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Human Resources for Health in Tanzania: Challenges, Policy Options and Knowledge Gaps

Ottar Mæstad

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Contents

Preface

Shortage of health personnel and poor health worker performance are among the most pressing problems of health systems in low-income countries. Lack of personnel with relevant skills is a threat to the success of programmes intended for scaling up health services in order to reach the Millennium Development Goals.

The Joint Learning Initiative (2004) estimated the average number of health workers in sub-Saharan Africa to about one per 1000, compared to more than 10 per 1000 in developed countries. During the last decade the shortage of health workers has been magnified by a) the HIV/AIDS pandemic, which has increased the demands on the health care system at the same time as it has cut back on the stock of health workers b) the globalisation of the health workforce, causing a drain of health workers from poor countries, and c) lack of investment in human resources for health in the wake of structural adjustment programmes.

Despite increasing awareness of the human resource challenge at the international level, progress towards the implementation of relevant country actions has been slow in many countries. The Oslo Consultation on Human Resources for Health in February 2005 therefore stressed the importance of country-led action to address the issue.

NORAD commissioned the present study in order to learn how the human resource challenge currently is being addressed in Tanzania. Over the last few years, awareness has increased among policy makers in Tanzania that the country is facing a health worker crisis, and the Ministry of Health has initiated the development of a strategy to address the problem. A study of the ongoing process in Tanzania can provide useful insights for similar efforts in other countries. A second aim of the study was to identify knowledge gaps for the development of evidence-based human resource strategies in Tanzania. By structuring available evidence within a strategic policy framework, and by identifying key knowledge gaps, this study may serve as an input to the further efforts to strengthen the health workforce in Tanzania.

This report is based on literature reviews as well as interviews with key stakeholders in Tanzania during October 2005. The report has benefited greatly from the kind assistance of a number of people. The Appendix lists key persons to whom I am most grateful for their patience with my questions and for their generosity in sharing their time and thoughts with me. For useful comments on an earlier draft, I am grateful to Magnus Hatlebakk, Øystein Evjen Olsen, Bjørg Evjen Olsen, and Christoph Kurowski.

Bergen, 19.01.06

Ottar Mæstad

Executive Summary

Human Resources for Health challenges

There has been a sharp decline in the number of health workers in Tanzania between 1994/95 and 2001/02. Most of the decline has taken place in lower skilled cadres, a development that is in accordance with the 1996-2001 strategic plan on human resources for health. The present number of health personnel in Tanzania is low both by international standards and relative to national staffing norms. An even greater shortage of health workers is expected in the future, due to higher demands on the health sector (e.g., from HIV/AIDS care and treatment) and higher attrition rates as an aging health workforce will begin to retire.

Geographical imbalances – measured as differences in the number of health workers per capita across districts – are significant. But a comprehensive and critical assessment of the degree of geographical imbalances has yet to be conducted.

A few small-scale studies have suggested that the levels of productivity and performance among health workers are low. One study finds that only 57% of health workers' time is spent on productive activities and that there are large variations among facilities in this respect. There is also some evidence of low level of skills among clinicians and low motivation/effort to comply with professional guidelines in clinical work. This suggests that policies to address the human resource challenge in Tanzania cannot focus only on the total number of workers and their geographical distribution, but also have to address issues related to the performance of the existing workforce.

The Human Resource for Health policy process

The human resource situation of the Tanzanian health sector is recognised as a crisis by the political leadership. A number of factors have contributed to this understanding, including comprehensive data collection on the actual number of health workers in Tanzania, greater focus on the resource requirements needed to scale up HIV/AIDS care and treatment, increased attention to the results of development assistance among the development partners, and health workers themselves who lately have voiced their concerns more loudly than before.

Despite recent attempts to alleviate some of the acute problems related to human resources in health, the fundamental reasons for the crisis have yet to be addressed. Among the challenges in this process are the need to place the human resource issue higher on the agenda in national policy processes and documents, the need to address financial constraints, the need for further evidence on which policies are most effective in addressing the various aspects of the problem, and the need to strengthen the Human Resource Department of the Ministry of Health.

The choice of a Human Resources for Health strategy

An important challenge for health policy makers in Tanzania is to design a human resource strategy that appropriately reflects and responds to the current crisis. This report presents a framework that may form the basis for such a strategy process. It also presents the available evidence on the main strategic options that are available.

The two main options to strengthen the health workforce are to 1) increase the number of health workers, and 2) utilise available workers more effectively. The number of health workers can be increased through higher recruitment and/or retention rates. Recruitment of more health workers may be achieved either by increasing the training output, by employing currently inactive health workers in Tanzania, or by attracting health personnel from abroad.

