

New Thinking in Addressing the Rising Challenges of Human Resources for Health in Sub Saharan Africa

Gilbert C Kombe MD, MPH, Senior HIV/AIDS Technical Advisor, Abt Associates Inc.

John Fieno, PhD, Adjunct Professor, School of Public Policy, George Mason University.

ABSTRACT

The current momentum in mobilizing Human Resources for Health (HRH) issues must move from analysis to action. There is enough evidence indicating that the current crisis in HRH in sub-Saharan Africa (SSA) is severely undermining public health systems and their capacity to expand coverage in maternal and child health, HIV/AIDS and other infectious diseases. This paper proposes an aggressive series of initiatives to address the HRH shortage across the region: the addition of 67,500 physicians and 237,500 nurses by the end of 2012. A short-term plan would re-train and re-hire 30,000 currently unemployed or under-employed medical doctors by the end of 2009; a medium-term plan would graduate 37,500 additional physicians. The two programs for the 67,500 new medical doctors are estimated to cost U\$3.5 billion over seven years. Some countries have reached crisis levels. Clearly, funding for the interventions has to come from both national governments and international community. The proposed contribution of U\$1.75 billion over seven years through bilateral aid represents only six percent of the current annual level of bilateral aid to SSA health systems. Although SSA countries seem to face substantial burden to match the bilateral contribution, U\$1.75 billion over seven years may not be a major challenge for SSA.

Background

The shortage of Human Resources for Health (HRH) in sub-Saharan Africa (SSA) is dire. The Global Atlas of the Health Workforce from the World Health Organization (WHO) reports that the 660 million people of SSA only had 93,763 medical doctors in 2004, or one for every 7,103 people.¹ This is way below the WHO minimum standard of one physician for every 5000 inhabitants. According to the WHO estimates, SSA needs roughly 40,000 additional doctors to deliver health services. Within the region, 34 countries do reach the WHO ratio of doctors per population. Although the severe shortage of medical doctors demands a great deal of attention, the HR deficit in nursing might be as grave. Sub-Saharan Africa had 438,000 nurses in 2004, or one nurse per 1,500 people in the general population. The concentration of nurses haunts the region: nearly half of all the continent's nurses reside in South Africa and Nigeria. The nursing shortage also seems to be easier to solve; nurses are trained more quickly (three years versus five years for physicians) and more cheaply (less expensive to train and pay). Nurses remain an integral part of service delivery in the HIV/AIDS epidemic, especially as potential counselors for voluntary counseling and testing (VCT). Most importantly, additional in-service training might allow for task-shifting: nurses could assume duties or services traditionally performed by doctors, especially in maternal health.

The status of midwives and pharmacists is very similar to doctors and nurses. The region has 81,009 midwives, or one midwife for every 5,561 of the population. With the shortage of doctors, this level of midwife coverage is a welcome sign for maternal and child health. The majority of midwives, however, reside in two countries--Tanzania (13,280 midwives) and Nigeria (47,847). If these two countries are excluded from the analysis, the ratio becomes one midwife for every 14,605 people. The distribution of pharmacists mirrors that of midwives. Sub-Saharan Africa has 26,075 pharmacists, or one pharmacist for every 23,375 people. Nigeria and South Africa, however, have 75 percent of the region's pharmacists; excluding those two countries, the ratio of pharmacist to population increases to one pharmacist for every 64,640.

Many reasons have been cited for the region's shortage of HRH including brain drain, civil war-social unrest, structural and fiscal adjustment, poor working conditions, work related stress or fatigue. Recently, HRH has gained more attention in light of the two international health initiatives: the Millennium Development Goals (MDGs) and the WHO's 3 by 5 Initiative. The MDG Initiative set specific targets in reducing maternal and child health mortality rates, HIV prevalence rate, Malaria, and Tuberculosis. Yet it has become increasingly clear that additional health personnel are needed to expand health coverage in order to meet the MDG targets. The scaling up of highly antiretroviral therapy (HAART), however, showed the consequences of the HRH shortage. Zambia, Ethiopia, Cote d'Ivoire and Malawi are struggling to expand their HAART coverage not because of the lack of funding or the cost of ARV drugs but rather because of the lack of health personnel to provide services (Kombe et al. 2005a, 2005b; Butera et al. 2005; BBC, 2005).

¹ All data within this section comes from the Global Atlas of Health Workforce from the WHO (<http://www.who.int/hrh/en/>) unless otherwise noted.

