Investing in Tanzanian Human Resources for Health

an HRH report for the

TOUCH Foundation, Inc.

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Background

The following report was written by McKinsey & Company and is based upon work performed as part of a pro bono strategy project undertaken for the Touch Foundation, Inc. It follows previous work conducted by consultants with McKinsey & Company’s Global Public Health practice, and specifically their previous report, Acting Now to Overcome Tanzania’s Greatest Health Challenge: Addressing the Gap in Human Resources for Health, originally published in May 2003. ‘Human Resources for Health,’ or HRH, is the term used by the public health community to encompass all categories, or cadres, of health care workers, from specialist physicians through to community workers.

The project team undertook extensive field work in Tanzania with particular emphasis on the Bugando Medical Center (BMC, an 850 bed regional hospital), the Bugando University College of Health Sciences (BUCHS), and the Institute for Allied Health Sciences (IAHS), all located in Mwanza, the second largest city in Tanzania.

The hospital at Bugando, BMC, serves as the referral center for both the surrounding area, called the ‘lake district’, which includes the regions of Kagera, Mwanza and Mara, and the rural region to the south, Shinyanga. BUCHS currently incorporates two schools – a start-up medical college (which has been funded largely by the Touch Foundation) as well as three of the six schools contained within IAHS – Pharmacy, Lab Technicians, and Radiology. The schools of Nursing, Assistant Medical Officer and Nurse Anaesthesia are still currently contained within BMC.

Field work was also performed in Dar es Salaam and, in particular, by working with the Ministry of Health and Ministry of Science, Technology and Higher Education, to understand their perspectives and to gather data. Interviews were also performed with a wide variety of in-country representatives of various not-for-profit organizations including, among others, the World Bank, the World Health Organization, USAID, and the Clinton Foundation.

In addition, research and phone interviews were conducted with members of the global health community including, in particular, authors of various published papers and reports on related HRH topics. Finally, we consulted with Weill-Cornell Medical College of New York on issues relating to the operation of medical colleges.

There are a number of underlying issues regarding the quality of data available on this subject, particularly in the developing world. The team made exhaustive efforts to find the best available data, but inevitably some of the information needed was incomplete or conflicting. While we believe that our calculations are directionally accurate, they may not always be absolutely precise. We have erred on the side of our estimates being conservative relative to the points being made.

The authors gratefully acknowledge the generous assistance provided by Bishop Aloysius Balina, chairman of both BMC and BUCHS, Dr. Charles Majinge, director of BMC, Professor Joseph Shija, principal of BUCHS, and Dr. Frederick Kigadye, secretary for health with the Tanzanian Episcopal Conference and
formally of the Ministry of Health, for their aid in arranging interviews and in providing us with data. We are also extremely grateful to the Tanzanian Ambassador to the U.N., Dr. Augustine Mahiga, for his on-going and consistent support of our efforts.

All of the authors of this report are consultants with McKinsey & Company. The lead author who directed the work, Lowell Bryan, served in his dual capacity as a McKinsey director and as President of the TOUCH Foundation. Salim Ramji also assisted in directing the team's efforts, while Ari Silverman managed the project team on a day-to-day basis. The team also drew upon some thirty volunteer associates and analysts to support their research. Considerable help was also provided by members of McKinsey’s global public health practice, specifically Judith Hazelwood, Srividya Prakash, and Michael Conway, and by TOUCH staff Rebecca Brodsky and Angus O'Shea.

**About McKinsey & Company**

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**About TOUCH Foundation, Inc.**

The TOUCH Foundation is a new not-for-profit corporation which began operations in January, 2005. TOUCH’s mission is threefold:

- to provide funding and management resources for local programs that develop human resources for health (HRH) in impoverished countries
- to build awareness around problems in health care delivery in poor countries, and
- to collect, store and provide access to leading information about global health, and to share the knowledge gained from TOUCH-funded programs.

The foundation is located in space donated by McKinsey & Company in New York. Its major donors are the Citigroup Foundation, McKinsey & Company, Sandy Weill (Chairman Emeritus, Citigroup), Stroock & Stroock & Lavan, LLP, TOUCH’s board of directors, and a number of private individuals.

The opinions expressed in the report are those of the authors and may not necessarily represent the opinions of McKinsey & Company, or the directors or employees of, or donors to, the TOUCH Foundation.
Executive Summary

Over the last several years, the world has become aware of the magnitude of the health care crisis in the poorest countries of the world. In Africa, in particular, people are experiencing premature death and suffering from preventable or treatable diseases on an almost unimaginable scale. Life expectancy is actually dropping in sub-Saharan Africa, and death rates are on a scale not seen since the plagues in Europe in the middle ages.

HIV/AIDS is a major culprit, and is the disease most familiar to the general public in the developed world. In Tanzania, 25 percent of the estimated responsibility for premature death and disability is attributable to HIV/AIDS. However, infant death, maternal death, malaria, tuberculosis, cholera, inadequate care of physical ailments and a raft of other diseases and conditions are, in combination, responsible for over 75 percent of premature death and disability in Tanzania, according to the Original Global Burden of Disease estimates published by the World Health Organization (WHO).

As the world in general, and the global public health community in particular, has begun marshalling resources to address this crisis, it has hit a brick wall. While the causes of premature death or suffering are largely preventable, and often certainly treatable, there is an absolute global shortage of health care workers – particularly in Africa – available to diagnose diseases, provide drugs (even if those drugs are readily available), and to treat patients. HIV/AIDS, in particular, requires enormous numbers of health care workers to administer the tests necessary in order to diagnose the disease, counsel the patients and convince them to be treated, and administer the necessary drug regimes.

But the pool of available health care workers is severely inadequate relative to the need for them, and in many cases the skills required far outweigh those available from existing supply. Small-scale pilots can produce good short-term results – they can use donor money to borrow a sufficient supply of health care workers from their current jobs, then spend them on targeted, limited projects. However, this approach simply proves the fallacy of borrowing from Peter to pay Paul: in HRH terms, these programs only reveal the extent of the need and not the identity of the solution.

In short, these projects cannot be scaled-up to become major implementation programs simply because the health care workers needed are not there in the first place. In Tanzania, some have estimated that an additional 10,000 skilled health care workers are needed just to diagnose and treat HIV/AIDS cases before any other issues can be addressed. According to the Tanzanian Ministry of Health’s 2001-02 HRH census, this number compares with a base of only 25,000 skilled HRH in the country.

HRH in increasing focus

The HRH issue appears to be moving to center stage in the global public health arena, thanks to the efforts of people such as Tim Evans of WHO and Lincoln Chen of the Harvard School of Global Public Health, among others. These issues were extensively covered in the Joint Learning Initiative (JLI) report, *Human Resources for Health: Overcoming the Crisis,*

So what are the answers to the HRH crisis? The major levers identified in the previous McKinsey report were to:

- improve the productivity of the existing workforce
- provide better pay and working conditions to health care workers locally
- reduce the ‘brain drain’ of HRH and to treat diseases within the workforce in order to reduce attrition
- attract health care workers who have left the system back into health care, and
- increase the training of new workers.

All of these major levers are important. The following report, using Tanzania as a case study, demonstrates the foundational importance of the need to vastly increase production of skilled health care workers

(Exhibit 1). Even governments could dramatically improve productivity, provide good jobs to retain HRH, stop the brain drain and attract HRH workers back to health care delivery, there would remain an absolute shortage of health care workers in poor nations.

