African Journal of Emergency Medicine (2012) **2**, 182–187

African Federation for Emergency Medicine

African Journal of Emergency Medicine

www.afjem.com
www.sciencedirect.com

Task shifting: Meeting the human resources needs for acute and emergency care in Africa

Transfert de tâches : Répondre aux besoins en ressources humaines pour les soins de courte durée et d'urgence en Afrique

Benjamin Terry [a,h,*], Mark Bisanzo [a,h], Mariah McNamara [a,h], Bradley Dreifuss [b,h], Stacey Chamberlain [c,h], Sara W. Nelson [d,h], Kyle Tiemeier [e,h], Ty Waters [f,h], Heather Hammerstedt [g,h]

[a] *Department of Emergency Medicine, University of Massachusetts Medical School, Worcester, MA 01655, United States*
[b] *Department of Emergency Medicine, University of Arizona, Salt Lake City, UT 84132, United States*
[c] *Department of Emergency Medicine, University of Illinois at Chicago, Chicago, IL 60612, United States*
[d] *Department of Emergency Medicine, Maine Medical Center, Portland, ME 04102, United States*
[e] *Emory University School of Medicine, Atlanta, GA 30307, United States*
[f] *University of Idaho, Moscow, ID 83844, United States*
[g] *Idaho Emergency Physicians, Meridian, ID 83642, United States*
[h] *Global Emergency Care Collaborative, Boston, MA, United States*

Received 3 April 2012; revised 8 June 2012; accepted 18 June 2012
Available online 30 August 2012

KEYWORDS

Task-shifting;
Non-physician clinicians;
Access to care;

Abstract The enormous shortage of health workers in sub-Saharan Africa (SSA) is a major contributor to the unacceptably high rates of morbidity and mortality in the region. This is especially true for patients whose illnesses and injuries require time-sensitive interventions. To address the crisis, a number of countries have utilized "task-shifting" in various health disciplines where they call

* Corresponding author at: Department of Emergency Medicine, University of Massachusetts Medical School, 55 Lake Ave North, Worcester, MA 01655, United States. Tel.: +1 401 439 4100.
E-mail addresses: benjaminmterry@gmail.com (B. Terry), mbisanzo@gmail.com (M. Bisanzo), mariah.mcnamara@gmail.com (M. McNamara), dreifuss.md@gmail.com (B. Dreifuss), chamberlain.stacey@gmail.com (S. Chamberlain), sara.w.nelson@gmail.com (S.W. Nelson), kylept@gmail.com (K. Tiemeier), typwaters@gmail.com (T. Waters), hhammerstedt@gmail.com (H. Hammerstedt).
Peer review under responsibility of African Federation for Emergency Medicine.

ELSEVIER Production and hosting by Elsevier

http://dx.doi.org/10.1016/j.afjem.2012.06.005

Cost-effectiveness;
Nurse specialists;
Midlevel providers

upon other cadres, often nurses, to assume new roles and responsibilities that are not traditionally within their scope of practice. This practice has been shown to increase access, to be cost-effective and of high-quality. A literature review was undertaken to better understand the implications of task-shifting on emergency medical care in Africa. This review demonstrates that, while task-shifting has been used effectively for specific emergency procedures in specialty fields such as obstetrics and surgery, to date there are no studies on the use of task-shifting to treat the acute, undifferentiated patient in SSA. Task shifting is a potential solution to help address the very limited access to emergency care across SSA, but requires further study to ensure effective implementation.

Abstract L'importante pénurie de travailleurs de la santé en Afrique sub-saharienne contribue de façon importante aux taux inacceptablement élevés de morbidité et de mortalité dans la région. Cela est surtout le cas pour les patients souffrant de maladies qui nécessitent des interventions urgentes. Pour remédier à la crise, un certain nombre de pays utilisent le "transfert des tâches" dans diverses disciplines de santé où il est fait appel à d'autres employés, souvent des infirmiers (ières), pour assurer de nouveaux rôles et responsabilités qui ne font pas partie traditionnellement de leur domaine d'activités. Cette pratique s'est révélée accroître l'accès, être d'un bon rapport coût-efficacité et d'une grande qualité. Une analyse documentaire a été menée afin de mieux comprendre les conséquences du transfert de tâches sur les soins médicaux d'urgence en Afrique. Alors que cette analyse montre que le transfert de tâches a été utilisé de manière efficace pour des procédures d'urgence spécifiques dans des domaines spécilalisés tels que l'obstétrique et la chirurgie, à ce jour il n'existe aucune étude sur l'utilisation du transfert de tâches afin de traiter des patients en soins de courte durée, aux symptômes indifférenciés en Afrique sub-saharienne. Le transfert de tâches est une solution possible afin d'aider à remédier à l'accès très limité aux soins d'urgence en Afrique sub-saharienne, mais nécessite une étude plus approfondie pour garantir une mise en œuvre efficace.