Perhaps the most discouraging part of the HRH issue is the intractable nature of it. The HRH crisis across the region is not uniform and therefore, it would be a grave mistake to develop a one size-fit-all solution to the problem. The authors of this paper use the doctor-to-population ratio to measure the severity of HRH in a country. The doctor to population ratio is used because doctors possess a specific skill set that cannot be easily substituted. Despite severe shortages in other health professions, the doctor-to-population ratio serves as a proxy for HR capacity in national health systems. The HRH deficit (DPR-WHO) is measured as the number of doctors divided by the number of doctors needed to meet the WHO target of one doctor for every 5,000 people. For example, if a country has 2,500 doctors but needs 5,000 to meet the WHO target, its DPR-WHO mark is 0.50. In Table 1, Swaziland has a ratio of 0.92, which means that Swaziland meets 92 percent of its WHO standard. According to this measurement, the 43 Africa countries are grouped into stable, pressing and urgent categories relative to their HRH shortage, as defined in Box 1.

Box 1: Breakdown of Categorization of HRH Shortage in 43 African Nations

DPR-WHO is measured as the number of doctors divided by the number of doctors needed to meet the WHO target of one doctor for every 5,000 people.

- ❑ Stable Countries = DPR-WHO above 0.90.
- ❑ Pressing Countries = DPR-WHO between 0.41 and 0.89.
- ❑ Urgent Countries = DPR-WHO ratio below 0.40.
 - Medium = HIV+ prevalence between 4.4 and 9.9 percent.
 - High = HIV+ prevalence above ten percent.

The stable category refers to eight countries (Nigeria, Congo, Gabon, Ghana, South Africa, Guinea-Bissau, Namibia, Botswana, Swaziland and Equatorial Guinea) with a doctor ratio above 0.90. The pressing category refers to five countries (Madagascar, Guinea, Mauritania, Kenya, Cape Verde) with a critical HRH shortage scoring between 0.40 and 0.90. Finally, across the region, 27 of the 43 countries are below 40 percent of WHO standard and requires immediate intervention. High HIV-prevalence coupled with the HRH deficit demand additional attention within the urgent category. Countries with a rate of HIV-prevalence between 4.4 and 9.9 percent are deemed as urgent countries with a medium-level HIV/aids epidemic: Togo, Côte d'Ivoire, Cameroon, Burundi, Liberia, Rwanda, Democratic Republic of the Congo, Chad, Sierra Leone and Ethiopia. Countries with a rate of HIV-prevalence above 10.0 percent are as urgent countries with a medium-level HIV/aids epidemic: Lesotho, Zimbabwe, Zambia, Malawi, Central African Republic, and Mozambique.

Table 1: Stable, Pressing and Urgent Status of Human Resources in Health (HRH) across 43 African Countries with Doctor-to-Population Ratio

STABLE		DPR-WHO	
Swaziland	0.92		
Equatorial Guinea	1.01		
Guinea-Bissau	1.02		
Nigeria	1.16		
Botswana	1.22		
Congo	1.23		
Namibia	1.29		
Gabon	1.61		
South Africa	3.49		

PRESSING		DPR-WHO	
Madagascar	0.45		
Guinea	0.48		
Mauritania	0.53		
Kenya	0.58		
Cape Verde	0.68		
Sudan	0.78		

URGENT		DPR-WHO		HIV+ rate	
Somalia	0.17			0.1%	
Senegal	0.31			0.8%	
Gambia	0.21			1.2%	
Niger	0.16			1.2%	
Burkina Faso	0.20			1.8%	
Mali	0.24			1.9%	
Benin	0.23			1.9%	
Eritrea	0.12			2.7%	
Angola	0.31			3.9%	
Uganda	0.26			4.1%	
Tanzania	0.12			4.1%	
Ethiopia	0.15			4.4%	
URGENT: Medium		DPR-WHO		HIV+ rate	
Chad	0.13			4.8%	
Dem Rep Congo	0.29			4.9%	
Rwanda	0.10			5.1%	
Liberia	0.09			5.9%	
Burundi	0.23			6.0%	
Cameroon	0.32			6.9%	
Côte d'Ivoire	0.39			7.0%	
Sierra Leone	0.30			7.0%	
Togo	0.27			8.8%	
URGENT: High		DPR-WHO		HIV+ rate	
Mozambique	0.12			12.2%	
Cen African Rep	0.15			13.5%	
Malawi	0.06			14.2%	
Zambia	0.32			15.6%	
Zimbabwe	0.28			24.6%	
Lesotho	0.23			28.9%	

DPR-WHO refers to the ratio of number of employed medical doctors over the number of medical doctors needed to meet the WHO standard for each country in 2004.