The response to the health care crisis must, therefore, include a dramatic, sustained increase in the number of local citizens who can be attracted to the health care delivery field and trained appropriately, and this is the focus of this report.

In parallel, though, we also believe that efforts need to be made to improve HRH productivity and retention. Tanzania, like many other developing countries, faces several challenges in absorbing HRH training output effectively into the public and private sectors. Issues include deployment in areas of greatest need, providing the workplace conditions, tools and pay to make the workforce productive, and retention of this scarce talent – and doing all of this in a financially sustainable manner. It will be critical for Tanzania and other HRH

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Exhibit 1

An increase in HRH...  

...saves lives...  

7,000 new clinically skilled HRH by 2015

Conservative estimate of average 5 lives saved per year**

30 year careers

1.0 million lives saved of mothers and children only - an average * $100 per life**

...and improves overall health

...leads to more attractive jobs...

...increased income flow...

...and positive economic development.

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* Conservative estimate since this includes only lives saved from maternal, infant, and under 5 conditions based on WHO/ILI regression analysis

** $10,000 cost per HRH trained (conservative using fully loaded operating costs)
stakeholders to address these issues in tandem with the expansion of HRH to ensure the country enjoys the full benefits of such training.

In any case, we feel that efforts in these areas will not be able to make any real progress in this crisis over the longer term without a greatly expanded supply of HRH.

**Higher skilled HRH are also necessary**

This report stresses not just the need to train lower skilled health care workers, but also the even greater need to train more highly skilled health care workers. Some may consider this somewhat counter-intuitive: conventional wisdom has sometimes held that more lower skilled workers – such as nurses and clinical officers – are necessary, especially given the lower cost of training, the relative speed of their training, and the need to disperse health care workers in rural or remote areas which often lack a sufficient critical mass of cases to justify treatment by medical doctors.

It is certainly true that greatly increased supplies of lower skilled cadres of workers are needed. However, it is particularly important to increase the supply of the higher skilled doctors and assistant medical officers (who receive similar clinical training to doctors, but not as much education in biomedical sciences) since these cadres are needed to train the lower skilled cadres. Significant training by higher skilled HRH is required to enable lower skilled HRH to be effective in the diagnosis and treatment of diseases such as HIV/AIDS, malaria and tuberculosis, as well as to perform a wide array of important health care diagnostic functions.

Even more importantly, there are many conditions such as infant malaria (requiring whole body blood transfusions), premature birth, complicated births, physical trauma, cardio-vascular conditions, etc., that require higher skills than those possessed by most clinical officers and nurses. Unfortunately, in some countries, a large fraction of health care workers have almost no formal training at all. In Tanzania, through interviews with the Ministry of Health, we discovered that these ‘unskilled attendants’ appear likely to be phased out over time.

Essentially we believe that a functioning health care system requires a balanced mix of higher-skilled and lower-skilled workers and that unskilled attendants are an ineffective substitute. Hence any solution must aim to produce an appropriate balance of skills in as short a time as possible, particularly considering the differing lead times required.

**Mobilizing an army**

During our research we discovered that the first thought of many who hear of the extreme HRH shortage is that the developed world should mobilize a large population of health care workers and send them to Africa. Unfortunately the reality is the opposite case: the developed world is, in fact, importing health care workers from poorer nations. Reasons for this ‘brain drain’ are simple: it costs far less to educate and pay health care workers in poor nations than in rich ones, and the reward for being a health worker in a rich nation is much greater.

Any strategies designed around using existing rich-world learning institutions can therefore be quickly dismissed on pure economic grounds. The cost of educating HRH and exporting them from rich nations to poor nations is prohibitive. Educating a doctor in the U.S., for example, costs ~$500,000. We have found that educating the same in a country in sub-Saharan Africa will cost
around $50,000. As a consequence, a $10 million investment in medical doctor education in the U.S. produces some twenty doctors, whereas the same investment in the developing world will produce over two hundred.

More to the point, we estimate that even if you were somehow able to mobilize the some 35,000 HRH volunteers needed from the rich world into Tanzania alone, just to meet the minimum standards determined by the Ministry of Health’s 1999 guidelines for staffing levels for health care institutions, and pay them minimum wages plus housing and transport, it would cost nearly $3 billion a year. This sum represents about eleven percent of Tanzania’s total GDP. The sheer numbers of skilled workers required, and the logistical difficulties involved, suggest that this task would be roughly akin to mobilizing an army.

One of the few bright spots in the challenge to increase the supply of HRH is that poor nations can be an ideal place to train health care workers. Nations such as the Philippines and India are demonstrating the cost-effectiveness of their approach, but in Africa, there is another unfortunate advantage in HRH training: an ample supply of cases. Given that abundance, health care workers can learn more, more quickly, in a poor nation than in a rich one, provided the appropriately-skilled trainers exist. A German specialist working at Bugando pointed out that in Germany, he spends sixty percent of his time on paperwork; in Tanzania, he spends ninety percent of his time with patients.

Benefits are clear

While the value of training more HRH is beyond dispute, it is helpful to attach some numbers. Based upon WHO data published in the JLI report, on average, every health care worker trained, even those in lower-skilled categories, will result in approximately 150 unique lives being saved over the worker’s length of service, only counting the impact on maternal and child (under five) deaths. We believe this estimate is too conservative, but better numbers comparing mortality rates to HRH supply are not available.

The full impact of enabling better diagnosis and treatment of other causes of premature death and disability, such as HIV/AIDS, malaria, tuberculosis, etc., that can be gained by adding each additional health worker to the workforce is undoubtedly far, far greater. Greater still is the full impact of training higher skilled health workers who, when remaining in clinical service, have the ability to train others and to provide better clinical service. We believe a crude guess of 350 lives saved per HRH produced (i.e., about one life saved per month over a thirty-year career) would be more realistic.

Implementation constraints exist

The challenge in training a sufficient supply of health care workers is that it is a pipeline problem – and this pipeline will take years to fill before results can be seen. In Tanzania it takes five years to train a doctor, two years to train an assistant medical officer (and that after they have already received three years of training to become a clinical officer), and two years to train a nurse.

Moreover, if a new training facility is to be built and staffed with faculty, it can take even longer to become operational. For example, from the time of the decision to start a medical college (by the founders of BUCHS in Tanzania) to the first student enrollment took ten years. The good news, however, is that while new schools have a long gestation period, the capacities of existing schools can
be quickly improved. Increases can be implemented within one or two years, if bottleneck issues – dormitories, classrooms, faculty, laboratories, etc. – are addressed. Finally, we believe the timeline required to start new schools can be greatly accelerated with adequate funding and outside assistance.

Bottlenecks in student training, rather than the actual availability of students, are the principal constraints to increasing the supply of HRH. For example, in Tanzania there are over 1,000 students annually who apply to medical school – each with sufficiently high exam results to be admitted – but there are only 200 spaces available. At IAHS (partly contained within BUCHS), according to BUCHS staff, they receive approximately 500 applications each year just for the AMO training program – for fifty available spaces.

Indeed, we estimate that, with the available assistance of donors such as the TOUCH Foundation, Tanzania can double its annual HRH training capacity in both higher and lower skilled categories by 2015 for approximately $100 million over ten years, largely by expanding the capacity of existing schools. We recognize that this investment will not even enable Tanzania to meet its own Ministry of Health guidelines. The recent World Health Report 2006 estimates that the amount required to educate enough health care workers to meet WHO’s target (2.28 per thousand) would be closer to $1 billion.