African highlights

- Sub-Saharan Africa faces 25% of the global burden of disease with 3% of the workforce.
- Due to lack of physicians, the proportional representation of nurses is high.
- Non-physician clinicians have had roles in Africa since the 1800's.

What's new?

- Many specialties have empowered nurses into new roles and responsibilities.
- NPC in these specialties have proven to be cost-effective providers of care.
- Task-shifting emergency care in sub Saharan Africa can provide increased access to quality care.

Introduction

There are many challenges in the development of acute care and emergency medical systems in Africa. The foremost of these challenges is the development of human resources with a broad skill set to provide effective care for acute illness and injury. Clinicians must be able to differentiate "sick" from "not sick", accurately diagnose diseases with time-sensitive interventions and efficiently and effectively carry out these interventions. In sub-Saharan Africa, there are simply too few physicians (and even fewer physicians trained in Emergency Medicine) to manage this patient volume. Hence, untrained and unprepared nurses often must shoulder the burden of these complex, undifferentiated and critical patients. One way to develop the human resources for quality emergency care is to recognize the specialty of Emergency Nursing and regional nursing organizations such as the Emergency Nurses Society of South Africa (ENSSA).[1] Another critical tool, already utilized in other fields of care, would be to develop a new cadre of non-physician clinicians who can assume the complex task of providing comprehensive emergency care in these resource-limited settings.

Background

The global human resource deficit in healthcare is pervasive. The World Health Organization recognized the critical importance of human capital in its 2006 World Health Report, *Working Together for Health*, which details the global health workforce crisis. There is a shortage of 4.6 million doctors, nurses, midwives and ancillary staff worldwide, with 2.4 million of these occurring in 57 "crisis" countries. While the

numerical shortage is highest in Southeast Asia, the proportional shortage is greatest in sub-Saharan Africa (SSA). As a result, SSA shoulders 25% of the world's disease burden, but only has 3% of the world's health workforce.[2]

Several factors contribute to the health workforce crisis in Africa. Almost half of the population of SSA is under the age of 14, making it the youngest region in the world.[3] Due to high rates of communicable diseases and malnutrition, children account for a large proportion of health care visits. Although there is also a large young adult population, poverty and lack of public funding for higher education have limited the opportunity of many of these individuals to join the healthcare workforce.

Meanwhile, SSA has seen a marked rise in its overall demand for healthcare services. The single greatest contributor to increased healthcare demand is the HIV/AIDS pandemic, however, factors such as urbanization, road traffic accidents and armed conflicts are also driving increased healthcare utilization. While the number of patients living with HIV/AIDS has increased, many providers have themselves been lost to the disease, with prevalence rates only slightly lower than the general population.[4] Programs such as the "3 by 5" initiative and the President's Emergency Plan for AIDS Relief (PEPFAR) provide life-saving antiretroviral therapy (ART), but will continue to require a massive workforce to implement.[5]

In addition to the overall shortage of workers, SSA faces a marked distributional imbalance of skills and responsibilities between the members of the healthcare team. Due to the absence of physicians, nurses are often left with the responsibilities of care without sufficient training. The changing demographics of wealthy Western nations are increasing the financial incentive for health workforce emigration, worsening the "brain drain" from low- and middle-income countries leading to a financial loss in SSA of over $2 billion/year.[6–8] Physicians respond to economic and career incentives by emigrating at a much higher rate than other providers.[9] This leaves a sharp decline in the number of physicians compared to nurses. The time and cost to train a physician is much higher than for nurses and midlevel providers. Non-physicians have been called upon to assume roles and responsibilities beyond those traditionally within their scope of practice. This process occurs both at a macro-level through healthcare policy and at a local level by individual providers and care organizations. It is collectively known as task-shifting.