In the long run, the number of health personnel cannot be substantially increased without an increase in training output. In the short run, however, it is less obvious which of the mentioned options that will be the most cost-effective one. The lack of tutors seems to represent a critical challenge for increased training output in the short run. With regard to recruitment of inactive personnel, recalculations of previous estimates on the number of trained health personnel working outside the Tanzanian health sector suggest that the number of inactive workers in clinical and nursing cadres may be as high as 54% of the current workforce in these cadres. But little is known about what it would take to attract these people back into the health sector.

Health workers' productivity and performance can in principle be improved either by strengthening the *enabling factors* (e.g., equipment and skills) or by giving incentives for increased *worker efforts*. The choice of appropriate policy measures will depend on which aspect of productivity and performance one is going to address and on the relative cost-effectiveness of various interventions. In Tanzania, there is scarce evidence both on which aspects of productivity and performance that are most crucial to address and on the impact of alternative policy measures. One study has documented that the incentive structure of health facilities has significant impact on clinical performance.

There are quite a number of funded but vacant posts in the Tanzanian health sector. Central recruitment of certain cadres has recently been reinstated in order to secure more rapid filling of vacant posts. It remains to be seen how effective such administrative measures turn out to be. A core underlying problem is that health workers are unwilling to work at some rural posts. Incentive schemes (pull or push factors) are probably needed in order to overcome this problem. The Mkapa Fellowship programme (voluntary bonding) represents a new attempt to create an incentive scheme for taking up rural posts.

Available evidence suggests that the skill mix of the Tanzanian health workforce is biased against skilled professionals. The share of unskilled workers has not yet been brought down to the targets defined in the 1996-2001 strategic plan for human resources. It is less obvious which of the skilled cadres that is in most scarce supply. Relative to staffing norms, the greatest shortages are found among Assistant Medical Officers, clinical officers and lab technicians. However, a study focusing on the skills needed to scale up priority interventions points at doctors as the most undersupplied cadre.

The benefits provided by increasing the supply of various cadres should be weighed against the costs. Costs can be reduced by compromising on the amount of pre-service training. Although such a strategy has been pursued in other sectors, this is probably a less suitable strategy for the health sector. Costs of training can also be reduced by reducing the emigration rates of graduates, for instance by developing curricula that are not fully accepted internationally.

The share of personal emoluments in recurrent expenditures has decreased from 64% to 29% over the last ten years, which is a reflection of a sharp increase in the health sector budget. If the health budget continues to increase, there seems to be scope for a substantial increase in salaries, at least for the skilled health workers. Financial implications of policy interventions to increase training and improve productivity and performance are rather uncertain.

Knowledge gaps

Despite several recent in-depth studies of the HRH situation in Tanzania, a number of knowledge gaps still need to be addressed in order to improve the evidence base for human resource strategies in the health sector. While additional evidence is needed both on the nature of the HRH problem and on which policies that might efficiently address the problem, knowledge gaps are presently largest when it comes to the effect of alternative policy interventions. We suggest structuring future research efforts around the set of available interventions within areas such as

- organisation, management and control,
- skill level and mix,
- salaries, rewards and incentive schemes,
- working conditions,

to try to identify the impact of various interventions on each of the strategic goals.

A multitude of research methods and approaches will be needed in order to address the knowledge gaps. Some of the most important questions can probably not be answered without an experimental approach where researches interact closely with policy makers in order to design experiments that are both scientifically valid and politically feasible.

1. Introduction

At the Joint Annual Health Sector Review in 2005, the Ministry of Health claimed that the health worker crisis in Tanzania has now reached emergency proportions.

The health worker crisis is showing up in shortage of personnel, geographical imbalances in the availability of health workers, and weak productivity and performance at health facilities. Shortages are expected to increase sharply in coming years, primarily due to the huge personnel requirements for care and treatment of people living with HIV/AIDS.

Government authorities seem to have realised that the health worker crisis is a fact and that time has come do address the problem. There is however little evidence to guide policy makers in the choice between alternative strategies and actions that may reduce the problem. While considerable amounts of evidence have been collected to document the nature and extent of the health worker crisis, much less is known about the effect and costs of alleviating policy measures.

This report summaries some of the main characteristics of the health worker crisis in Tanzania, based on a literature review (Section 2). It provides a brief introduction to the ongoing policy process on Human Resources for Health in Tanzania (Section 3). In coming months, the Ministry of Health is going to develop a strategy to address the health worker crisis. Section 4 illustrates how this strategy discussion may be organised and draws on available evidence to inform the choice between alternative strategies. Key knowledge gaps for the development of an evidence based human resource policy in the Tanzanian health sector are summarised in Section 5.

