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Developing metrics for emergency care research in low- and middle-income countries



Développer des outils de mesure pour la recherche en matière de soins d'urgence dans les pays à faible et moyen revenus

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Introduction: There is little research on emergency care delivery in low- and middle-income countries (LMICs). To facilitate future research, we aimed to assess the set of key metrics currently used by researchers in these settings and to propose a set of standard metrics to facilitate future research.

Methods: Systematic literature review of 43,109 published reports on general emergency care from 139 LMICs. Studies describing care for subsets of emergency conditions, subsets of populations, and data aggregated across multiple facilities were excluded. All facility- and patient-level statistics reported in these studies were recorded and the most commonly used metrics were identified.

Results: We identified 195 studies on emergency care delivery in LMICs. There was little uniformity in either patient- or facility-level metrics reported. Patient demographics were inconsistently reported: only 33% noted average age and 63% the gender breakdown. The upper age boundary used for paediatric data varied widely, from 5 to 20 years of age. Emergency centre capacity was reported using a variety of metrics including annual patient volume ($n = 175, 90\%$); bed count ($n = 60, 31\%$), number of rooms ($n = 48, 25\%$); frequently none of these metrics were reported ($n = 16, 8\%$). Many characteristics essential to describe capabilities and performance of emergency care were not reported, including use and type of triage; level of provider training; admission rate; time to evaluation; and length of EC stay.

Conclusion: We found considerable heterogeneity in reporting practices for studies of emergency care in LMICs. Standardised metrics could facilitate future analysis and interpretation of such studies, and expand the ability to generalise and compare findings across emergency care settings.

Introduction: Peu d'études ont été réalisées sur la fourniture de soins d'urgence dans les pays à faible et moyen revenus (PFMR). Pour faciliter les futures études, nous avons cherché à évaluer l'ensemble de mesures clés actuellement utilisées par les chercheurs dans ces contextes, et à proposer un ensemble de mesures standard afin de faciliter les futures études.

Méthodes: Une analyse bibliographique systématique de 43 109 rapports publiés sur les soins d'urgence généraux provenant de 139 PFMR a été réalisée. Les études décrivant les soins pour des sous-ensembles de conditions urgentes, des sous-ensembles de populations, et des données agrégées issues de plusieurs structures ont été exclues. Toutes les statistiques au niveau des structures et des patients rapportées dans ces études ont été enregistrées et les mesures les plus couramment utilisées ont été identifiées.

Résultats: Nous avons identifié 195 études sur la fourniture de soins d'urgence dans les PFMR. Une faible uniformité a été observée dans les mesures rapportées, que ce soit au niveau des patients ou des structures. Les données démographiques relatives aux patients ont été rapportées de manière irrégulière: seulement 33% indiquaient l'âge moyen et 63% la répartition hommes/femmes. La limite d'âge supérieure utilisée pour les données pédiatriques variait dans une large mesure, allant de 5 à 20 ans. La capacité des centres d'urgence a été rapportée en utilisant un vaste éventail de mesures et notamment le volume annuel de patients ($n = 175, 90\%$); nombre de lits ($n = 60, 31\%$), nombre de chambres ($n = 48, 25\%$); souvent, aucune de ces mesures n'était rapportée ($n = 16, 8\%$). De nombreuses caractéristiques essentielles pour décrire les capacités et la performance des soins d'urgence n'étaient pas rapportées, et notamment l'utilisation des méthodes de triage et leur type, le niveau de formation des prestataires, le taux d'admission, le temps écoulé avant qu'une évaluation soit faite et la durée du séjour aux urgences.

Conclusion: Nous avons observé une hétérogénéité considérable dans les pratiques de compte-rendu relatives aux études portant sur les soins d'urgence dans les PFMR. Des mesures standardisées pourraient faciliter l'analyse et l'interprétation futures de telles études, et améliorer la capacité à généraliser et à comparer les conclusions entre les différents contextes de soins d'urgence.

African relevance

- Emergency systems development is a foundational part of developing emergency care in Africa.

- Emergency care research in Africa is small in comparison to the rest of the world.
- Defining key metrics used concurrently throughout African emergency care research is important to facilitate future research.