Methodology

To better understand the implications of task-shifting on emergency medical care in Africa, the authors undertook a systematic review of the literature. PubMed was searched with variations of the terms "task shifting" AND "Emergency Medicine", OR "emergency care", OR "non-physician clinicians" AND "Africa". All results for the last 3 years were analyzed for subject and content. Google Scholar was also searched within the last 3 years using the term "task shifting Emergency Medicine". References from these articles and landmark papers were also included in the review.

Results

The PubMed search yielded 21 distinct publications on task-shifting. Google Scholar search terms produced 11,600 hits, of which the first 100 were reviewed for content and produced 28 relevant articles (Table 1). The literature on task-shifting in emergency care fell into a number of groups. The vast majority were observations or commentaries on field-specific utilization of task-shifting, such as HIV/AIDS care, emergency obstetric care, emergency surgical services, anesthesia, gastroenterology, mental health, and chronic diseases (e.g. diabetes or hypertension). The remainder was more of general reviews on the topic, editorials and policy statements. Notably, the authors were unable to identify a single article that examined the use of task-shifting to mid-level cadres in the care of the acute, undifferentiated patient in SSA.

Discussion

History

Task-shifting has a long history in Africa. As far back as the 1800's, local midlevel providers known as *officiers de santé* (health officers) were employed by the French.[10] Clinicians known as dressers and dispensers provided basic surgical and medical care, respectively, in Kenya in the 1920's. In some sub-Saharan countries, the concept of transferring care to non-physician clinicians (NPCs) has taken hold. As of 2007, a total of 25 of 47 countries in sub-Saharan Africa had cadres of non-physician clinicians.[11] Basic entrance requirements vary from completion of secondary school to university science or nursing degrees. Training programs are typically 2–3 years in duration and often include 1 year of practical internship, ranging in specialty from midwifery to orthopedics. In various countries, NPCs are known as clinical officers, health officers, medical assistants or physician assistants. The roles and responsibilities of these providers are determined by the individual Ministries of Health and aim to fill human resource gaps, either by treating narrow clinical topics, such as starting ART or alleviating the population burden on physicians by caring for less complex patients.

Non-physician clinicians in resource-rich settings

Resource-rich nations such as the United States, Australia and New Zealand (among others) have utilized provider cadres such as nurse practitioners (NP) and physician assistants (PAs) for over forty years to meet their own physician shortages. Research on the practice of these providers has shown that while they care for patients with more minor injuries and illnesses, PAs and NPs are able to provide a similar quality of care compared with their physician colleagues.[12] Facilities that use NPs and PAs have shorter wait times and reduced length of stay by increasing access to care.[13] In short, our colleagues around the world have shown that it is possible to develop an effective cadre of non-physician clinicians to help address health workforce shortages in the emergency department.

Benefits of task-shifting in emergency care

Access to care

Task-shifting has the potential to improve African acute and emergency care by vastly improving access to expert acute care

Table 1 Search results.

Source	Terms	Field	Number
PubMed	Task shifting AND Emergency Medicine	Obstetrics	1
PubMed	Task shifting AND emergency care	Obstetrics	5
PubMed	Task shifting AND emergency care	Review	1
PubMed	Task shifting AND emergency care	Anesthesia	1
PubMed	Non-physician clinicians AND Africa	HIV/AIDS	4
PubMed	Non-physician clinicians AND Africa	Obstetrics	2
PubMed	Non-physician clinicians AND Africa	Surgery	2
PubMed	Non-physician clinicians AND Africa	Gastroenterology	1
PubMed	Non-physician clinicians AND Africa	Hypertension, diabetes	1
PubMed	Non-physician clinicians AND Africa	Review	3
Google Scholar	Task shifting Emergency Medicine	HIV/AIDS	12
Google Scholar	Task shifting Emergency Medicine	Review	4
Google Scholar	Task shifting Emergency Medicine	Surgery	6
Google Scholar	Task shifting Emergency Medicine	Obstetrics	3
Google Scholar	Task shifting Emergency Medicine	Mental health	1
Google Scholar	Task shifting Emergency Medicine	Procedural sedation	1
Google Scholar	Task shifting Emergency Medicine	Anesthesia	1