HIV+ rate refers to the rate of adult HIV-prevalence.

Sources: Source: Global Atlas of Health Workforce, WHO; World Bank.

New thinking in addressing HRH Issues in the Continent

It is clear that current national and international interventions and policies may not address the HRH problem in any meaningful way in the short-and long-term. HRH assessments from selected countries indicate that thousands of doctors and nurses in the region are under-employed or unemployed because their home countries cannot afford their services due to budget constraints (Butera et al. 2005). Recently, a few bilateral agencies are exploring innovative arrangements to pay salaries of additional health care workers in highly HIV/AIDS impacted countries. The United States Agency for International Development (USAID) is paying for 300 nurses in Kenya (Kombe et al.

2006). These same arrangements could be used to re-train and employ these non-practicing physicians in countries with the greatest need. Finally, SSA medical schools used to produce thousands of doctors than it does today, primarily due to lack of funding, too few teaching facility and civil unrest. Additional funding to medical schools and planning to recruit and retain national teaching faculty can increase the number of new medical students in the short-to-medium term.

How can SSA meet the HRH deficit?

This paper uses doctors as an illustrative example of how SSA can meet the HRH deficit. In order to meet the WHO doctor to population ratio of 1: 5,000 people by 2012, the 27 countries in the urgent category need 69,633 additional medical doctors. The countries in the pressing category require an additional 8,000 medical doctors. This paper proposes a two prone approach. The approach will consist of both short-term and medium-to long-term plans to have 67,500 additional doctors (or 97 percent of the need) by the end of 2012, as shown in Table 2. The goal of the short-term approach is hire 30,000 additional doctors by the end of 2009. This strategy involves a gradual retraining of under-employed or unemployed doctors and their placement in countries of greatest need as soon as possible. In the first year, ministries of health across the region would recruit and place about 5,000 doctors in 2006. Years two and three would hire about 10,000 doctors annually. Year 4 would see a small increase, in large part because most doctors for this plan would already be in the system.

Table 2: Africa Doctor Initiative: 67,500 Doctors by the End of 2012

PLAN	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	TOTAL
Short-Term	5,000	10,000	10,000	5,000				30,000
Medium-Term					12,500	12,500	12,500	37,500
Cumulative TOTAL	5,000	15,000	25,000	30,000	42,500	55,000	67,500	67,500

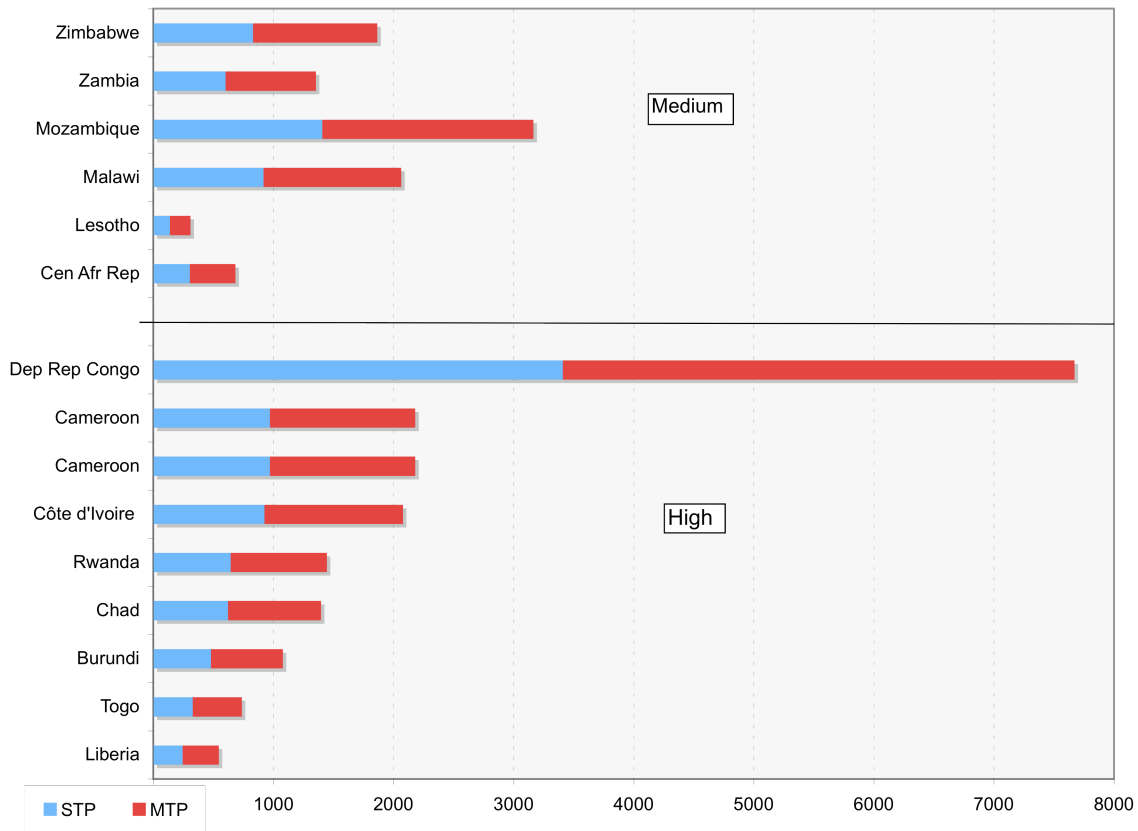
The medium-to long-term plan (MTP) requires three integral parts in order to reach the mark of 30,000 additional doctors by the end of 2009. In order for this Initiative to succeed, a number of prerequisites must be fulfilled. First, substantial planning must go into the identification and recruitment of under-employed or unemployed doctors, especially in countries with large potential surpluses (Nigeria, Cote d'Ivoire, Kenya). Second, careful planning also is needed to develop a short but comprehensive re-training program for these doctors; perhaps a short refresher course for newly graduated doctors would suffice, but a longer re-training program (six-to-nine months) might be necessary for others who have not practiced in years. Furthermore, recruitment and retention of additional lecturers is a crucial element of the re-training program. Finally, coordination among African government is fundamental so that nations with severe deficits can be matched with countries with doctor surpluses. SSA has experience with expatriate doctors traveling and practicing in the region. For

