

SOUNDING BOARD

Rapid Expansion of the Health Workforce in Response to the HIV Epidemic

Badara Samb, M.D., Ph.D., Francesca Celletti, M.D., Joan Holloway, M.A.,
Wim Van Damme, M.D., Ph.D., Kevin M. De Cock, M.D., and Mark Dybul, M.D.

The World Health Organization (WHO) estimates that there is now a global deficit of more than 4 million trained health workers. The shortages in health workers are critical in 57 countries, mostly in sub-Saharan Africa and parts of Asia. The situation is further exacerbated by the direct effect of the human immunodeficiency virus (HIV) on health workers in resource-constrained countries in which the disease is epidemic. Poor working conditions and low pay conspire with the risks of occupational transmission and the stress of working in communities devastated by the HIV epidemic to drive up rates of attrition. Many health workers resign; others migrate to better jobs abroad or to the private sector or leave health work altogether. In countries with the highest rates of HIV, leading causes of attrition are the morbidity and mortality caused by HIV itself. In Botswana, 17% of the health workforce died from diseases related to AIDS from 1999 to 2005.¹

In a vicious circle, the epidemic fuels the crisis in the health workforce at the same time that the shortage of health workers presents a major barrier to preventing and treating the disease. In Malawi, the number of people living with HIV/AIDS was 7435 per doctor, according to 2004 figures. By comparison, there were nearly two doctors per person living with HIV/AIDS in the United States and in the United Kingdom (Table 1).

In June 2006, at the High-Level Meeting on HIV/AIDS of the United Nations General Assembly, member states agreed to work toward the goal of “universal access to comprehensive prevention programmes, treatment, care and support” by 2010. This ambitious goal has galvanized governments and international agencies into action and is already bearing fruit in terms of increased resources and political commitment. But the goal cannot be reached without a strength-

ening of health care systems and a significant expansion of the health workforce.

The urgency of the situation, especially in many African countries, has prompted the WHO to coordinate a global effort to strengthen and expand the health workforce by addressing both the cause and the effects of HIV in health workers. Representatives from health ministries, professional associations, academic institutions, civil organizations, and United Nations organizations have formed a partnership to implement a plan of action called “Treat, Train, Retain.” The plan aims to prevent HIV among health workers and to treat those who are infected, to expand the workforce by training new people and by making more efficient use of the current pool of human resources for health, and to retain skilled staff.

DEMOGRAPHIC SHIFT AMONG HEALTH WORKFORCE

Possibly the most challenging imperative to expand the health workforce is the need for “task shifting,” the process of delegation in which tasks are moved, where appropriate, from more to less specialized health workers. Reorganizing the demographic characteristics of the health workforce in this way allows more efficient use of available human resources and quickly expands the overall human resource pool. Adding to the skill set of existing cadres and providing training to enable new cadres to perform clearly delineated tasks can be done in a matter of months rather than the years it takes for new doctors and nurses to complete their professional training. The term “task shifting” is new, but a long history of such practices outside the delivery of HIV-related services provides evidence of the potential efficacy of the model.

One of the earliest and most systematic stud-

Table 1. Numbers of Doctors, Nurses, and People Living with HIV/AIDS in Selected Countries.

Country	Doctors per 100,000 Population	Nurses per 100,000 Population	People Living with HIV/AIDS	Total Population of Country	People Living with HIV/AIDS per 100,000 Population	People Living with HIV/AIDS per Doctor	People Living with HIV/AIDS per Nurse
	<i>no.</i>		<i>no. (thousands)</i>			<i>no.</i>	
Malawi	1	26	900	12,105	7,435	7435	286
Mozambique	2	21	1300	18,863	6,892	3446	328
Zimbabwe	6	54	1800	12,835	14,024	2337	260
Tanzania	2	37	1600	36,977	4,327	2164	117
Rwanda	2	21	250	8,387	2,981	1490	142
Zambia	7	113	920	10,812	8,509	1216	75
Swaziland	18	320	220	1,077	20,427	1135	64
Botswana	29	241	350	1,785	19,608	676	81
Uganda	5	54	530	26,699	1,985	397	37
South Africa	69	388	5300	45,026	11,771	171	30
Cambodia	16	61	170	14,144	1,202	75	20
Thailand	30	162	570	62,833	907	30	6
Brazil	206	52	660	178,470	370	2	7
United States	256	937	477	295,410	161	0.6	0.1
United Kingdom	230	1212	83	59,479	138	0.6	0.1

ies of task shifting was undertaken during the 1970s and 1980s in the Democratic Republic of Congo (then Zaire), where shortages of fully trained health workers made it necessary to use auxiliary personnel in health care.² The conclusions of the evaluation by the Kasongo project were that doctors could delegate standardized tasks to auxiliary workers with no reduction in the quality of the task performed and that, in some cases, such delegation proved to be work-enhancing.

