



Non-physician Clinicians in Sub-Saharan Africa and the Evolving Role of Physicians

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Abstract

Responding to critical shortages of physicians, most sub-Saharan countries have scaled up training of non-physician clinicians (NPCs), resulting in a gradual but decisive shift to NPCs as the cornerstone of healthcare delivery. This development should unfold in parallel with strategic rethinking about the role of physicians and with innovations in physician education and in-service training. In important ways, a growing number of NPCs only renders physicians more necessary – for example, as specialized healthcare providers and as leaders, managers, mentors, and public health administrators. Physicians in sub-Saharan Africa ought to be trained in all of these capacities. This evolution in the role of physicians may also help address known challenges to the successful integration of NPCs in the health system.

Keywords: Physician Assistants, Professional Delegation, Human Resources for Health, Rural Health Services, Developing Countries, Emigration and Immigration, Delivery of Healthcare, Medical Education, Ethics

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A decade ago, sub-Saharan Africa accounted for 24% of the global disease burden, but was served by only four percent of the global health workforce.¹ This shortage has led the World Health Organization (WHO) to support the training of new cadres of health workers, including non-physician clinicians (NPCs).² In different sub-Saharan countries, NPCs are known as clinical officers, health officers, physician assistants, nurse practitioners, nurse clinicians, or associate clinicians. We shall use the definition of NPCs as health workers who have fewer clinical skills than physicians but more than nurses.³ Since this definition is based on skills not on formal training, nurses with added training for or rich experience in delegated HIV care may also count as NPCs; so may physicians' assistants or surgical clinical officers with shorter training than nurses, if they have "more" clinical skills. Despite shorter training than that of physicians, NPCs are capable of many of the diagnostic and therapeutic tasks of physicians. In many areas, they already manage regular clinic visits, Caesarian sections, hernias, closed fracture care, and amputations.²⁻⁷

This development in NPC deployment should unfold in parallel with strategic rethinking about the role of physicians and with critical innovations in physician education and in-service training. Many sub-Saharan countries have recently scaled up NPC training.^{3,7-11} In 2007, the reported number of NPCs already equaled or exceeded that of physicians in nine sub-Saharan countries.³ In 2009, 84% and 92% of cesarean sections, obstetric hysterectomies, and laparotomies for ectopic pregnancy in Tanzania and Mozambique (respectively) were already performed by NPCs.¹² In 2010, NPCs were recognized in 47 of the 54 African countries.¹³ In 2014, researchers were unable to find a single Ethiopian health facility that had not yet shifted any HIV-related clinical task to

NPCs.¹⁴ Currently, many countries in the region have human resources for health (HRH) strategic plans that commit to NPC training, for example, in the complex treatment of multi-drug resistant tuberculosis.^{15,16} This may signal that NPCs' deployment has finally gained full acceptance by local health sector leaders.

The combined effect of the physician and nursing brain drain to urban, for-profit, and international settings and the boost in NPC training is a quiet but compelling transformation in the composition of sub-Saharan Africa's health workforce. In the new health system, NPCs perform a significant portion of diagnostic and therapeutic tasks traditionally performed by physicians at the primary and secondary health facility level. The importance of this transformation in health workforce composition cannot be overstated. Health services to some of the world's most vulnerable populations are increasingly delivered by NPCs, in specialty areas as diverse as HIV prevention and treatment, obstetrics care, non-communicable diseases, and even surgery.

WHO recommendations and a growing body of research concur that NPCs can achieve impressive patient outcomes, often as good as physicians.^{2,4-7,14,17} Training NPCs is less time-consuming and less expensive than training physicians, while employing NPCs costs less than employing physicians. And crucially, NPCs tend to remain in rural and underserved settings longer and in greater numbers than physicians.¹⁸ Most HRH experts agree, however, that several important challenges must be addressed to maximize the effectiveness of NPCs in the new health system, including:

1. Paucity of standardized decision-making algorithms and simplified drug regimens (which NPCs typically need more than physicians do) and of curricula and teaching materials tailored to NPCs,^{11,12,19}

2. NPCs' difficult work conditions, limited career development opportunities, and insufficient professional status and recognition,^{8,17,20-24}
3. Opposition to NPCs from mainstream health professional societies,^{3,8,23,25} and occasional conflicts between NPCs and other health workers^{11,17,23,26} and,
4. Limited availability of dedicated faculty and teaching health facilities for NPC training.

These HRH experts propose important interventions to address these challenges,^{2,4,17,19,21,22,27,28} which focus primarily on improving NPCs' own training and work conditions, for example by increasing NPC salaries and occupational safety.^{2,12,17} But NPCs are only one component of a broader health service delivery chain, which comprises other health workers such as physicians, nurses, midwives, and community health workers. All health workers must work together to deliver high quality health services. Major changes to one component of such an integrated system require complementary adaptations elsewhere.