However, this number was derived from an average cost of training health care workers across 57 countries identified as having a critical shortage of HRH, and used a different grouping of health care cadres (doctors, nurses and midwives) from the cadres we identify in this report. Our calculations are based on our case study of Tanzania.

In any case, we believe that doubling Tanzania’s training capacity will go a long way towards addressing the crisis. Doing so would enable an increase from 9,000 students in training annually (i.e., approximately 3,000 HRH graduates in all categories per year) to 18,000 in training annually (i.e., approximately 6,000 HRH graduates per year) by 2015. Those numbers provide for triple the number of skilled HRH – medical officers and AMOs – from 1,000 to 3,000, annually. Further increases in HRH training will, we believe, require investment in new schools.

**Necessary government support is available**

TOUCH’s aspiration to double HRH training capacity in Tanzania by 2015 has been shared with, and endorsed by, President Jakaya M. Kikwete of Tanzania and the Minister for Health, Professor David H. Mwakyusa, who tell us that our aspirations are shared by the Tanzanian government. In these meetings, as well as in discussions with other Tanzanian government members and officials, we have received strong endorsement for our approach. This support is, we believe, critical to ensuring successful implementation of a comprehensive HRH training program.

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In summary, using Tanzania as a case study, this report concludes that the only effective means of really addressing the HRH challenge in poor countries is to begin to immediately scale up training capacity, and that approach is relatively inexpensive when compared to its long-term benefits.

We estimate it will take at least a decade to begin to achieve meaningful – i.e., 100 percent – increases in training capacity. Because of the long lead times required to expand the
training in HRH, and even longer lead times for those HRH to enter service, this report urges that the global public health community should make HRH training a top priority. In parallel, other critical HRH issues such as productivity and retention should also be addressed, and these other issues will become more and more challenging once the overall number of HRH in service improves. However, we believe that, given the lead times, the right approach now is to focus on HRH creation while developing parallel strategies to deal with the other issues.
Tanzania’s health care crisis is acute

The health care crisis in Tanzania is particularly acute relative to other countries. The average Tanzanian now lives for barely half as long as the average American, and for 25 years less than residents of lower-middle income countries. Even relative to comparable low-income countries (defined by the World Bank as having per capita income of less than $745) such as Kenya, Uganda, and Cambodia, Tanzania’s health care crisis is unusually severe. Average life expectancy across all low income countries is now 59 years, 25 percent higher than in Tanzania.

A number of both communicable and non-communicable diseases are driving the health care crisis in Tanzania. The country’s 
HIV/AIDS infection rate is around eight percent of the population. 
HIV/AIDS represents the largest single disease burden in Tanzania, accounting for 24 percent of losses in Disability Adjusted Life Years.

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Exhibit 2
Tanzanian life expectancy

Tanzania average vs. comparable countries, 2001

Average life expectancy

<table>
<thead>
<tr>
<th></th>
<th>Average years, 1985-2005</th>
<th>Tanzania</th>
<th>Low income countries*</th>
<th>Low middle income countries*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td></td>
<td>54</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td>52</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td>48</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td>44</td>
<td>44</td>
<td>59</td>
</tr>
</tbody>
</table>

-8 years

- The World Bank classifies low middle income countries as those having GNI per capita between $745 and $2,975; and low income countries as those having GNI per capita less than $745; Tanzania is classified as a low income country.


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Case Study: Tanzania

Tanzania, a nation of some 38 million people, is in the midst of a severe health care crisis. Life expectancy in the country fell dramatically over the past two decades, erasing gains achieved in the years following independence (Exhibit 2). From 1965 to 1985, the lifespan of the average Tanzanian increased from 44 years to 52 years. According to the World Bank, over the subsequent twenty years, life expectancy retreated by 8 years, returning to the levels of four decades earlier (Exhibit 3).
Life Years (DALY). Based on WHO statistics and *Original Global Burden of Disease* estimates, tuberculosis and acute respiratory infections and malaria represent thirteen percent of DALY loss respectively, while malaria and maternal/perinatal conditions account for a further ten percent each (Exhibit 4).

The impact of most of Tanzania’s primary disease burdens could be dramatically reduced if appropriate diagnosis and treatment were available. In Tanzania, the key bottleneck preventing effective health care delivery is not drugs or facilities, but rather the supply of HRH. In fact, the availability of drugs such as anti-retroviral HIV/AIDS medications in Tanzania has improved substantially in recent years. While temporary shortages still occur, the combination of international donor support and low-cost generic alternatives ensure there is a reasonably sufficient supply of key drugs that the Tanzanian government manages through a central drug distribution system.

Part of the reason that the supply is sufficient, of course, is that there is a shortage of HRH who can diagnose and prescribe appropriate drugs to patients needing them.

Exhibit 4

**Top 10 causes of DALY* loss**

Percent of deaths, Tanzania, 2002

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>24%</td>
</tr>
<tr>
<td>Maternal and perinatal conditions</td>
<td>13%</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>10%</td>
</tr>
<tr>
<td>Injuries</td>
<td>10%</td>
</tr>
<tr>
<td>Malaria</td>
<td>7%</td>
</tr>
<tr>
<td>Neuropsychiatric conditions</td>
<td>4%</td>
</tr>
<tr>
<td>Nutritional deficiencies</td>
<td>3%</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>2%</td>
</tr>
<tr>
<td>All others</td>
<td>20%</td>
</tr>
</tbody>
</table>

Total = 20,235

* Disability Adjusted Life Years

Source: WHO Death and DALY estimates for 2002 by cause for WHO Member States; Annual Report, 2004, Mwanza region
In the 1970s and 1980s, Tanzania made significant investments in health system infrastructure and staff as part of a health care policy for the entire country. This proved to be financially unsustainable and possibly helped contribute to Tanzania’s default on its debt in the early 1990s. This in turn led to sanctions, including a public sector employment freeze that served to actually reduce HRH supply considerably while also creating a demographic gap in the age of its health care workers.

Tanzania began health sector reforms in 1993; an HRH policy and strategic plan were formed, and a revised National Health Policy was completed in 2002. In the Ministry of Health’s Health Sector Reform Plan of Action 1996-1999, the Tanzanian government envisioned that, after the reform, it would have

‘...a health sector that is efficiently managed, well organized and restructured. The required drugs and medical supplies will be available at all health facilities for a reasonable price. A sustainable health financing mechanism is evolved and the health workforce is motivated and productive.’

As part of these efforts, Tanzania has developed a complex referral system intended to coordinate health care delivery throughout the country (Exhibit 5). The network of health care facilities constructed to support this referral system – ranging from dispensaries in rural villages to national tertiary hospitals – is designed to support both local delivery and referral of appropriate cases to facilities with appropriate capabilities.

As a result, it is a source of great pride that no Tanzanian lives further than 10 km from some form of health care center. Unfortunately, while the physical infrastructure exists, few of

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**Exhibit 5**

**Types of facilities**

<table>
<thead>
<tr>
<th>Healthcare facility</th>
<th>MO (physician)</th>
<th>AMO (clinical skills)</th>
<th>Lab technician, etc.</th>
<th>CDO (basic clinical skills)</th>
<th>Nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 national tertiary care centers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 regional hospitals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>183 district hospitals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>479 health centers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,380 dispensaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Interviews, HERA, Technical Review of Health Service Delivery at District; 2001-02 Census Ministry of Health Tanzania
The shortage is even more dramatic when assessed against recommended staffing levels based on critical disease interventions. According to a study conducted by the London School of Hygiene and Tropical Medicine (LSHTM), Tanzania’s HRH supply would need to increase by more than 58,000 to provide necessary interventions to meet Tanzania’s disease burden.