Task substitution of one kind or another within the health team, from medical doctors to non-physician clinicians, has been introduced in some countries to enhance the quality and reduce the cost of care, rather than as an emergency response to scarcity. Recent years have seen nurses empowered to prescribe health interventions and commodities that would previously have been the responsibility of a medical doctor. This experience is well documented and is now common practice in some high-income countries like the United Kingdom, the United States, and Australia.³⁻⁶

Research to assess the quality of care, accep-

tance by patients, and treatment outcomes has been conducted in both high-income and low-income countries and confirms that appropriately trained and supervised lower-level cadres are not only capable of performing delegated tasks but may even perform them better than physicians do.^{3-5,7} Reviewing primary care settings in the United Kingdom, Horrocks and colleagues found that patients were more satisfied with nurse practitioners, who achieved more compliance with treatment recommendations by patients than did doctors. In most other settings, outcomes were equivalent.⁵ For example, nurses in the Democratic Republic of Congo have routinely performed cesarean sections with no significant difference in maternal and neonatal outcomes.⁸

Cost comparisons of various delivery models have not been systematic. One U.S. study by Wilson and colleagues showed that although nurse practitioners and physician assistants earned less than physicians and were cheaper to train, their consultations were longer and they ordered more tests than doctors.⁹ However, Dovlo reviewed evidence from Mozambique, Kenya, and Ghana showing that there were considerable cost sav-

ings in terms of training of health workers as well as costs (to clients) of consultations.¹⁰

EXPANSION OF COMMUNITY INVOLVEMENT

The process of delegation can be further extended from health professionals to community members. In many settings today, health care is being delivered (of necessity) by a variety of persons with little or no formal medical training. The broad consensus of the recent literature is that this type of delegation to nonprofessional cadres, often referred to as community health workers, can have a positive effect on health outcomes.¹¹⁻¹³ For example, rapid diagnostic tests for malaria were accepted and easily used by community health workers in the Philippines, resulting in timely detection and the avoidance of overtreatment.¹⁴ Similar examples of successful community involvement in the directly observed provision of tuberculosis therapy can be found in several countries, including Zambia, South Africa, Malawi, Bangladesh, India, Colombia, and Bolivia.¹⁵

Studies have sought to systematically compare the delivery of services by community health workers with the traditional medical model. One review of 43 studies found that programs employing lay health workers showed greater efficiency in certain interventions, such as immunization, but not in other services.¹⁶ Other studies have concluded that lay health workers can achieve better outcomes for patients at considerable cost savings, as compared with clinic-based care.¹¹

Models of HIV services have been well described by Behforouz and colleagues, who showed that effective HIV/AIDS care can be provided by family or community members either as volunteers or in paid positions.¹⁷ A recent review confirmed that although current programs to provide antiretroviral therapy are heavily dependent on physicians, other types of providers are already playing a significant role in tasks such as assessing eligibility for antiretroviral therapy, initiating treatment, assessing toxicity or lack of response to therapy, and adherence support.¹⁸ In some countries, it is common for clinical officers or medical assistants to perform the bulk of treatment-related tasks — for example, clinical officers in Kenya, Ethiopia, and Malawi are allowed to prescribe antiretroviral therapy.¹⁹ In Zambia,

legislative barriers that prevent nurses from prescribing antiretroviral therapy are currently being reviewed.²⁰

MAINTENANCE OF THE QUALITY OF CARE

Although such programs are in their early days, there is evidence of success. In South Africa, care models that shift many medical tasks to nurses were found to be feasible, acceptable to patients, and potentially more affordable. Moreover, after 6 months of follow-up, outcomes such as virologic suppression, adherence, and retention of patients at sites with doctors were similar to those at sites without doctors where there was adequate supervision.²¹ Also in South Africa, community members called adherence counselors have been trained in a wide range of supporting roles, including counseling and testing, treatment adherence, collection and collation of statistics, and defaulter tracing. In this decentralized program, remote clinics outperformed the hospital in the retention of patients. This result was attributed to the close relationship between the adherence counselors and patients at the village level.²²