This editorial explores the evolving role of physicians in sub-Saharan Africa consequent to the growing utilization of NPCs (as well as other mid-level health workers). Even in a predominantly NPC-based health system, physicians remain highly necessary—although sometimes in non-traditional roles. Therefore, the editorial outlines a set of competency domains and new tasks for physicians in sub-Saharan health systems. All operate under the assumption that the majority of diagnostic and therapeutic tasks at the primary and secondary health facility level will be performed by NPCs. It also proposes ways in which sub-Saharan training programs can support physicians in their new roles. Finally, it points out how such training for physicians could help address HRH experts' challenges to the successful integration of NPCs in sub-Saharan health systems.

Physicians' Roles in a New Healthcare Delivery System

In an NPC-based health system, physicians retain critical clinical roles. As an illustration, in HIV care, physicians remain necessary for the initiation of second-line antiretrovirals, treatment of severe opportunistic infections, management of severe medication side effects, and in several aspects of

pediatric HIV care.² Accordingly, HIV care "minimum teams" in sub-Saharan countries continue to include a physician.²⁹ In other specialty areas, physicians are similarly needed to address advanced medical conditions—examples include decompensated heart failure and diabetic ketoacidosis—and to perform major surgical interventions such as open abdominal surgeries.^{4,12} Lastly, physicians must also mentor, supervise, and serve as consultants to NPCs and other mid-level health workers on complex clinical cases.^{2,4,20,30,31} In several sub-Saharan countries and for multiple types of surgery, for instance, NPCs perform as well as qualified surgeons within the limited scope of their training or skill level, but only with strong mentoring and supervision by physicians.^{3,12}

Task-shifting to NPCs enables health systems to function with fewer physicians, but it also creates non-clinical tasks for physicians. In NPC-based health systems, physicians find themselves leading and managing multidisciplinary health teams comprising NPCs, primary care nurses, allied health professionals, community health workers, and even non-clinical staff, such as social workers.^{32,33} Where physicians are found (they are often missing from remote rural areas), increasingly one of their main tasks is to mentor and supervise NPCs at the primary and secondary health facility level—and even in some tertiary health facilities (such as Mulago Hospital in Uganda, as one of us experienced in person). Integrated and interdependent health service delivery chains are an imperative everywhere,^{32,33,34,35} but in sub-Saharan Africa, they take on special importance.

The [Table](#) outlines a set of competency domains for physicians in health systems where some of their traditional diagnostic and therapeutic tasks have been shifted to NPCs. Each domain is named after one of WHO's health system strengthening building blocks.^{36,37} Within each competency domain is listed a series of non-clinical tasks performed by physicians, the sum of which helps define the additional new roles for physicians in NPC-based health systems. The [Table](#) should be taken as a first approximation of a framework that further research should assess and improve. It is not entirely complete. In particular, important tasks might be missing, and the relationship and division of labor between physicians and NPCs may need to be nuanced further, as the

Table. Potential New Competency Domains and a Model of Associated New Tasks for Physicians in NPC-Based Health Systems

Competency Domain	Tasks
Health service delivery	<ul style="list-style-type: none"> • Clinical consultation on complex cases • Leadership and management of clinical programs and multidisciplinary health teams
Health workforce capacity building	<ul style="list-style-type: none"> • Mentoring and clinical supervision at point of care of NPCs and other health workers • Health worker training and evaluation
Health information systems	<ul style="list-style-type: none"> • Development and implementation of M&E and QI plans for clinical programs • Research and scholarship in health service delivery • Reporting about disease trends and effectiveness of public health interventions
Access to essential medical products and technologies	<ul style="list-style-type: none"> • Program management
Financing	<ul style="list-style-type: none"> • Advocacy and fund-raising • Program management: costing analysis and tracking
Leadership and governance	<ul style="list-style-type: none"> • Strategic and analytical thinking • Team-building, communication, task delegation, decision-making, problem solving, work-place dynamics, liability • Program management: planning, organization, coordination

Abbreviations: NPC, non-physician clinician; M&E, monitoring and evaluation; QI, quality Improvement.

Sources: References [36](#), [37](#), and authors' suggestions.

evidence basis grows. For example, some highly-experienced NPCs might be able to perform nearly all of the clinical tasks herein assigned to physicians, or even mentor and supervise physicians in some of those tasks. However, as a general rule across specialty areas, it would be unsafe to expect NPCs to perform all clinical tasks without physician engagement and patients continue to expect such engagement.