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Introduction

Emergency medicine plays an integral role in many health systems around the world, primarily in high-income countries.^{1–7} There is mounting evidence that high-quality emergency care has the potential to address a significant proportion of the global burden of disease, as advocates have called for the development of emergency care in low- and middle-income countries (LMICs).^{8–16} Recent outbreaks of pandemic infectious diseases such as MERS-CoV in the Middle East and Asia, and Ebola in West Africa highlighted the need for equipped emergency care facilities, staffed with trained personnel to stem the tide of such outbreaks and to form the front lines in the treatment of more common but increasingly important conditions such as non-communicable disease (NCDs) and injuries in LMICs.¹⁷

Despite the compelling need for more data on emergency care in LMICs, research in this area has been largely neglected. A 2015 systematic review of emergency facilities in LMICs found no published reports on emergency care in over half of LMICs.¹⁸ Where data were available, the review found that only a small set of metrics on emergency care delivery was reported consistently across facilities, and that researchers frequently used a wide array of ill-defined measures to describe EC characteristics and performance. This inconsistency has complicated inter-facility data comparison and study replication.^{16,19} More data are needed to understand current capabilities, expose deficits, and ultimately improve emergency care delivery in these resource-constrained settings.^{10,16,18–20}

In this study, we identify a set of key metrics commonly used by researchers to describe emergency care in LMICs and propose a standard set of data elements that would be practical to collect. A consensus on basic terminology and methodology has advanced the field of emergency medicine in high-income countries, and a clearly defined core set of metrics for describing emergency care in LMICs would similarly not only advance local emergency care research and quality improvement, but also allow for more effective cross-pollination and systems development.

Methods

We conducted a systematic review (PROSPERO registry: CRD42014007617) to identify published reports describing general emergency care delivered to an undifferentiated patient population in all 139 LMICs. For each LMIC, we searched PubMed, CINAHL, and all World Health Organization (WHO) regional indices using “[country name] + emerg*” as the search term. We performed a similar search on Google Scholar, but limited the search to within article titles given the large number of results. We also manually screened select non-indexed journals known to frequently publish research on emergency care. Reference lists of all studies included were further screened manually.

Results were screened by title and abstract, and selected for inclusion if they described facility-based emergency care provided to all patients, regardless of disease category or chief complaint. Articles published after 1989 in all languages were included provided an English or French abstract was available. We excluded studies focussed only on specific emergent conditions (e.g., stroke only), subsets of the general emergency

patient population (e.g., women only), or data aggregated from multiple departments or facilities, unless they provided general emergency facility statistics or data on the burden of diseases.

We evaluated the reporting frequency of data elements commonly found in published emergency care literature originating from LMICs. We created a database that continually expanded with new data fields as the systematic review progressed and new reported metrics were encountered. At the conclusion of the review, we selected publications that provided comprehensive descriptions of their facilities and patients, and used them as models to structure our recommendations for future research.

At the conclusion of our review, we presented our findings at the African Federation of Emergency Medicine consensus conferences, Addis Ababa 2014 and Cape Town 2015. Small group discussion amongst attendees provided invaluable insight into some of the local determinants and limitations to data collection and publication in certain settings. We incorporated lessons learnt from the group discussions on how to improve data standards into our recommendations. We highlight specific information to be recorded and reported by individual emergency facilities, to enable reliable inter-facility data comparisons and expose areas for improvement in specific locales.

Results

Fig. 1 shows the search strategy used to screen 43,109 published reports with 195 studies meeting our inclusion criteria. This resulted in descriptions of 192 unique facilities in 139 LMICs, as shown geographically in the map in Fig. 2. Fig. 3 presents the proportion of these publications that reported the data elements of interest.

As a whole, hospital characteristics were nearly universally reported, with the exception of whether it was located in an urban or rural setting. As a result, researchers curious as to the kinds of patients the facility served or its geographic access would have to use mapping software (e.g., Google Maps) to find an approximate location for the facility. Similarly, indicators of overall hospital size and patient capacity, such as the number of inpatient beds, were infrequently reported; however, could be found occasionally on the hospital webpage, if one existed. The physical layout of the emergency centre itself, including the number of emergency centre beds, was documented more often. The annual patient volume in the emergency centre was the most commonly reported marker for facility size, but the simultaneous reporting of the catchment area for the hospital or the number of outpatient visits per year was rare.

Although half of the studies referenced the availability of triage, further details on the processes for stratification of patient acuity were not routinely provided. For example, only 20% described the level of training of the healthcare provider performing the triage assessment and even less frequently the protocol used, if any. The level of training for the physicians staffing the EC was reported in only half of the publications, and less so for nurse staffing.

Approximately one-fifth of publications were general facility descriptions, without individual emergency facility patient sampling. When patient-level data for those study subjects

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