providers, similar to how this concept has succeeded in other specialties. In the scale-up of anti-retroviral therapy in Malawi, trained non-physician clinicians were able to start 130,488 patients on life-saving ART in 3 years. When task-shifting was discontinued in Lusikisi, South Africa, enrollment for ART plummeted.[14] Emergency obstetric care would be nearly impossible in Malawi, were it not for task-shifting to midlevel cadres, where 88% of cesarean sections were performed by clinical officers, compared to only 12% by doctors. A similar analysis in Mozambique showed that 92% of all major obstetric/gynecologic surgeries were conducted by NPCs.[15]

Similarly, in many areas of SSA, access to general surgery would also be limited were it not for task-shifting to NPCs and generalist physicians. As of 2009, almost half of all countries in sub-Saharan Africa utilized NPCs for minor surgeries. Even when a physician is available to operate, these doctors rarely have undergone advanced or specialty surgical training. General surgery in Uganda, for instance, (emergency or elective) is regularly performed by physicians without surgical specialist training, including over 5000 operations annually among five district hospitals.[15]

Quality of care

Access to care, of course, means little if the care provided is not of high quality. Non-physician clinicians, with a few exceptions, have demonstrated their value to the healthcare system with outcomes that rival those of physicians. Post-operative cesarean outcomes by clinical officers in Malawi were comparable to medical officers in both immediate and 24-h condition, with respect to pyrexia, wound infection, wound dehiscence, need for re-operation or maternal death.[16] Surgically-trained NPCs in Mozambique also produced similar patient outcomes after emergency obstetric surgery. A multicenter study including sites in Southeast Asia, South America and sub-Saharan Africa, examined the compliance of a diverse set of NPCs to the integrated management of childhood illness and found the same quality of care across the different health worker categories.[17] Work in Lusikisi, South Africa and Thyolo, Malawi demonstrated improved ART outcomes with the use of non-physician clinicians.[18,10] Nurse-led protocols even improved management of chronic diseases such as hypertension and diabetes.[19]

To be clear, while NPCs provide high quality care in resource-poor settings, they are not meant to replace their physician colleagues. As was shown in resource-rich settings, NPCs are best utilized when given low- to medium-complexity patients or when carrying out specific tasks. However, due to physician shortages, in many areas NPCs may be the only clinicians available to provide acute care. As SSA physician specialties (such as Emergency Physicians) and NPCs develop in parallel, much thought will need to be given to the roles of EPs and NPCs, including their training, management and oversight. One possibility would be to use the WHO Emergency Triage Assessment and Treatment algorithm to determine which patients would be eligible for exclusive care by NPCs and which would need EP or other physician oversight. Delegation of triage at Emergency Centres would need to be closely examined, since different cadres of health care workers have shown variable reliability to established triage scales.[20]

Cost effectiveness

Arguments for applying task shifting to emergency care that cite improved outcomes and improved access will translate into policy changes more quickly if the care proves to also be more cost-effective. Research on task shifting in other fields has shown cost savings accompanying the other benefits of task shifting. African NPCs require a lower cost of training and time of training than physicians. Surgical NPCs in Mozambique are just as effective and their operations cost only one quarter of that of a physician surgeon.[21] The cost of training for an NPC is between $3000–6000 compared to $20,000–60,000 to train a physician, and NPCs are far more likely to continue practicing in the country, which provides a greater return on investment.[11]

Challenges

Retention of healthcare workers

The retention of healthcare workers is one of the three-pronged efforts in the WHO's "Treat, Train, Retain"

initiative. Midlevel providers often come from rural areas, train, and then work at district hospitals. A study in Mozambique found 90% of NPCs still working at the same hospital seven years later, while the vast majority of doctors had either left the district or the country entirely.[22] Although this retention of providers has a clear positive impact on a community, candidates for future training may lose interest if they perceive a lack of advancement over time. National health policymakers walk a moral tightrope trying to walk the line between improving local care and restricting the opportunities for NPCs by limiting their potential for career advancement, recognition and remuneration.