example, Nigerian doctors have moved to Zambia through a bilateral agreement to practice medicine. The African Union might serve as conduit for matchmaking between countries.

While short-term plan brings doctors back into service immediately, the long-term plan deals with sustaining the short-term solution by graduating indigenous doctors from African medical schools. While it is estimated that sub-Saharan Africa graduates 5,100 medical doctors annually (Eckhert 2002), the medium-Long-term Plan calls for 12,500 additional medical students enrolled every year starting in 2006. This plan will only work if the teaching capacity in many medical schools in the region is strengthened substantially. A number of countries have seen a dramatic reduction in the number of new doctor graduates, which points to unused capacity in pre-service training. For example, Cote d'Ivoire used to graduate 1,100 medical doctors annually, but civil unrest closed its northern medical school and reduced that figure to under 400 (Kombe et al. 2005b). If African countries can pay and subsequently retain their medical school faculty, they have the facilities and eager students to reach the annual regional goal of over 17,000 medical graduates. Table 2 shows the annual influx of 12,500 doctors from 2010 to 2012.

By the end of 2012, MTP will produce 37,500 doctors, and the initiative would add 67,500 physicians in total. How will these doctors be distributed across the continent? Table A in the appendix lists the annual cumulative targets for each of the SSA countries in the urgent category. Among the 27 countries, 55 percent of the new doctors will serve in five countries: Mozambique (3,636), Uganda (3,934), Tanzania (7,097), Democratic Republic of the Congo (8,812), and Ethiopia (13,218). Figure 1 shows the breakdown by short- and medium term plans for the countries with medium and high HIV/AIDS epidemics. SSA countries with a medium-level HIV/AIDS epidemic in the urgent category (adult HIV-prevalence rate between 4.4 and 9.9 percent) need 19,308 medical doctors by the end of 2012 to meet the WHO standard. SSA countries in the urgent category with a high level HIV/AIDS epidemic (adult HIV-prevalence rate above ten percent) require 9,437 medical doctors by the end of 2012 to meet its HRH initiative target.

Figure 1: Number of Doctors Needed to Meet WHO Standard for SSA Countries in Urgent Category with Medium and High Level HIV/AIDS Epidemics, 2006-2012, by Short-term (STP) and Medium Term (MTP) Plans



Absent so far from this discussion is the introduction of Western-born physicians or nurses to work in areas of severe need. Some institutions and non-governmental organizations (NGOs) have offered or even begun programs that bring Western doctors into SSA to practice medicine for a short time. These proposals fail to account for the huge wage differentials between doctors from the OECD and SSA. American physicians earn more than African doctors by a factor between four and 150 (Vujcic et al. 2004), and therefore, short-term exchange programs are not sustainable in ameliorating the HRH deficit in SSA.