2. Human Resource Challenges

The availability of health workers in sufficient numbers, with adequate skills, and with the motivation needed in order to provide high quality services is a crucial factor for the functioning of any health system. The following observations therefore pose a major threat to effective health service delivery in Tanzania

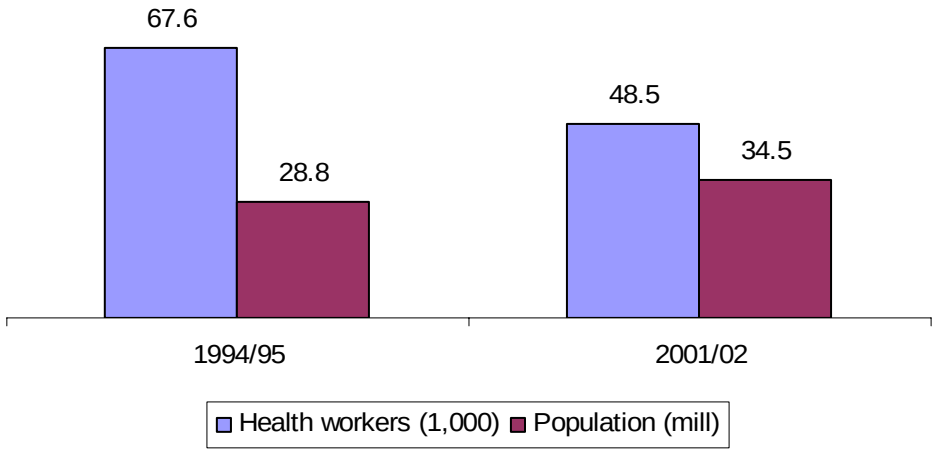
- The number of skilled health workers per capita is low and declining
- The number of skilled health workers in rural areas is disproportionally low, leading to inequitable access to health services.
- There is a high share of unskilled, or very low skilled, health workers
- The productivity and performance of health workers are inadequate

Reasons for these problems are manifold. They include low rates of recruitment, imposed through structural adjustment programmes, as well as increasing burden of disease due to HIV/AIDS, which both increases the demand on the health system and increases worker attrition rates. They also include problems with organisation and management of the health workforce, and last, but not least, they include a number of challenges related to poor working conditions, which induce educated people to seek employment outside the Tanzanian health sector and which de-motivate those workers who stay.

2.1. Shortage of health personnel

The total active health workforce in Tanzania is small and declining. The 2001/02 Census counted 48,500 health workers, down from 67,600 workers in 1994/95. Over the same period, population grew by 20%. The active health workforce per capita thus declined by 40% between 1994/95 and 2001/02 (down from 2.35 to 1.41 health workers per capita).

Figure 1. Sharply declining number of health workers, despite population increase



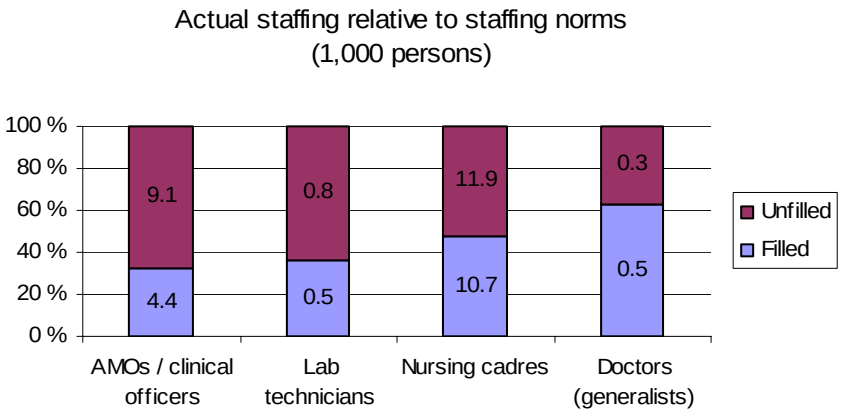
Source: HRH Census 1994/95. HRH Census 2001/02. World Development Indicators (2004).

Most of the decline in staffing levels is due to a reduction in the number of unskilled and low-skilled staff, which is in accordance with the 1996-2001 strategic plan for human resources

for the health sector (MoH, 1996). But the availability of skilled staff has also declined over the period; the number of clinicians and nurses has been reduced by 5%, amounting to a 20% reduction in per capita availability of skilled staff (Wyss, 2004).[1]

One way of assessing the magnitude of the health worker shortage is to compare actual employment with official staffing norms. In key cadres, such as nurses, clinical officers and laboratory technicians, employment in 2002 was 50% or less of the agreed staffing norms in 1999 (see Figure 2). Among doctors, the employment was slightly above 60% of the recommended level. The aggregate shortage in the cadres presented in Figure 2 is 19,000 health workers, implying that the average staffing level in these key cadres is only 45% of the norm. In lower cadres, though, there is reason to believe that there is an oversupply of workers relative to the staffing norms.[2] Ministry of Health has estimated that there is a shortage of 17,500 health workers *in the public sector* (Dominick and Kurowski, 2005). Like the figures presented above, this estimate does probably not adjust for the oversupply in lower cadres. In the *private not-for-profit* health facilities, actual staffing is estimated to 40% of staffing norms.[3][4]

Figure 2. Severe shortage of personnel relative to staffing norms in key cadres



Source: HRH Census 2001/02. Ministry of Health staffing norms from McKinsey (2004).