Knowledge acquisition and cadre development

The main challenge confronting proponents of task-shifting in emergency care is to impart proper knowledge and skills to practice emergency medicine by developing appropriate training methods, adequate supervision, and an effective means to continually evaluate and regulate independent practitioners. NPCs must be satisfied with the nature of their work, receive adequate compensation and be afforded professional respect. They must also be able to retain their skills after training. NPCs in Mozambique were evaluated after only a two-week ART in-service training program and were found to correctly diagnose the WHO clinical AIDS stage in only 37.6% of patients. They correctly managed the combined criteria of staging, cotrimoxazole prophylaxis, ART, opportunistic infections and adverse drug reactions in only 10.6%.[23] As a result of this study, the Ministry of Health suspended the training program until a complete evaluation could be conducted. Setbacks like these should not cause to abandon the principle of achieving a better skill-responsibility distribution among providers, but rather serve as a call for perseverance and thoughtful re-examination.

In considering the curriculum for emergency care non-physician clinicians, academics and governments alike must keep in mind the unique nature of emergency care. It is comprised of both complex decision-making, such as is required for the initiation of ART or the management of childhood illnesses, and also the completion of specific tasks like procedural sedation, lumbar puncture, paracentesis and fracture reduction. Training should therefore utilize pedagogical tools that foster critical thinking as well as ensure strict adherence to proper procedure. There is emerging evidence that some of these skills such as procedural sedation can be successfully taught, but it remains to be seen if all components of emergency care can successfully be incorporated into a ''task shifting'' program.[24] A group of Emergency Physicians known as the Global Emergency Care Collaborative (GECC) working in Uganda since 2007 have been training a new cadre of advanced practice nurses known as Emergency Care Practitioners (ECPs). Clinical outcomes data from this program are currently under evaluation.

Conclusions

In many places in Africa, emergency care is already being practiced by non-physician clinicians. Nurses initiate antibiotics for pediatric pneumonia. Clinical officers order quinine for cerebral malaria. As emergency care systems develop, all cadres must be nurtured to their full potential. Financial compensation must reflect the degree of training required for providing quality acute and emergency care as well as its stressful nature. Professional respect should be afforded to emergency NPCs, as it is for other midlevel cadres. This will require support and a long-term commitment from all stakeholders, including administrators, local health officials, and medical educators. Finally, it will require coordinating with credentialing and regulatory bodies such as universities and Ministries of Health. The health outcome gains of task-shifting have been demonstrated across specialties. The time has come for acute care and emergency services to utilize this valuable tool.

Authors' contribution

B.T. wrote this article. M.B. and M.M. were members of the core editing team. B.D., S.C., S.W.N., K.T. and H.H. were part of the general editing team. T.W. provided research assistance. B.T. takes responsibility for the paper as a whole.

Conflict of interest statement

No actual or potential conflict of interest exists between the authors and any means of financial gain in relation to this article.

Appendix A. Short answer questions

Test your understanding of the contents of this original paper (answers can be found at the end of the regular features section)

1. In the 2006 World Health Report, ''Working Together for Health'', what is the estimated global health workforce shortage?
   a. Zero
   b. 1 million
   c. 2.4 million
   d. 4.6 million
   e. 9.7 million
2. What is the average financial loss in sub-Saharan Africa due to health workforce emigration (or ''brain drain'')?
   a. $2 million/year
   b. $200 million/year
   c. $2 billion/year
   d. $4 billion/year
   e. $20 billion/year
3. True or false: Resource-rich nations such as Australia and the United States have sufficient physicians to see all acute and emergency patients and have no use for ''task shifting''?
   a. True
   b. False

References

1. Brysiewicz P. Emergency nurses: an essential component of emergency care in Africa. *Afr J Emerg Med* 2011;**1**(1):3–4.
2. World Health Organization. *Working together for health*. The World Health Report 2006. ISBN 978 92 4 156317 8.
3. Asford Lori. *Africa's youthful population: risk or opportunity*. Washington, D.C.: Population Reference Bureau; 2007.