Recently, Bristol Meyers Squibb began Secure the Future, a program of corporate philanthropy that will spend U\$150 million to create a pediatric medical corps of 250 American doctors and to train in-country health professionals to serve 80,00 children in SSA.³ Under that target, the cost per child patient for Secure the Future would be approximately U\$2,000; the current cost of treating one pediatric AIDS patient across SSA is a fraction of that. The difference in cost is due primarily to the higher salaries of

³ <http://www.securethefuture.com/>

the American volunteers. Noble intentions aside, doctor exchange programs are not a judicious way to use aid, public as well as private, from OECD countries. If a young physician wants to volunteer for an NGO (Doctors without Borders, Catholic Relief Services, World Vision) or an established academic professor wants to use a year of sabbatical or leave in an SSA (with his home institution covering his or her salary), those opportunities already exist.

How much will this cost?

This section discusses the cost and financing of the proposed initiative. Table 3 breaks down the cost for doctors. In the short-term plan, there are two primary expenses: the cost of re-training current but non-practicing doctors and their salaries. (A more detailed breakdown of the cost of the short-term plan is in Table B in the appendix.) The re-training regimen across the region might range from three to twelve months in duration, and therefore, the cost might vary widely as well. This cost estimate for re-training one physician is a one-time occurrence at U\$5,000, or two-thirds of the cost of one year of medical school, U\$7,500, which is explained below. In 2006, 5,000 doctors would enter re-training at a cost of U\$25 million. The scaling up of short term plan would have 10,000 additional doctors enter the re-training program at a cost of U\$50 million per year for 2007 and 2008. The consolidation of short-term plan would decrease the number of doctors to 5,000 at a cost of U\$25 million. The cost of retraining 30,000 doctors would be U\$150 million.

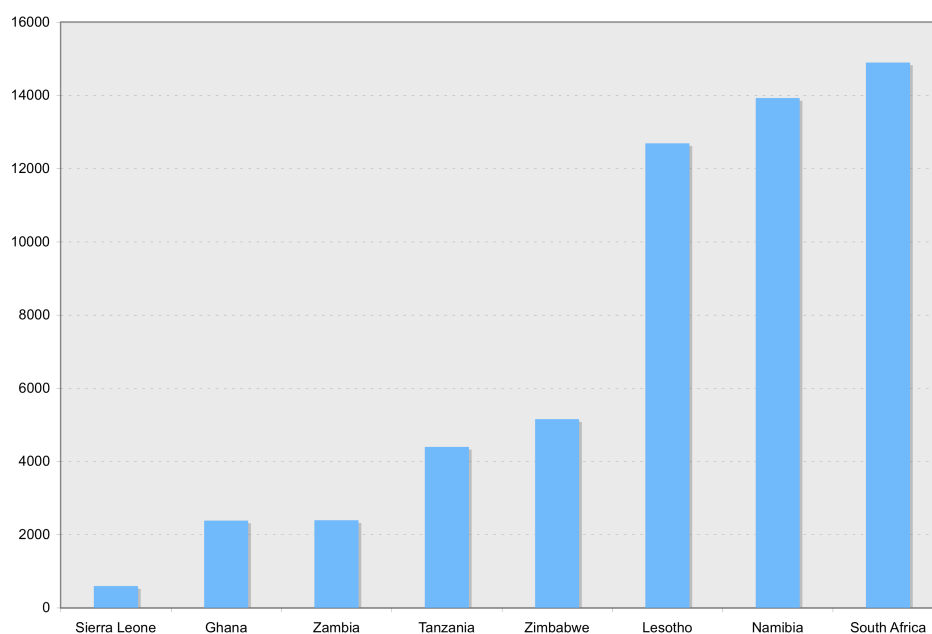
Table 3: Cost Estimates of the Additional Training and Hiring of 67,500 Medical Doctors , 2006-2012 (in U\$ millions)

	2006	2007	2008	2009	2010	2011	2012	TOTAL
Short term plan (STP)								
Re-training Cost	25	50	50	25	0	0	0	150
Salary	25	75	125	150	150	150	150	825
STP Sub-total	50	125	175	175	150	150	150	975
Medium term plan (MTP)								
Training Cost	94	188	281	375	469	469	469	2344
Salary	0	0	0	0	0	63	125	188
MTP Sub-total	94	188	281	375	469	532	594	2532
STP + MTP (DOCTORS)	144	313	456	550	619	682	744	3507