The shortage of health workers in Tanzania is particularly acute relative to other countries. Tanzania’s 25,000 skilled HRH would need to increase by more than 30 times to match the skilled HRH density per capita of the United States, according to both LSHTM and the U.S.’s own Bureau of Labor Statistics. Even South Africa, a country whose own health care problems generate significant international attention and donor support, has a skilled HRH density ten times that of Tanzania, based on a 2005 report by the Health Professionals Council of South Africa (HPCSA), *Health Care Workforce in South Africa*.

More disturbingly, Tanzania’s HRH supply is significantly below that of comparable low income countries. Kenya, Tanzania’s neighbor to the north, has substantially more skilled health workers despite having a marginally smaller population. Kenya’s per capita income of $460 is slightly higher than Tanzania’s $320, according to the 2005 issue of *World Development Indicators* by the World Bank, but Kenya’s skilled HRH density is more than three times that of Tanzania. Indeed, the skilled HRH disparity on a population-adjusted basis between Tanzania and Kenya is comparable to that between South Africa and the United States (*Exhibit 6*).

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*Exhibit 6*

**Comparison of skilled HRH*  
2005 skilled HRH, 000**

<table>
<thead>
<tr>
<th>Country</th>
<th>2005 Skilled HRH</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>7,810</td>
</tr>
<tr>
<td>South Africa</td>
<td>255</td>
</tr>
<tr>
<td>Kenya</td>
<td>80</td>
</tr>
<tr>
<td>Tanzania</td>
<td>25</td>
</tr>
</tbody>
</table>

* Excludes ~19,100 medical attendants who are unskilled workers

Source: US Bureau of Labor Statistics; US Census Bureau; Health Professionals Council of South Africa; CIA World Factbook; Tanzania Census 2001-2002; London School of Hygiene and Tropical Medicine (LSHTM); Interviews; McKinsey analysis

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these facilities are staffed with the skilled health workers necessary to deliver critical interventions, and most of them lack the necessary medical equipment.

As a result, medical facilities that are adequately staffed attract patients from a far wider geography than anticipated, often skipping steps in the referral process.

**There is a significant HRH shortage in Tanzania compared to neighboring countries**

By all measures, Tanzania has a striking shortage of skilled HRH. Virtually all health care facilities in the country are significantly understaffed, according to the minimum guidelines established by the Ministry of Health. Few health care facilities meet these minimum guidelines, and the overall health care network is short by more than 24,000 people.
The health system pyramid is extremely thin at the top, especially when compared to neighboring countries. Indeed, Tanzania’s supply of physicians and AMOs combined is substantially lower than the number of physicians alone in either Kenya or South Africa. South Africa, whose population is twenty percent larger than that of Tanzania, has more than twenty times as many physicians as the number of medical officers and AMOs combined in Tanzania, and few argue that South Africa is well served in health care. Even Kenya, with a marginally smaller population than Tanzania, has over five thousand physicians compared with 1,900 medical officers and AMOs in Tanzania (Exhibit 7).

**Exhibit 7**

**Comparison between countries**

![Graph showing comparison between countries](image)

**Source:** Ministry of Health Census 2001-2010; Kenya Health Sector Review; Health Professionals Council of South Africa; US Bureau of Labor Statistics; US Census Bureau; CIA World Factbook; London School of Hygiene and Tropical Medicine; Interview; McKinsey analysis
Tanzania lacks sufficient skilled HRH across most cadres, but there is a particularly acute shortage of higher skilled workers. Of the 25,000 skilled HRH in Tanzania, fewer than one thousand are physicians—excluding both specialist and generalist medical officers—and many of these are in government positions, serve as administrators or work for non-governmental organizations, and therefore not directly providing patient care.

Another thousand are advanced non-physician clinicians (AMOs) who are able to perform roughly 60-80 percent of the clinical work of doctors. The remaining 23,000 are a combination of technicians, nurses and clinical officers, those who perform basic clinical work in smaller health facilities. In addition, there are some 20,000 largely untrained medical attendants who will be phased out over time as better skilled HRH become available.

As a proportion of their skilled HRH populations, both Tanzania and Kenya have disproportionately fewer higher skilled health workers relative to other cadres. Only seven percent of Tanzania and Kenya’s HRH supply are higher skilled workers, compared with thirteen percent in South Africa. While South Africa, through the HPCSA, frequently cites its own doctor shortage relative to the developed world, the percentage of South Africa’s health workers who are physicians is actually almost twice as high as its African neighbors.

**Higher skilled cadres should therefore be a central priority for investment**

Given the overwhelming shortage of higher skilled health care workers in Tanzania, skilled clinicians should be a central priority for investment in training HRH. Indeed, Tanzania would need to dramatically increase its supply of higher skilled health workers to reach the levels of other countries (Exhibit 8). On a population-adjusted basis, Tanzania would need to triple its supply of physicians and AMOS to match Kenya’s higher skilled HRH density. Reaching the skilled HRH density of South Africa, according to the HPCSA, or the U.S., according to LSHTM, would require Tanzania to increase the number of physicians and AMOS by seventeen times and 49 times respectively. These are clearly unrealistic objectives for the foreseeable future.

The shortage of higher skilled HRH in Tanzania is particularly worrying given the critical role that physicians and AMOS play in training and delivering health care. Higher skilled health workers, and particularly physicians, are needed to supervise other doctors and lower
skilled workers – particularly when they are being trained. AMOs and CO training programs predominately use ‘on-the-job’ training in clinical situations. Trainee AMOs and COS thus work alongside physicians who provide supervision and guidance on correct procedures for diagnosing and treating patients.

The limited supply of physicians in Tanzania presents a critical constraint on the number of both higher and lower skilled HRH that can be trained in the country.

Focusing on expanding training for higher skilled HRH is also imperative for obtaining maximum leverage from the HRH pyramid. Beyond clinical supervision during training, higher skilled clinicians are also responsible for supervising lower skilled cadres on an ongoing basis. For some interventions, such as administering anaesthesia, lower skilled cadres can only perform certain tasks in the presence of physicians or AMOs. Having an adequate supply of physicians and AMOs therefore increases the productivity of lower skilled workers. Higher skilled HRH also have more robust diagnostics skills and therefore help ensure that patients receive appropriate treatments.

Within the higher skilled cadres, investing in training AMOs should be a particularly high priority. All AMOs have extensive clinical experience, serving first as COS and then completing further clinical training under the supervision of specialist physicians. AMOs can therefore do 60-80 percent of clinical work performed by physicians, including critical interventions such as caesarean sections and equivalent surgeries.

However, AMOs are not required to complete the three-year sequence of biomedical science courses required of physicians (i.e. medical doctors). It therefore takes significantly less time to train an AMO than a physician, meaning that an investment in AMO training of clinical officers, combined with an increase in training capacity for clinical officers and nurses, ensures a shorter lead-time for improvements in health outcomes. AMOs also receive a degree that is not formally recognized outside of Tanzania and, as a result, have lower emigration rates than physicians.

**It is difficult to ensure higher skilled HRH are distributed evenly**

In addition to its overall HRH shortage, Tanzania also faces a significant distribution problem for its limited supply. Roughly seventy percent of Tanzania’s population lives in a rural area, but most health workers are heavily concentrated in urban areas, and this is especially the case for higher skilled workers. According to the Ministry of Health, there are 53 physicians per million Tanzanians in urban areas, compared with only seventeen per million in rural areas. Similarly, Tanzania’s cities have 43 AMOs per million people compared with only sixteen per million in less populated areas (*Exhibit 9*).

