



Financial resources required to achieve universal access to HIV prevention, treatment, care and support

Estimating the cost of training and retaining field health workers

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Methodological Annex - XI

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Methods

The first step was to identify how many full time equivalent (FTE) health workers would be required to increase access to HIV services by 2015, under the three scaling-up scenarios: universal access (UA), Phased scale up (PhS) and current scale-up (CS). Estimates of the number of additional patients requiring treatment each year were based on revised estimates of prevalence provided by UNAIDS, and it is assumed that because of the shortage of health workers, new health workers would be required to treat them. Even if health workers were attracted from other parts of the health sector to treat AIDS patients, new workers would have to be trained to replace them in their previous activities.

The next step is to determine what type of health workers will provide treatment. There has been considerable discussion in the literature about task shifting from doctors to nurses and from nurses to community health workers, and further to PHLA and other lay providers to address human resource shortages, one of the main barriers to rapid scaling up activities.(1-3) While we can find evidence from countries that have shifted tasks from doctors to nurses, we did not find any data from countries that have further delegated responsibilities to community health workers or other lay providers.

We have, therefore, estimated the FTE staff needs and the related costs using what we called the *delegated approach*, estimated as follows. Data showing the FTEs actually involved in scaling-up HIV services, including ART, voluntary testing and counseling (VCT) and prevention of mother to child transmission (PMTCT) in different countries were used.(1;2;4-6) The data were divided into two groups, those operating with less than 2 FTE doctors per 1000 patients on ART and those with more than 2 FTE doctors per 1000 patients. The average number of FTE doctors and nurses per 1000 patients observed in the former set of studies was used as the FTE needs for doctors and nurses in the delegated approach (see Table 1). Since data on laboratory technicians, counselors and pharmacy technicians were scarce, we used all the data available as the basis for the average FTE requirements, assuming the needs were identical in a doctor-based and a delegated approach. This approach has obvious limitations, however, since for example more laboratory tests may be expected under the delegated approach.

Table 1 Full time equivalents required per 1000 AIDS patients based o the delegated approach.

Staff cadres	FTE*	Main roles	Source
Doctors	1	ART initiation of complicated cases, management of complicated case and supervision of nurses	Average from Hirschhorn et al 2006 (5 African sites)***
Nurses	6	ART initiation of standard cases and follow up of uncomplicated cases, adherence monitoring counseling and support.	Average from Hirschhorn et al 2006 (5 African sites)***
Laboratory technicians	6	Assist/perform laboratory tests, including HIV test, CD4 measurement.	Average from 4 African country plans****
Pharmacy technicians	1.1	ART and other drugs refill	Average from 4 African country plans****
ART Aides** (counsellors)	9	Counseling and support , mainly for VCT and PMTCT services	Average from 4 African country plans****
Data clerks	1	Patient tracking; registry; quarterly report forms	Assumption

* FTE: Full time equivalents

**any cadres with the shortest clinical training such as health assistants, nursing aids. This could ultimately be covered by lay providers, especially PLHA (people living with AIDS).

***Source: Hirschhorn LR et al 2006(6), Table 10, African sites 2 and 4-7.

****Source: Butera et al 2005;(2) Chandler et al 2005;(4) Kombe etal 2005a;(1) and Kombe et al 2005b.(5)

Once the number of new FTE health workers required each year between 2006 and 2015 had been estimated, it was then possible to identify what would be required to train and retain them in the system. This was done as follows.

Train

Health worker shortages exist in most countries now while training new personnel takes some years. It is, therefore, assumed that new staff can be recruited in the short run either from other countries, or encouraged to return to the health sector from other activities. This leaves us with two scenarios for pre-service training. In the first, the additional staff hired while new health workers are being trained stay in the system, so replacements do not have to be trained (called additional). In the second, they are assumed to leave once local workers are trained, so replacements also have to be trained (called total).

Data on the cost of producing graduate doctors and nurses in developing countries are limited, and none exist for pharmacist or laboratory technicians. (7-11) We, therefore, used the average costs of training doctors and nurses from the literature, translated this

into a ratio of costs to GDP per capita, and then extrapolated the results to other countries based on the differentials in GDP per capita. The cost of training laboratory and pharmacy technicians was assumed to be 100% of the cost of training nurses, offered for one year, followed by on-the-job training and supervision, the cost of which is based on 0.2 FTE monthly for 6 months followed by 0.1 monthly thereafter. Capital items are only included in terms of their depreciation value, so up front cash to build new schools is not taken into account, partly due to the short time frame of this analysis and assuming current facilities are able to cope with the additional human resources needs for HIV/AIDS. While this may be a reasonable assumption for most countries, once the total needs to scale up human resources for health is considered these assumptions may not be realistic for some countries.

Attrition rates for medical and nursing students were based on two studies from South Africa.(7;12) Due to the lack of studies reporting attrition rates for laboratory and pharmacy technician students, we based the analysis on the data for nurses, as shown in Table 2.

Table 2 Attrition rates by year and type of education

Type of student	year 1	year 2	year 3	year 4	Year 5	year 6
Doctors	11.9%	32.4%	7.9%	5.4%	3.5%	0%
Nurses (General nursing and midwifery)	20%	19%	11%			
Laboratory or pharmacy technicians	20.0%					

¹ the average of 3rd and 4th years was taken(7;12)

² as in the first year for nurses

Retain

Estimating the cost of retaining health workers is a major challenge since little is known about what strategies work in different countries. However, putting a price tag on this element helps to identify the order of magnitude of the likely resources required, regardless of the strategy being used. Low salaries are widely recognized as one of the most significant factors associated with brain drain among health workers.(13-15) An EQUINET survey of salaries for nurses found that an experienced nurse could earn 3 to 5 times more if he/she worked in the United Kingdom than in South Africa.(15) The Millennium project estimates of the costs of scaling up assumed that salaries of health workers would need to be doubled to retain them in the country.(16) Based on this, we explored two scenarios - salaries would need to be doubled, or increased five fold, to retain health professionals. Using multiples of salaries is merely a convenient method of expressing the amount that might be needed to retain health workers. The resulting figures do not have to take the form of salary increases exclusively but can also be paid out as benefits, allowances, etc. This increase was applied to all staff working with HIV/AIDS, including doctors, nurses and midwives, as well as pharmacy and laboratory

technicians. Salary levels in the different countries for each cadre of worker were taken from the WHO-CHOICE data base.(17)

Results

The global number of FTE needed to scale up HIV services for the three scenarios is presented in Table 3.

Table 3 Additional FTEs¹ needed to scale up HIV/AIDS services² by scenario in 2006-2015

Total FTE needs to scale up HIV/AIDS services	Universal Access	Phased Scale-up	Current Scale-up
Doctors	18,509	15,699	8,233
Nurses	111,051	94,194	49,401
Laboratory technicians	111,051	94,194	49,401
Pharmacists	20,359	17,269	9,057
ART Aids	166,577	135,302	82,255
Total	427,548	356,657	198,346

¹ FTE= full time equivalent. Estimates of FTE needed represent the HIV share of total health workforce needs to scale up essential interventions.

IMPORTANT NOTE: The human resource needs estimates will be revised based on the results of the Task shifting evaluation study coordinated by the joint WHO/UNAIDS/PEPFAR collaboration on "Task shifting" Results should be available by the first half of 2008.

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