4. Shisana O, Hall EJ, Maluleke R, Chauveau J, Schwabe C. HIV/AIDS prevalence among South African health workers. *S Afr Med J* 2004;**94**(10):846–50.
5. Hanefeld J, Musheke Maurice. What impact do Global Health Initiatives have on human resources for antiretroviral treatment roll-out? A qualitative policy analysis of implementation processes in Zambia. *Hum Resour Health* 2009;**7**:8.
6. Mills E, Kanters S, Hagopian A, Bansback N, Nachega J, Alberton M, et al.. The financial cost of doctors emigrating from Sub-Saharan Africa: human capital analysis. *Br Med J* 2011;**343**:7031.
7. Kumar P. Providing the providers – remedying Africa's shortage of health care workers. *N Engl J Med* 2007;**365**:25.
8. Serour G. Healthcare workers and the brain drain. *Int J Gynecol Obstet* 2009;**106**:175–8.
9. Stilwell B, Diallo K, Zurn P, Vujicic M, Adams O, Dal Poz M. Migration of health-care workers from developing countries: strategic approaches to its management. *Bull World Health Organ* 2004;**82**:8.
10. Callaghan M, Ford N, Schneider H. A systematic review of task-shifting for HIV treatment and care in Africa. *Hum Resour Health* 2010;**8**:8.
11. Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. *Lancet* 2007;**370**(9605):2158–63.
12. Wilson A, Zwart E, Everett I, Kernick J. The clinical effectiveness of nurse practitioners' management of minor injuries in an adult emergency department: a systematic review. *Int J Evid Based Healthcare* 2009;**7**:3–14.
13. Hoyt KS, Proehl JA. Nurse practitioners in the emergency care: filling the workforce gap. *Adv Emerg Nurs J* 2010;**32**(4):285–8.
14. Zachariah R, Ford N, Philips M, et al.. Task shifting in HIV/AIDS: opportunities, challenges and proposed actions for Sub-Saharan Africa. *Trans R Soc Trop Med Hyg* 2009;**103**(6):549–58.
15. Chu K, Rosseel P, Gielis P. Surgical task shifting in Sub-Saharan Africa. *PLoS Med* 2009;**6**:5.
16. Chilopora G, Pereira C, Kamwendo F, et al.. Postoperative outcome of caesarean sections and other major emergency obstetric surgery by clinical officers and medical officers in Malawi. *Hum Resour Health* 2007;**5**:17.
17. Huicho L, Scherpbier R, Nkowane AM, Victora CG. How much does quality of child care vary between health workers with differing durations of training? An observational multicountry study. *Lancet* 2008;**372**(9642):910–6.
18. Bemelmans MVan, Den Akker T, Ford N, et al.. Providing universal access to antiretroviral therapy in Thyolo, Malawi through task shifting and decentralization of HIV/AIDS care. *Tropical Med Int Health* 2010;**15**(12):1413–20.
19. Lekoubou A, Awah P, Fezeu L, Sobngwi E, Kengne AP. Hypertension, diabetes mellitus and task shifting in their management in sub-Saharan Africa. *Int J Environ Res Public Health* 2010;**7**(2):353–63.
20. Twomey M, de Sa A, Wallis LA, Myers Jonathan. Inter-rater reliability of the South African Triage Scale: assessing two different cadres of health care workers in a real time environment. *Afr J Emerg Med* 2011;**1**(3):113–8.
21. Fulton B, Scheffler R, Sparkes S, Auh EY, Vujicic M, Soucat A. Health workforce skill mix and task shifting in low income countries: a review of recent evidence. *Hum Resour Health* 2011;**9**:1.
22. Pereira C, Cumbi A, Malalane R, Vaz F, McCord C, Bacci A, et al.. Meeting the need for obstetric care in Mozambique: work performance and histories of medical doctors and assistant medical officers trained for surgery. *BJOG* 2007;**114**:1530–3.
23. Brentlinger P, Assan A, Mudender F, Ghee A, Torres JV, Martinez PM, et al.. Task shifting in Mozambique: cross-sectional evaluation of non-physician clinicians' performance in HIV/AIDS care. *Hum Resour Health* 2010;**8**:23.
24. Bisanzo M, Nichols K, Hammerstedt H, Dreifuss B, Nelson SW, Chamberlain S, et al.. Nurse-administered ketamine sedation in an emergency department in rural Uganda. *Ann Emerg Med* 2011;**59**:4.