While HRH densities for lower skilled cadres are largely the same across rural and urban regions, the substantial shortage of higher skilled health workers in less populated regions means that Tanzania’s large rural population generally does not have any access to health care when advanced clinical skills are necessary.

A variety of factors are likely to contribute to the difference in HRH densities for higher skilled health workers. For physicians, the disparity may be partly explained by the distribution of hospitals in Tanzania. Most physicians work in hospitals and most hospitals are in urban areas. However, the gap in AMO densities seems to reflect the broader challenge: convincing higher skilled workers to
accept the standard of living provided in rural areas while not necessarily providing the medical equipment they need to exercise their skills. Lack of electricity and running water, for example, may discourage skilled workers from accepting jobs in those locations.

It may be unrealistic for Tanzania to appropriately balance the distribution of higher skilled workers throughout the country over the short term. Improving health care in less populated areas may therefore require the country to target critical skills towards lower-skilled workers living in rural areas, and train them to treat or refer and transport the more complicated cases to larger communities where caseload and economics demand physicians. A functional transportation system will be critical to support the referral process; however, given the logistical difficulties involved, it seems clear that the requirement for continued service by COS, nurses and other-like categories in remoter areas needs to be supported. Even so, in the medium term, these transport challenges must be met.

**Addressing the shortage will take many years and require sustained funding**

Increasing HRH in Tanzania is a pipeline problem. The long duration of many HRH training programs prevents the country from rapidly expanding HRH capacity. Each medical officer must complete a five-year degree, and specializing in a particular field requires an additional three years of training. While AMO programs last for only two years, each AMO must first practice as a CO after completing a three-year CO training program. Trainee health workers are, therefore, not treating patients with their full set of capabilities until many years after enrolling in school.

The length of the HRH training pipeline in Tanzania is compounded by the lack of medical school faculty available to train additional HRH. As a result, Tanzania must either import the necessary staff or train a pool of new teachers sufficient to increase overall training capacity, just to jump-start the program.
Exhibit 10
Training pipeline

<table>
<thead>
<tr>
<th>MDs, Specialists</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic science</td>
<td>Clinical</td>
<td>Internship</td>
<td>Grad. training</td>
<td>Specialists/teachers</td>
</tr>
<tr>
<td>training</td>
<td>training</td>
<td>supervision</td>
<td>Supervision</td>
<td>Full treatment/teaching</td>
</tr>
<tr>
<td>Some treatment</td>
<td>Treatment and some supervision</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yr. 0</th>
<th>Yr. 3</th>
<th>Yr. 5</th>
<th>Yr. 7</th>
<th>Yr. 8</th>
<th>Yr. 10</th>
<th>Yr. 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO training</td>
<td>CO experience</td>
<td>AMO training</td>
<td>Specialist supervision</td>
<td>Specialist AMO work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(~5 years)</td>
<td>Clinical treatment</td>
<td>More advanced</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Source: MoH Information Bulletin on Schools Database, 2002; Interviews

As a result of these pipeline issues, addressing the HRH shortage in Tanzania will take many years and require sustained funding over time periods measured in decades or more (Exhibit 10). Even if Tanzania’s HRH training capacity were to double overnight, and the pipeline began to fill, it would take years for the first classes of graduates to enter the workforce. In reality, increasing training capacity itself will also take time, so expanding the HRH workforce in Tanzania will necessarily require a long-term effort.

Fortunately, health workers spend much of their time assisting with clinical tasks during their training, so they begin to see patients reasonably quickly and can make a significant improvement to health outcomes while undergoing training. But there is no quick fix to resolving the HRH crisis in Tanzania. The critical mass of future, skilled HRH workers who will drive the improvement of Tanzanian health care is currently attending primary school.

Tanzania’s future training output will fall well short of meeting future needs

Given Tanzania’s current training output and the time horizon necessary to expand training capacity, Tanzania’s future HRH supply will fall far short of meeting future needs. Across all cadres, there is currently an aggregate training capacity for 8,700 students in Tanzania. Of this capacity, only 1,100 is for higher skilled workers, with an annual output of three hundred higher skilled graduates. Lower skilled training capacity is 7,600, with an annual graduation output of 2,500.

According to our analysis of a variety of data sources, based on the above current training outputs the base number of skilled HRH in the workforce will grow from 25,000 today to 30,000 by 2015, adjusted for expected attrition rates. Only 1,900 of the current 25,000 HRH are higher skilled physicians and AMOs, and only nine hundred incremental higher skilled workers are projected to be in the workforce over the next ten years. The remaining 23,000 current HRH are lower skilled workers, and include COs, nurses, and technicians. The
supply of these workers in the base case is expected to grow by only 4,100 over the next ten years.

Given population growth rate projections, Tanzania will actually experience a decline in HRH on a per capita basis, despite these overall increases in the health care workforce, as its projected population increases to 50 million (through high birth rates). As a result, Tanzania’s already critical shortage of HRH per capita will only get worse over the coming decade. By 2015, Tanzania will fall short of meeting its own minimum Ministry of Health staffing guidelines – by a total of 35,000 HRH, including a 2,300 shortage for the critical higher skilled cadres (Exhibit 11). The base case HRH gap for providing necessary disease interventions, defined by LSHTM, will grow to 110,000 over the next decade. This gap includes 9,800 higher skilled workers.

As a result, as an unmanaged outcome, Tanzania’s health care crisis will continue to worsen over the coming decade.

**Tanzania is well-positioned to address its HRH shortage**

While Tanzania faces a substantial future shortage of skilled health workers, given current training projections, the country is well-positioned to make dramatic progress in HRH supply if it makes HRH training a national priority and if it receives the necessary outside assistance.

In particular, several factors make Tanzania an excellent partner for donors and NGOs to assist in building skilled HRH training capacity (Exhibit 12, over). Within sub-Saharan Africa, Tanzania stands out as a peaceful country, with a relatively stable democracy and little ethnic conflict. The Tanzanian government recognizes the importance of improving health care and expanding the supply of skilled HRH, and has officially committed itself to address the skilled health worker shortage. Tanzania also has particularly strong relationships with key governments, donors, and agencies who could serve as potential partners in expanding HRH training capacity.

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**Exhibit 11**

**HRH in Tanzania by skill level, 000**

*Higher skilled includes Specialists, MOs, and AMOs*

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*Published by the Tanzanian MoH
**LSHTM analysis on HRH required

Source: Ministry of Health Census 2001-2002; London School of Hygiene and Tropical Medicine (LSHTM); Interviews; McKinsey analysis

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McKinsey&Company
Social and political factors make Tanzania a good place to invest in training HRH, as well as the fact that building training capacity in the country is also highly cost-effective. The cost of running education programs in Tanzania is a fraction of the cost in the developed world (Exhibit 13).

While it is difficult to quantify accurately, studies indicate the average cost of educating one doctor in the US ranges from $400,000 – $640,000, whereas training a doctor in Tanzania can cost as little as $30,000 – $40,000 (using BUCHS projections). A $100 million investment in the U.S. will generate 150-250 doctors; the same in Tanzania could produce over 1,500 doctors. Educating a doctor in Tanzania, therefore, is around sixteen times more efficient than doing so in the U.S. Expanding training in Tanzania is also cost-effective, even relative to other parts of Africa. A study by the African Union estimated that the average cost of training a doctor in Africa is around $50-60,000, or 1.5-2 times as expensive as in Tanzania. The
estimated cost at BUCHARIS is $30-40,000 per graduated student, once the school is at full capacity by 2010.

