforts. We strongly recommend that local or regional (acute) burden of acute disease data be gathered and presented to stakeholders to mount an evidence-based argument for the development of OHEC systems. Champions should demonstrate specifically how OHEC systems could help address some of the local, national or regional public health priorities, such as MDGs and trauma care. Published reports from other low-resource international settings exist which detail the benefit conferred by developing OHEC systems. We recommend these be showcased as success stories worthy of local emulation. Such evidence will be made available in the AFEM OHEC Toolkit. Local champions and advocates are also encouraged to creatively leverage opportunities around larger, critical public health initiatives to develop OHEC systems.

**Conclusions**
The large burden of acute disease in Africa can be substantially addressed by effective, integrated emergency care systems, of which non-hospital emergency care plays a critical role. The AFEM 2013 OHEC Workgroup consensus process proved an effective and productive method to arrive at expert agreement towards non-hospital based emergency care development and advocacy across Africa. ‘Out-of-hospital emergency care’ was strategically selected as an umbrella term to include both first-responder care (tier-one) and prehospital care (tier-two). Given the varied economic, technical and human resources’ challenges associated with developing emergency care systems in low-resource African settings, it was agreed that ‘Western-style’ emergency medical services (EMS) systems represent the most costly and specialized of several approaches to building effective tier-two care systems appropriate for Africa.

It is our hope that these consensus statements will help promote the advancement of out-of-hospital emergency care across needy African settings. Subsequent efforts by the AFEM OHEC Workgroup will target the development of a Toolkit to serve as a repository of policy and technical documents to further assist the formation, growth and assessment of OHEC systems across Africa.

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Conflicts of interest

The authors declare no conflict of interest.

References