Marston and colleagues have reported on the administration of antiretroviral therapy in an urban slum in Nairobi, Kenya, in which midlevel providers offered simplified, standardized regimens and monitored patients clinically and with basic laboratory tests. The response to such therapy in this severely resource-constrained setting was similar to that seen in industrialized countries.²³

There is also evidence from high-income countries that alternative models can deliver equivalent or even superior service to traditional medical models. Wilson and colleagues reviewed the quality of HIV care in the United States and found that nurse practitioners and physician assistants delivered better-quality HIV care (including antiretroviral therapy) than that provided by nonspecialist physicians. The study suggested that the key to the success of such programs lay in their high levels of experience and focus on a single disease.⁹

In sum, there is growing consensus that task shifting, in its various forms, represents a promising strategy to strengthen the health workforce

to deliver HIV services.¹⁸ However, if this strategy is to be implemented in a systematic and widespread way, there is much work to be done.

POLITICAL AND FINANCIAL
COMMITMENTS

Adopting new models for the delivery of health services requires political and financial commitment. Governments, as well as international and bilateral agencies, will need to recognize and allow systems that train and deploy nonphysicians, including community-level workers and patients living with HIV/AIDS, in health care delivery. Regulatory frameworks that enable task shifting to take place, while also providing protection for both health workers and patients, must be put in place in locations where such services do not exist. Countries will need the capacity to train and deploy large numbers of additional cadres, and credentialing systems must be devised and implemented to ensure the quality of care.¹⁶ Such changes will have significant implications for already overstretched training institutions in many countries. The need for good management, supervision, and ongoing support, which are essential factors in the successful implementation of task shifting, also poses challenges to institutional capacity.

Task shifting uses a public-health model of service delivery that maximizes the role of primary health care and community-led care. This model will require the development of standardized protocols, including simplified drug regimens that can realistically be administered by less highly trained professional care workers and nonprofessional community members.

Above all, task shifting for HIV services must be aligned with the broader strengthening of health systems if it is to prove sustainable. In countries most affected by the HIV epidemic, it may be appropriate to develop new cadres of health workers specifically for the delivery of antiretroviral therapy; in others, it may be more appropriate to integrate HIV/AIDS competencies into broader public health programs involving task shifting.

Task shifting is now being promoted by a broad-based partnership of political and professional interests and is beginning to be adopted in Ethiopia, Mozambique, Rwanda, Haiti, Uganda,

and Malawi. Country ownership is vital to the sustainability of the approach, but international and bilateral agencies also have an important role to play in supporting and assisting willing governments and communities to make the best use of the task-shifting approach.

Global guidelines are needed to support the implementation of task shifting on a wider scale, and further research is needed to inform the development of such recommendations. The President's Emergency Plan for AIDS Relief is already supporting research and implementation in this area.

Research on the cost-effectiveness and care outcomes of task shifting is needed to allow decision makers to support such deployments. Research is also needed to identify successful training models, and work will be needed to align the various models currently in existence. Greater understanding of the motivation and incentives necessary to maintain commitment and of the logistics and systems to support practitioners regardless of expertise is needed. Career development for practitioners who accept increased tasks and the balance of remuneration also require investigation. Mechanisms must be defined for financing the extra costs that will be associated with an expansion of HIV services through task shifting. Finally, it should be noted that although research is needed in these areas, sufficient data are already available to support a prompt scale-up of HIV-prevention care and treatment through task shifting to save as many lives as quickly as possible.

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From the World Health Organization, Geneva (B.S., F.C., K.M.D.C.); the Office of the US Global AIDS Coordinator, US Department of State, Washington, DC (J.H., M.D.); and the Institute of Tropical Medicine, Antwerp, Belgium (W.V.D.).