Tanzania’s large patient caseload also ensures that health workers training in Tanzania gain significant exposure, learning to diagnose and treat a large variety of critical diseases and to handle a large volume of total cases. As part of their clinical training, Tanzanian medical students work alongside physicians to treat a larger number of cases with fewer resources than those seen by students in developed countries.

This substantial availability of caseload, coupled with the cost-effectiveness of running education programs in Tanzania, offers the possibility of turning today’s disadvantage into a comparative advantage over a long period of time (considering the severe shortage faced by Tanzania over the medium term). Countries such as the Philippines and India are already demonstrating that this is possible (Exhibit 14). In the Philippines, the government has, in the past, encouraged overproduction of nurses for export – despite the recent appearance of negative impacts in domestic HRH availability – but partly in order to capture remittances from expatriate workers. India is fast capitalizing on a new trend for medical tourism, offering major procedures at a fraction of the price in the U.S.

While it is unlikely that Tanzania will ever have an excess of health care workers, the comparative advantage of developing countries in HRH training is clear. What is required is a combination of sustained commitment by the Tanzanian government and donors to build the quality and quantity of skilled HRH training institutions. If this commitment is met, Tanzania could potentially serve as a regional center of excellence in the field of health worker training and be ideally situated to address the overall shortage in sub-Saharan Africa, including training residents drawn from other African countries.

In addition to the favorable political situation and good partnerships with other organizations, Tanzania’s low emigration rate also makes it an ideal place to invest in HRH training. A 2002 WHO study in six sub-Saharan African countries, *Wastage in the workforce – some perspective from African countries*, estimated that health workers intend to emigrate at rates ranging from 26 percent in Uganda to 68 percent in Zimbabwe (Exhibit 15, over). A variety of sources, such as the
Exhibit 15
Proportion of HRH who intend to emigrate
Percent

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zimbabwe</td>
<td>68</td>
</tr>
<tr>
<td>Ghana</td>
<td>62</td>
</tr>
<tr>
<td>South Africa</td>
<td>58</td>
</tr>
<tr>
<td>Cameroon</td>
<td>49</td>
</tr>
<tr>
<td>Senegal</td>
<td>38</td>
</tr>
<tr>
<td>Uganda</td>
<td>26</td>
</tr>
<tr>
<td>Tanzania</td>
<td>&lt;20</td>
</tr>
</tbody>
</table>

Source: WHO AFRO 2002; Wastage in the health work force 2005; SADC 2005; Interviews

particularly if the government works in parallel to improve pay and working conditions.

However, outside assistance is critical to enabling rapid progress to be made in training skilled HRH. Without substantial outside assistance, it is hard to see how Tanzania can make progress much beyond the current situation. In particular, in addition to money, our research suggests that Tanzania needs additional managerial capacity to overcome bottlenecks and to accelerate capacity building, curriculum development and training methodologies, as well as international faculty from the developed world to train medical officers who, in turn, can train others.

2004 Ministry of Health report *Human Resources for Health Country Experience: Tanzania*, indicate that Tanzanian HRH emigration rates are likely to be less than twenty percent. The ‘brain drain’ of health workers seems therefore to be a lesser problem in Tanzania, and does not currently contribute significantly to the HRH shortage as in other countries.

A number of factors may account for the relatively low HRH emigration rates in Tanzania. The country’s political stability and lack of severe ethnic conflict likely reduces the desire of educated professionals to flee the country. Tanzania also has a strong national culture that, coupled with the relatively low cost of living, makes it a desirable place to live. Considering these factors, it is reasonable to expect that, as training capacity is expanded, the majority of skilled HRH trained in-country will remain in Tanzania and contribute to the nation’s health care recovery.
Meeting the Challenge Outside Tanzania

We are aware of the difficulties of extrapolating from a single country to the HRH issues facing poor nations around the globe. To a large degree, health care issues are local and reflect differences caused by geography, income levels, available HRH supply, national culture, governance policies and disease incidence and prevalence, among other causes of variation. Tanzania, for example, is very rural, very poor, suffers from chronic drought conditions in much of the country, and has an extreme shortage of HRH – particularly skilled HRH – even relative to most other poor nations. It has a lower prevalence of HIV/AIDS. It also benefits from relative social stability and an enlightened government, which makes it easier for donors to provide assistance.

However, despite these differences, we believe there are some potential insights from examining the Tanzania case which may be applicable elsewhere. In particular, the very fact that Tanzania has such an extreme shortage of skilled HRH and very high death rates, despite the relative low incidence of HIV/AIDS, helps prove how critical skilled HRH are to health care delivery and outcomes.

Our study indicates that investing $100 million in skilled HRH training in Tanzania will have a greater impact upon DALY (albeit with a time lag) than investing $100 million in any other aspect of health care assistance (Exhibit 16). Clearly, money should not be the constraint in any program to expand HRH training. Additionally, although the data is insufficient, we also believe that this observation likely applies to all poor nations with a shortage of skilled HRH. A nation such as Kenya, despite having better HRH density than Tanzania, would surely benefit enormously from having a much larger number of well-trained HRH to leverage.

The health care crisis in the developing world is partly a distribution problem

Drugs, facilities, and HRH are all critical components of a well-functioning health care system. Drugs and medical supplies are
HRH shortage drives other health issues

Human Resources for Health
- Specialists
- MOs
- Nurses

Facilities
- Hospitals
- Rural health centers
- Dispensaries

Drugs/supplies
- ARV
- Antibiotic
- Anti-malarial

Improved Health Services

Essential for treating HIV/AIDS and other diseases that cause suffering in developing countries. However, we, along with a growing number of public health practitioners, believe that a lack of sufficient HRH is the primary bottleneck for scaling up health care delivery (see, for example, the 2006 World Health Report; vol. 364 (9449) of Lancet; the JLI report, Human Resources for Health: Overcoming the Challenge, etc). Without health care workers, adequate distribution of health care simply does not exist.

Numerous NGOs are working to expand the supply and distribution of essential drugs. Many of these organizations identify the HRH shortage as the primary bottleneck to scaling up their efforts. Increasing drug supply will have limited impact without sufficient HRH to accurately diagnose patients and administer treatment.

Health care facilities are also a critical component of a health care system, but often there is not enough HRH to staff the existing facilities and to serve nearby populations. It is therefore important to first focus efforts on the pipeline problem: increase the number of HRH available to staff the facilities before investing too much, too quickly, to expand the number of health care facilities which cannot be adequately staffed.

Availability of HRH is the primary bottleneck for scaling up health care delivery in the developing world, and not coincidentally it is the component of the health care system that has historically received the least attention and investment. No significant progress on any other health issue can be made until the HRH shortage is addressed (Exhibit 17).

Importing HRH on a large scale from abroad is not a cost-effective solution

One theoretical approach to alleviating HRH shortages in the developing world is to rotate large numbers of trained HRH from developed countries into regions of greatest need, usually for short-term commitments of one to three years. However, this approach is neither cost-effective nor sustainable as a substitute for increasing HRH capacity in-country.

To deploy a volunteer (let alone someone expecting to be fully compensated) from the developed world (typically, the U.S., Canada, Europe, or Australia) requires provision of a salary stipend, housing, personnel support and transportation at developed world standards. These costs can reach $75,000 per year, or more, incurred annually for the entire duration of time spent in-country, suggest the authors of Healers Abroad: Americans Responding to the
Human Resource Crisis in HIV/AIDS. Non-volunteers (i.e. those receiving compensation) are likely to demand at least twice the local salary and in some cases much more, both increasing costs and distorting the HRH market.