The more expensive component of short-term plan is the salaries for the newly re-trained doctors. In Figure 2, the annual salary of junior physicians ranges from U\$600 in Sierra Leone to approximately U\$15,000 in the Republic of South Africa (Vujicic et al. 2004). It is important to note that Lesotho, Namibia, South Africa have annual wages for new doctors above U\$10,000, but those southern African countries are also in the

stable category in terms of the HRH crisis. The cost estimate for the annual salary for a doctor is U\$5,000, which is a midpoint between the low and high ends of the wage distribution. In 1999, Zimbabwe paid an entry-level salary for doctors of U\$5,160 (Huddart and Picazo, 2003); in 2005, Tanzania raised the salaries of their doctors to a minimum of U\$4,400 (IRIN, 2005). The situation in Zimbabwe and Tanzania likely reflects wage levels across the other 25 countries within the urgent category, so U\$5,000 seems reasonable as a cost estimate. In 2006, only 5,000 doctors are paid U\$25 million, but as training is accelerated, the wage bill increases. In 2007, 15,000 doctors receive U\$75 million; in 2008, 25,000 doctors earn U\$125 million. In 2009, the wage bill of 30,000 doctors would be U\$150 million, which would be the annual cost from 2010 to 2012. The cost of doctor salaries would be U\$825 million, and the total cost of the short-term plan would be U\$975 million.

Figure 2: Salaries of Junior Medical Doctors in Selected African Countries



Source: Padarath et al. (2003).

The medium-term plan represents a much larger investment because of the pre-service training of medical doctors (medical school), as shown in Table 3. (A more detailed breakdown of the cost of the medium plan is in the appendix.) The cost estimate of one year of medical school is U\$7,500. Uganda has the estimated cost of training one medical student at per year U\$4,700 (Matsiko and Kiwanuka, 2003); Tanzania at \$6,000 (Business Times, 2003); Kenya at U\$8,000 (International Organization of Migration, 2003); Zimbabwe at U\$8,200 (Huddart and Picazo, 2003); and South Africa at U\$12,000 (Padarath et al. 2003). While much has been made of brain drain, a crucial element of the HRH initiative is the hiring and retention of medical teaching faculty. Anecdotal evidence suggests that that tuition costs could be lower in other SSA countries, but this cost estimate incorporates a premium that might have to be paid to keep medical professors in country. The appropriate salary level for teaching faculty

that keeps them on the staff without the public sector wage skyrocketing is a delicate balancing act.

The first cohort of 12,500 additional students would enter medical school in 2006 at a cost of U\$94 million, and an additional U\$94 million would be needed for every consecutive class from 2007 to 2010. The annual cost from 2010 to 2012 would be U\$469 million--the cost of five medical school classes. The total cost of medical school would be U\$2.344 billion, the lion's share of the total initiative. Only two graduating classes would be practicing physicians in the period, and their wage bill would be U\$188 million. The total cost of the medium-term plan would be U\$2.531 billion. The total cost of the HR doctor initiative—67,500 additional doctors practicing medicine in sub-Saharan Africa by the end of 2012—is U\$3.506 billion. It is important to note that the cost of the HRH programs for doctors and nurses is proportional given the absence of start-up costs. If the programs were scaled back to 70 percent of the original HRH target in 2012, the total cost would be 70 percent of U\$3.5 billion, or U\$2.4 billion.

Indeed, U\$3.5 billion over seven years is a significant investment in HRH in SSA, and that number was estimated through a series of cost projections for the short- and medium-term plans. The costs of training and salaries for junior physicians in the projections reflected the current cost structure in SSA. It could be argued that the total cost projection is too high because many SSA countries pay lower doctor salaries than U\$5,000, the figure used in the model. Nevertheless, there are reasons to believe that the cost model is under-estimating the total cost. The HRH initiative might have an inflationary effect on wages for new physicians, teaching faculty and indirectly, other health personnel. Administrative costs of the initiative could be substantial as well. The plans' effects on wage levels or administrative costs were not addressed in the costing model.