A fair concern about a physician workforce skilled in leadership and in team and program management is that some physicians might abandon their clinical roles altogether or use their newly acquired skills to move out of the health sector. However, the larger brain drain of physicians occurs from clinical roles in the public sector to similar roles in the private for-profit or international health sectors.³⁸ Aligning and integrating the skills of physicians to those of NPCs and other mid-level health workers may adjust expectations and potentially reduce physicians' frustration-related burnout, facilitating their retention in underserved areas.³⁹

Training Physicians for Their New Roles

Training programs in sub-Saharan Africa should formally and fully prepare physicians for their new roles, including their non-clinical tasks, in an NPC-based health system.^{8,32,40}

In the new system, physicians will often function in these new roles, in addition to their clinical role, immediately upon their graduation.^{8,41} Curricula and training modules should build capacity in leadership and team management, program management and implementation, health service delivery research (which includes operational research, monitoring and evaluation, and impact evaluation), and other pertinent pedagogical areas. To foster synergy and cooperation with NPCs and other members of multidisciplinary health teams, a significant portion of physician training ought to take place together with NPC trainees and other health workers in training. Medical schools like Jimma and Gondar in Ethiopia, the School of Medicine at the University of Rwanda, and the Faculty of Medicine at Mbarara University in Uganda already emphasize inter-professional training as a way to prepare future health workers for the complexities of delivering health services in remote rural areas and specifically for interacting effectively with cadres different than one's own.

With notable exceptions (including also medical schools in Makerere in Uganda, Ibadan in Nigeria, and Accra in Ghana, among others), sub-Saharan physician training has not yet broadly transformed itself to reflect physicians' future roles in a NPC-based health system.^{11,23,41,42} Partly as a result, among medical and nursing students in sub-Saharan Africa, "the role of health managers is not as valued as the roles of surgeon, specialist, or clinical nurse"⁴¹ However, curricula whose near-sole focus is the acquisition of clinical skills are now less helpful than they used to be. Alongside clinical skills, which remain critical, curricula in pedagogical areas such as the ones mentioned above would keep physician training aligned to the actual tasks awaiting medical graduates in sub-Saharan Africa's poor and underserved areas.^{32,33}

The new pedagogical areas could be taught as longitudinal modules over the entire course of medical school, for instance, by addressing complex health service delivery challenges in multidisciplinary health teams encompassing both medical and NPC trainees. Fresh medical graduates

will not be consummate managers (any more than they will immediately be specialists in any one area of medicine) but some substantial preparation for the public health sector and health service delivery chains of the future seems essential. Such preparation warrants some reduction in coursework that is less relevant to health service delivery in resource-poor settings than it is for resource-rich settings domestically and abroad.⁴³

To be fair, not all medical graduates will end up mentoring and supervising NPCs. But lack of training is usually worse than redundant training; and medical graduates in sub-Saharan Africa will often embark on leadership and management roles immediately or shortly after graduation.^{8,41} Medical schools need to prepare future physicians to play these roles effectively. And they should also prepare them to be excellent clinicians for local underserved populations, because in a NPC-based health system physicians retain a significant clinical role.

Positive Impact on Non-physician Clinician Functioning?

The evolution in physicians' roles and training may also turn out to help address three out of the four challenges noted by HRH experts to NPC success, which we mentioned earlier:

1. Training physicians to play new roles in an NPC-based health system could foster strategic rethinking regarding the roles of NPCs in health service delivery, on the parts of trainers and trainees alike. That could accelerate the development of standardized curricula and training modules for NPCs.
2. Greater emphasis on inter-professional collaboration and team building in physicians' education and in-service training may help medical graduates and their trainers relate to NPCs and acknowledge the centrality of NPCs in the new health system. That recognition by physicians could build support for improving NPCs' work conditions.^{8,22,23}
3. Such recognition among medical graduates and their trainers may eventually reach physicians' professional societies and reduce resistance to NPCs there. Training physicians, NPCs, and other health workers together for future collaboration could also help reduce future friction between all.

Conclusion

Medicine has recreated itself many times over as diseases, technologies, administrative models, and roles of physicians and other health workers have evolved. The justification for these adaptations has always been the need to foster patients' health interests in changing circumstances. Such adaptation is again called for, so that physicians in underserved settings in sub-Saharan Africa can continue to promote patients' interests, within a changing framework for health service delivery. Large-scale plans to train more physicians in sub-Saharan Africa, such as the Human Resources for Health Program in Rwanda and the Medical Education Partnership Initiative, should aim not solely to increase the quantity of graduates, but also to model their training to the emergence of NPC-based health systems. Such transformation in physician training may also turn out to improve the effectiveness and integration of NPCs within the health service delivery chain of remote rural areas in sub-Saharan Africa. However, since

physicians remain necessary in clinical and non-clinical roles, the drive to train more of them is warranted, even in NPC-based health systems.

Researchers should characterize more precisely the ideal division of labor in sub-Saharan and other underserved settings between physicians, NPCs, nurses, and other health workers and administrators. Prospective studies of pilot training programs are one way forward. Meanwhile, physician training should already start to prepare physicians for this shift of focus.

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Ethical issues

Not applicable.

Competing interests

The authors declare that they have no conflict of interests related to this article.

Authors' contributions

NE wrote the first draft. All authors had full access to all the sources in the study, and participated in the conception and design of the study, analysis and interpretation of data, and revision of the manuscript for important intellectual content. All authors approved the final version.

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