When considered in the context of the severe HRH shortage that exists in developing countries, the logistical challenges involved and the sheer number of people to deploy could be similar to the U.S.’s task in mobilizing soldiers for the war in Iraq. Considering that, in Tanzania alone, over 35,000 additional skilled HRH are needed by 2015 just to meet minimum standards, we think that it is simply not possible to solve the crisis by importing HRH from rich countries, even if the some $3 billion required annually to do so were forthcoming. Furthermore, even if the task were complete, when those HRH returned home they would take with them all the skills, learning, and experience gained throughout their clinical work and leave their host country in much the same position as before.

Since training HRH in sub-Saharan Africa costs less than $8-12,000 per year for a physician and potentially less than $2-3,000 a year for other HRH – less than ten percent of what is costs in the developed world – it seems only sensible to train HRH locally (Exhibit 18). When training is complete, local HRH will provide career-long care for the community, provided they are given reasonable pay and working conditions. Furthermore, as they gain experience from their clinical work, they will be able to reinvest this knowledge into their home country, not only by providing the community with more advanced levels of care, but also by training new health workers.

From the point of view of maximum cost-effectiveness and sustainability alone, training local health care workers is, in our view, the only real solution to addressing HRH shortages in developing countries.

Exhibit 18
Comparison between training and deployment

$000

<table>
<thead>
<tr>
<th></th>
<th>$000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deploying an in-country volunteer, per year</td>
<td>75</td>
</tr>
<tr>
<td>Training a health care worker in Tanzania, average weighted cost</td>
<td>10</td>
</tr>
</tbody>
</table>

7.5x cheaper

Comparative advantage in the developing world

The developing world has a comparative advantage over the developed world for training HRH in-country, not just in costs, but also in clinical case load. Most poor nations, unfortunately, offer an abundance of the case load necessary for clinical training. Doctors trained in poor nations see a much higher volume of cases every day compared to those trained in the developed world, and often experience greater clinical variety. One doctor working in Bugando suggested that ‘...students here see dozens of cases everyday that were rare during my training in Germany.’ As a result it seems that the potential for quality clinical training in the developing world can be in some ways superior to that of the developed world.

Based on case load advantage, selected poor nations which focus on HRH training could one day grow into global centers of excellence for training HRH, and thereby assist in enabling a more efficient global HRH market.

An HRH system requires a well-balanced pyramid

All types of HRH are important for a well-functioning health care system, and shortages in each cadre need to be addressed. The best
Exhibit 19
Training higher skilled HRH is critical

Higher skilled
- Necessary to train other HRH
- Enable optimal pyramid by supervising lower skilled cadres
- Critical for accurate diagnosis

Technically skilled
- Perform essential diagnostic and treatment interventions, such as lab work and drug distribution

Lower skilled
- Perform basic interventions for prevention and treatment
- Distribute bulk of health care in underserved and rural regions

Typical HRH pyramid
Preferred HRH pyramid

A typical skilled HRH workforce is comprised of lower skilled HRH, technically skilled HRH, and higher skilled HRH. Each type of skill is important. The lower skilled HRH (such as nurses and clinical officers) are essential since they have the basic skills necessary for prevention and can provide treatment at local health care facilities. As such, they often provide the population with critical early health care interventions, administer diagnostic tests, and perform on-going treatment (e.g., HIV/AIDS drug regimes).

Technically skilled HRH (lab technicians, dentists, pharmacists, etc.) perform essential diagnostic and treatment interventions, such as lab work and drug distribution. They ideally would be available in almost all referral health care facilities for accurate initial diagnosis and treatment.

Meanwhile, higher skilled HRH are essential for diagnosis and treatment of the most advanced medical cases. They can also enable the conditions for an optimal HRH pyramid by supervising the lower-skilled cadres in performing important tasks.

Finally, the most highly-skilled HRH are necessary to train all others (e.g., specialists to train physicians, while physicians train physician equivalents, etc.). It therefore makes sense to focus on increasing training capacity for higher skilled HRH as rapidly as possible in order to create the capacity for lower-skilled training programs (Exhibit 19).

Long lead times are necessary

Health care in the developing world is not in a state of a short-term emergency, but is in a sustained crisis. To create a well-trained, appropriately balanced HRH pyramid first requires an increased supply of doctors. But to substantially increase the supply of physicians in a developing country, one must first train a supply of medical school teachers in order to increase the training capacity of existing medical schools, let alone staff new ones.
Unfortunately several years are required to build, scale, and accredit a new medical school. Training the first class of physicians from a new school can take 5 to 7 years, including internship and residency programs. This group of physicians would then need to be trained as clinical faculty, requiring another 2 to 4 years. Only then can these medical faculty be dispersed into additional medical schools, each of which can now train another generation of HRH. Taken together, this process of expanding training capacity by building new schools will take many years, assuming a sustained funding commitment over a decade or more (Exhibit 20).

This means that rather than beginning by starting new medical schools, the first step should be to expand existing medical schools up to their caseload capacity. Unlike starting a new school, it is relatively easy to add dormitories and classrooms. Attracting sufficient faculty is harder. We believe that the only short-term answer, while simultaneously expanding the training of faculty locally, is the importation of faculty from the developed world. This is one area where expatriate volunteers are really needed, particularly those willing to commit to a year or more. Acquiring the faculty to train new doctors is the critical initial step in expanding the capacity of the entire HRH pyramid, and it is hard to see how this can happen in a poor nation without outside help.

Another critical bottleneck is management capacity

Skilled on-the-ground managers who can first identify and problem-solve bottlenecks in the HRH training pipeline, and then go about taking the necessary action, are necessary for increasing training capacity. However, this type of management capacity in developing countries is in extremely short supply, particularly in the field of health care. Individuals with public health experience coupled with management skills are almost non-existent, except for those few who have gained these skills through practical experience.
Management capacity is the primary bottleneck

How bottlenecks in the HRH training pipeline could be solved by skilled managers:

- **Supply of qualified students**: Ensure government effectively invests in education.
- **Supply of medical cases for training**: Help plan effective expansion of schools by problem solving on maximum potential training capacity.
- **Capacity of training institutions**: Lower costs of expanding training capacity by:
  - Uncovering unique bottlenecks
  - Monitoring spending
- **Good job opportunities**: Establishing a private health care chain can help develop private practice by:
  - Providing management capabilities
  - Subsidizing rural clinics
  - Providing quality assurance through standardization

Management capacity is often provided by physicians who graduate from the medical school but lack any formal management training, and putting them in management roles takes another health care provider away from clinical work. Our research indicates that there is significant opportunity to expand the HRH training capacity, for relatively modest investments by donors, if there was a sufficient number of trained administrators available to identify and address the bottlenecks as they appear (Exhibit 21). To us this makes the development of joint MBA/health care administration schools a priority equal to scaling existing and building new medical colleges, although the total number of managers needed is, of course, far smaller.

On-the-ground managers can greatly reduce the costs of increasing training capacity, and help avoid both waste and missteps. For example, managers can ensure the optimal geographic expansion of health care training by analyzing the maximum potential training capacity in each geography given the available caseload from nearby medical facilities. By identifying the bottlenecks for expansion that are unique to each school, managers can then target funds to cost-effectively manage the expansion of individual training institutions.