1. HIV/AIDS and work: global estimates, impact and response. Geneva: International Labour Office, 2004. (Accessed July 26, 2007, at <http://www.ilo.org/public/english/protection/trav/aidspubl/research/index.htm>.)
2. The Kasongo project: an experience in the organization of a system of primary health care. *Ann Soc Belg Med Trop* 1981;60: Suppl:5-54. (In French.)
3. Sherwood GD, Brown M, Fay V, et al. Defining nurse practitioner scope of practice: expanding primary care services. *Internet J Adv Nurs Pract* 1997;1(2) (Web only). (Accessed July 26, 2007, at <http://www.ispub.com/ostia/index.php?xmlFilePath=journals/ijanp/vol1n2/scope.xml>.)
4. Lankshear A, Sheldon T, Maynard A, et al. Nursing challenges: are changes in the nursing role and skill mix improving patient care? *Health Policy Matters*. Issue 10. July 2005:1-8. (Accessed

- July 26, 2007, at <http://www.york.ac.uk/healthsciences/pubs/Hpm10.pdf>.)
5. Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ* 2002;324:819-23.
 6. Miles K, Seitio O, McGilvray M. Nurse prescribing in low-resource settings: professional considerations. *Int Nurs Rev* 2006; 53:290-6.
 7. Yong CS. Task substitution: the view of the Australian Medical Association. *Med J Aust* 2006;185:27-8.
 8. Duale S. Delegation of responsibility in maternity care in Karawa rural health zone, Zaire. *Int J Gynaecol Obstet* 1992;38: Suppl:S33-S35.
 9. Wilson IB, Landon BE, Hirschhorn LR, et al. Quality of HIV care provided by nurse practitioners, physician assistants, and physicians. *Ann Intern Med* 2005;143:729-36.
 10. Dovlo D. Using mid-level cadres as substitutes for internationally mobile health professionals in Africa: a desk review. *Hum Resour Health* 2004;2:7.
 11. Clarke M. Towards cost-effective tuberculosis control in the Western Cape of South Africa: intervention study involving lay health workers on agricultural farms. Stockholm: Karolinska University Press, 2005. (Accessed November 16, 2007, at <http://diss.kib.ki.se/2005/91-7140-314-0/thesis.pdf>.)
 12. Lehmann U, Friedman I, Sanders D. Review of the utilisation and effectiveness of community-based health workers in Africa. JLI working paper 4-1. Working Group 4, 2004. (Accessed July 26, 2007, at <http://www.globalhealthtrust.org/doc/abstracts/WG4/LehmannFINAL.pdf>.)
 13. Abbatt F. Scaling up health and education workers: community health workers: literature review. London: DFID Health Systems Resource Centre, March 2005.
 14. Bell D, Go R, Miguel C, et al. Diagnosis of malaria in a remote area of the Philippines: comparison of techniques and their acceptance by health workers and the community. *Bull World Health Organ* 2001;79:933-41.
 15. Stop TB. Department. Community contribution to TB care: practice and policy. Review of experience of community contribution to TB care and recommendations to national TB programmes. Geneva: World Health Organization, 2003.
 16. Lewin S, Dick J, Pond P, et al. Lay health workers in primary and community health care. *Cochrane Database Syst Rev* 2005;1: CD004015.
 17. Behforouz HL, Farmer PE, Mukherjee JS. From directly observed therapy to accompagnateurs: enhancing AIDS treatment outcomes in Haiti and in Boston. *Clin Infect Dis* 2004;38:Suppl 5:S429-36.
 18. Hirschhorn LR, Oguda L, Fullem A, Dreesch N, Wilson P. Estimating health workforce needs for antiretroviral therapy in resource-limited settings. *Hum Resour Health* 2006;4:1.
 19. The president's emergency plan for AIDS relief: report on work force capacity and HIV/AIDS. Washington, DC: Office of the U.S. Global AIDS Coordinator, Department of State, July 2006. (Accessed July 26, 2007, at <http://www.state.gov/documents/organization/69651.pdf>.)
 20. Stringer JSA, Zulu I, Levy J, et al. Rapid scale-up of antiretroviral therapy at primary care sites in Zambia: feasibility and early outcomes. *JAMA* 2006;296:782-93.
 21. Pienaar D, Myer L, Cleary S, et al. Models of care for antiretroviral service delivery. Cape Town, South Africa: University of Cape Town, 2006.
 22. Achieving and sustaining universal access to antiretrovirals in rural areas: the primary health care approach to HIV services in Lusikisiki, Eastern Cape. Cape Town, South Africa: Médecins Sans Frontières, October 2006. (Accessed November 13, 2007, at http://www.equinetfrica.org/bibl/docs/MEDaids_200307.pdf.)
 23. Marston BJ, Macharia DK, Nga'nga L, et al. A program to provide antiretroviral therapy to residents of an urban slum in Nairobi, Kenya. *J Int Assoc Physicians AIDS Care (Chic Ill)* 2007; 6:106-12.

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