Innovative Ways of Paying for the Initiative

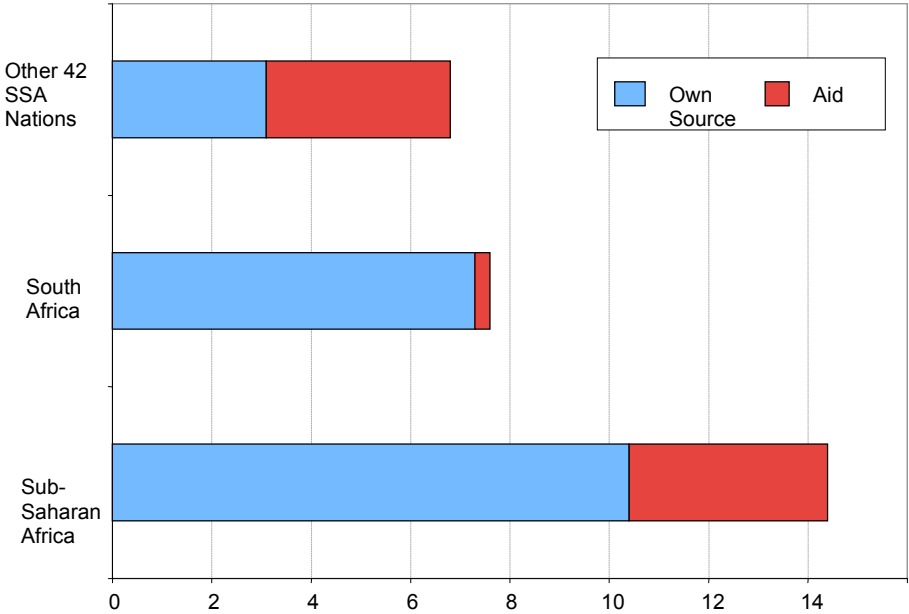
This paper proposes a 50-50 split on the cost between bi-lateral aid and African government funding (that also might be in the form of multi-lateral aid). Proponents of foreign aid to health systems have always argued that donor funds may crowd out public expenditure on social services such as health and education in low resource countries. Specifically, they fear that foreign aid might create a moral hazard for countries that discourages them from investing in public health, and worse, such crowding out might encourage corruption as funding originally tied to health go into a common pool.

Three reasons suggest that a 50-50 split of the cost of the initiative will not create a moral hazard. First, this initiative can be viewed as a matching grant program; such a large project requires extensive planning and coordination in addition to substantial public investment by African nations. Bi-lateral aid can act as the matchmaker not only to fund the initiative but also to spur the collaboration so vital for its success. Second, these initiatives are essentially targeted towards salaries in the health sector. Such

categorical grants pay the salaries of health professionals or teachers in developing countries and do not have the same degree of corruption as other aid programs (e.g. infrastructure or any capital project). Finally, there is little evidence so far of foreign aid crowding out own source funding in public health. While Zambia and Mozambique reduced their own public health expenditure as they received more aid towards the AIDS epidemic, Lesotho, Ethiopia, Kenya, Swaziland and Tanzania increased their public spending in health upon their receipt of greater amounts of health aid (Lewis, 2005).

The cost of the HRH initiative must be compared to current levels of region’s health expenditure and aid in order to determine feasibility. Figure 3 shows the breakdown of African public health spending and Western aid in 2004. In sum, the 43 sub-Saharan African countries spent U\$14.3 billion on public health. South Africa, however, accounts for U\$7.7 billion of that total (OECD). Western countries gave U\$3.373 billion in bi-lateral aid and U\$0.664 in multi-lateral aid to health systems in sub-Saharan Africa. The grand total of Western aid towards health in African was U\$4.034 billion, of which a majority went to HIV/AIDS prevention and treatment. South Africa only received US\$0.3 billion in all forms of foreign aid. The other 42 countries spent U\$6.6 billion in public health, of which roughly U\$3.7 billion came from bi-lateral and multi-lateral aid. The total cost of the HRH initiative equals slightly less than one year of Western aid towards African health systems.

Figure 3: Breakdown of African Public Health Spending by Western Aid and Own Source Government Expenditure, 2004 (U\$ billions)



Source: OECD.

The total GDP for the 27 African countries in the urgent category was U\$161 billion in 2004 (World Bank). Their total public health expenditure was U\$2.9 billion (including foreign aid); public health accounted for 1.8 percent of GDP. If that set of 27 African countries have an annual growth rate of three percent (independent of population), they will have an economic output of U\$1.309 trillion from 2006 to 2012. If those 27 African countries spend 1.8 percent of GDP on health, that would be of U\$23.6 billion (including aid) over the seven year period. The initiative costs U\$3.5 billion, which is roughly 15 percent of aggregate public health spending in those 27 countries over the seven-year period. Under the 50-50 split, these 27 African countries would need to spend 7.5 percent of its public health budgets annually on the HRH initiative. Although U\$1.75 billion (one-half of the total cost of the HRH initiative) seems to be an arduous burden, these 27 African countries can afford this investment in their health system, especially if multi-lateral aid or NGO funding can help to shoulder part of the bill. Moreover, the proposed 50-50 split in the funding of the U\$3.5 billion HRH plans creates fiscal incentives for SSA countries to control costs, especially in the administration of the plans.