Bottlenecks in the training pipeline tend to be simple things such as numbers of dormitory beds, use of existing and creation of new classrooms, determining the need for additional faculty, etc. Management skills are required to identify and address these issues effectively, particularly when construction of new facilities is required or other support is needed.

Again, this is an area where donors and volunteers from abroad can make a difference while simultaneously assisting host countries to develop their local capabilities in health care management training. In the short term, however, our view is that there is no answer to the problem other than importing managerial skills from abroad until local managers can be grown.

**Retention is a major issue**

We agree with the prevailing view that HRH retention is a major issue. Efforts to increase training capacity in developing countries must go hand-in-hand with related efforts to ensure attractive employment opportunities for both existing and new health care workers. Good jobs are essential for keeping the total HRH
Good clinical jobs are critical

Creating attractive, sustainable healthcare jobs...
- With adequate compensation
  - On par with other good jobs in a given country
  - Roughly equivalent in PPP terms to opportunities in other countries
- With opportunities for professional development
- With a positive and professional work environment

...but also entire countries
- Create natural distribution of HRH around the country
- Stimulate economic development

...benefits not just HRH...
- Provide incentives necessary to deliver quality healthcare
- Provide attractive career path for educated people
- Reduce voluntary attrition of HRH

training pipeline flowing, for keeping emigration rates low, and for making existing HRH more productive.

Attractive and sustainable health care jobs must meet several criteria. First, compensation must be on par with other jobs for equivalently educated citizens of that country in order to provide an incentive for individuals to choose this career path. Compensation must also be comparable in purchasing-power-parity (PPP) terms (not necessarily absolute terms) with the developed world and employment opportunities abroad, to discourage trained HRH from emigrating abroad for higher pay. Our research suggests that, first, ensuring comparative PPP may not be as expensive as it sounds, since in a nation like Tanzania a $10,000 annual salary can provide an equivalent lifestyle to someone earning five to ten times as much in the developed world.

Second, jobs must offer opportunities for professional development, so that well-educated citizens can look forward to an attractive career path with strong opportunities for growth and leadership.

Third, jobs must offer a positive and professional work environment that enables health care workers to be productive in the delivery of high quality care to patients, since professional satisfaction is one of the most essential needs to ensure long term retention of HRH in clinical work.

If all of these criteria are met, then these jobs will not only help stimulate HRH supply, but can also lead to additional benefits for the host country (Exhibit 22). Medical practice in general can help provide good jobs, improve the quality of health care, and stimulate economic development across the country. By gradually improving pay, working conditions and productivity throughout the country, in parallel with increasing supply, it should be possible to overcome the HRH distribution problem between urban and rural areas, and drive a more natural distribution of HRH.

As developing countries build up their secondary schools and produce qualified candidates, it is essential that they find good jobs for these people if the nation is to benefit
from that education. Training skilled HRH and providing them with good jobs, therefore, has additional benefits in improving the quality of health care provided to local citizens. It also provides one of the foundational elements required to create a middle class of professionals, who can help serve as role models and community leaders.

Unfortunately, creating such jobs is challenging for many countries since the answers require the resolution of complex, inter-connected social, political, and economic issues. These answers are not readily apparent. We believe, therefore, that in addition to increasing training capacity for HRH, there is a great need for the global public health community to devote resources to determine how to create and sustain attractive HRH jobs. However, given the long lead times required to increase the supply of HRH, we conclude that it is imperative for the global public health community to make HRH training capacity a high priority while continuing to work on retention and productivity issues.
**TOUCH Foundation Strategy for Tanzania**

As a final note, we thought it would be helpful to share a high-level summary of the strategy recommended by the McKinsey project team to the TOUCH Foundation’s Board of Directors. The intent in sharing this strategy is to assist others concerned about HRH to think about how they could also assist poor nations to build HRH training capacity.

TOUCH is a not-for-profit corporation which adopts management practices as if it were a for-profit business. The overall strategy project proposed for TOUCH is for it to continue to focus on Tanzania rather than expand to other countries *(Exhibit 23)* and to do so while applying business metrics to its performance.

The reasons to stay with Tanzania are straightforward:

- Tanzania’s HRH shortage is extreme and the country is large enough to warrant significant investment.
- Assisting Tanzania address its HRH issues, as well as to address the significant issues of management support to help build up new training capacity, will require very significant funding over time.
- As a new foundation, it is improbable that TOUCH will have either the donor base or the management capacity to exhaust high return (in terms of DARY) investments in training Tanzanian HRH in the near future.

**Exhibit 23**

**Touch strategy — expand training at Bugando and throughout Tanzania**

<table>
<thead>
<tr>
<th>2006</th>
<th>2020</th>
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**Expand BUCHS and scale-up the Institute for Allied Health Sciences**

- Expand BUCHS MO college
- Launch post-graduate program
- Scale-up IAHS
- Gain experience and familiarity in expanding HRH institutions
- Plan for self-sufficiency

**Scale-up existing HRH schools**

- Create “management support team” to scale-up other schools by helping to address bottlenecks
- Fund one-time capital costs for scaling-up schools

**Build new HRH schools, primarily for lower skilled cadres**

- Build new HRH schools to increase training capacity
- Focus on lower-skilled cadres, especially clinical officers
- Leverage case-load of district and regional hospitals to build training capacity in rural areas
In our view, trying to focus on another country might dilute TOUCH’s ability to capture these high return opportunities.

- TOUCH’s opportunities in Tanzania are closely tied to the solid working relationships we have been able to develop with Tanzanians, both at Bugando and with members of the government. It may be difficult to replicate these relationships elsewhere.

- Tanzania has the potential to provide an unusually rich learning opportunity, for the potential is there to learn how to scale up HRH training in ways that may be transferable elsewhere.

Our belief that TOUCH should focus on Tanzania for now was reinforced by our meeting with President Jakaya M. Kikwete, who urged us to help raise the $100 million needed and to support his country’s efforts to double HRH training country-wide over the next decade. Similar encouragement was received from the Minister for Health, Professor David H. Mwakyusa, and the Minister for Science, Technology, and Higher Education, the Hon. Peter Msolla.

Based upon our work, the project team believes that, if TOUCH can raise the $100 million necessary, it can provide sufficient funding to enable Tanzania to both double its HRH training capacity by 2015 while laying the necessary foundation for increasing the capacity even further (Exhibit 24). The objective is no less than to enable Tanzania to become a center of excellence in HRH training in Africa. Our strategy contains three major components:

1. Invest in the Bugando health care complex (BMC, BUCHS, and IAHS) in Mwanza with the aspiration to assist it to become the finest single health care training center in East Africa by 2015, while simultaneously doubling its training capacity of all HRH cadres, adding graduate schools in medical specialties, and innovating in HRH training particularly to meet rural needs. This component is currently underway.

2. Enable other training centers in Tanzania to expand their capacities, and to upgrade the quality of the training to the fullest possible extent by providing these institutions with management capacity, problem solving assistance, and help in fundraising. This component is in early planning stages, with a view towards implementation in late 2007.

3. Build new schools and facilities around the most appropriate health care delivery centers, ensuring that appropriate caseloads are available, and train and staff these with a sufficient supply of practitioners and clinical faculty trained at BUCHS or elsewhere. We intend to begin planning this component in 2008, designed toward
building the first new school in 2010 (or whenever sufficient funding has been obtained).

We believe such aspirations, while ambitious, are not unrealistic given the way TOUCH intends to operate. In principle, it wants to seek impact for its donors in the same manner as a public company seeks profits for its shareholders. TOUCH is committed to doing so over the long term.
Selected bibliography


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