Conclusions and Way Forward

Several NGOs and advocacy groups have been pushing for HRH to be placed on the policy agenda in terms of aid for Africa. The current momentum in mobilizing HRH issues must move from analysis to action. There is enough evidence indicating the severity of the situation in sub Saharan Africa. Some countries have reached crisis levels. Clearly, funding for the interventions has to come from both national governments and international community. We need to communicate to policy makers and decision makers that investments in medicines and commodities will go to waste if the situation of HRH is not addressed.

In light of the need for immediate action, policy coordination might be as important as funding. It is clear that the success of the initiative falls on coordination not only between Western donors and SSA countries but also among SSA countries. The expansion of exchange programs that send physicians from countries with a large concentration of unemployed doctors (Nigeria) to countries with severe doctor shortages (Malawi) is critical to the success of the HRH initiative. The short-term plan is based primarily on the matching of recipient and exporting countries of medical personnel. The historical and institutional inertia towards such coordination in HRH could undermine the initiative, but the increased policy coordination through the African Union and other multi-lateral institutions is a welcome sign.

APPENDIX

**Table A: Medical Doctor Cumulative Targets by Country and Year
for 27 Urgent Countries, 2006-12**

	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Cape Verde	2	7	12	14	20	26	32
Gambia	12	35	59	70	99	129	158
Mauritania	21	63	105	126	178	231	283
Lesotho	23	69	114	137	195	252	309
Liberia	40	121	202	242	343	444	545
Cen Afr Rep	51	152	253	304	430	557	683
Sierra Leone	52	156	259	311	441	570	700
Eritrea	52	156	260	312	442	572	702
Togo	54	163	272	327	463	599	735
Guinea	62	186	310	372	526	681	836
Burundi	80	239	399	479	678	878	1077
Benin	80	241	402	482	683	884	1085
Zambia	100	301	501	601	852	1102	1353
Senegal	102	306	509	611	866	1120	1375
Chad	103	310	517	620	878	1137	1395
Sudan	106	317	529	634	898	1163	1427
Rwanda	107	321	535	642	910	1177	1445
Somalia	110	331	552	662	938	1214	1490
Mali	124	371	619	743	1052	1362	1671
Madagascar	131	394	656	788	1116	1444	1772
Zimbabwe	138	414	690	828	1174	1519	1864
Burkina Faso	141	424	707	849	1203	1556	1910
Angola	142	426	711	853	1208	1564	1919
Niger	149	448	746	895	1268	1641	2014
Malawi	153	458	764	917	1299	1681	2063
Côte d'Ivoire	154	462	770	924	1308	1693	2078
Cameroon	162	485	808	969	1373	1777	2181
Kenya	191	574	957	1148	1627	2105	2584
Mozambique	234	703	1172	1407	1993	2579	3165
Uganda	254	761	1269	1522	2156	2791	3425
Tanzania	458	1373	2288	2746	3890	5034	6178
Dep Rep Congo	568	1705	2841	3409	4830	6250	7671
Ethiopia	847	2540	4233	5080	7196	9313	11429
TOTAL	5004	15012	25020	30024	42534	55044	67554

**Table B: Breakdown of Cost: Short-term and Medium-Term Plans
for Medical Doctors, 2006-2012**

MEDICAL DOCTORS								
Short term plan/STP	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	Total
No. of Doctors	5000	10000	10000	5000	0	0	0	
Re-training Cost (U\$)	5000	5000	5000	5000	0	0	0	
Sub-total (U\$ millions)	25	50	50	25				150
No. of Doctors	5000	15000	25000	30000	30000	30000	30000	
Salary	5000	5000	5000	5000	5000	5000	5000	
Sub-total (U\$ millions)	25	75	125	150	150	150	150	825
STP TOTAL (U\$ millions)								975
Medium term plan/MTP	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	
No. of Medical Students	12500	25000	37500	50000	62500	62500	62500	
Training Cost (U\$)	7500	7500	7500	7500	7500	7500	7500	
Sub-total (U\$ millions)	94	188	281	375	469	469	469	2344
No. of Doctors	0	0	0	0	0	12500	25000	
Salary	0	0	0	0	0	5000	5000	
Sub-total (U\$ millions)	0	0	0	0	0	63	125	188
MTP TOTAL (U\$ millions)								2531
TOTAL (U\$ billions)								3.506

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