Shortages reported above are conservative estimates, because the staffing norms dating back to 1999 do not take into account the huge personnel requirements needed to roll out

[1] Here, skilled staff includes all clinicians, including assistant clinical officers, as well as professional nurses (a and b).

[2] Kurowski et al. (2004) estimate the total staffing level recommended by the staffing norms in the public sector to 40,000 full time equivalents. This compares with 35,100 public sector health workers in the 2001/02 HRH Census, implying a shortage of only 4,900 workers in the public sector. The discrepancy between this figure and the figures presented above can be explained by oversupply of lower cadre health workers.

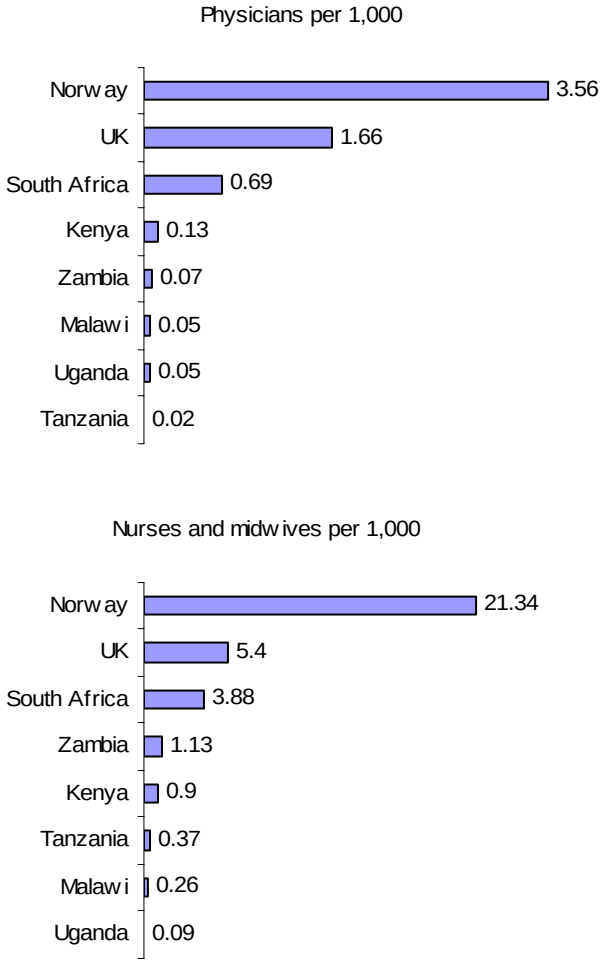
[3] Personal communication with Dr. Kimambo, Christian Social Service Commission.

[4] Available data are not rich enough to precisely estimate the relative shortage of personnel in the public sector relative to the private sectors. However, if we are willing to assume that public facilities on average require the same number of personnel as private facilities, the HRH Census 2001/02 combined with data on the number of facilities from MoH (2005d) will suggest that the relative shortage is considerably greater in the private sector (including not-for-profit facilities) than in the public sector. But part of this difference is probably due to the fact that the HRH Census did not cover all private facilities adequately (Kurowski, personal communication).

antiretrovirals to people living with HIV/AIDS. It is estimated the Tanzanian HIV/AIDS care and treatment plan will require almost 10,000 full time health workers (McKinsey 2004). Moreover, the population growth (amounting to 12.6% in the period 1999-2004) has further aggravated the shortage of personnel with thousands of health workers.

An alternative way of assessing the magnitude of the shortage of health personnel is through international comparisons. According to the Joint Learning Initiative (2004), Tanzania has the world's lowest coverage of physicians, with only 0.02 medical officers or specialists per 1,000 persons. This is an extremely low figure by international standards and is also significantly lower than in Tanzania's neighbouring countries (Figure 3). One should be aware, though, that several African countries employ health personnel that do not qualify as a doctor but nevertheless have substantial clinical skills. Tanzania has for instance about as many Assistant Medical Officers as it has Medical Officers. Assistant Medical Officers have almost the same qualifications as a Medical Officer, but they are not included in the official figures of the number of physicians. Due to the extensive use of substitute cadres in African countries, international comparisons of the size of the health workforce should be interpreted with great care.

Figure 3. Tanzania's health workforce is extremely small by international standards



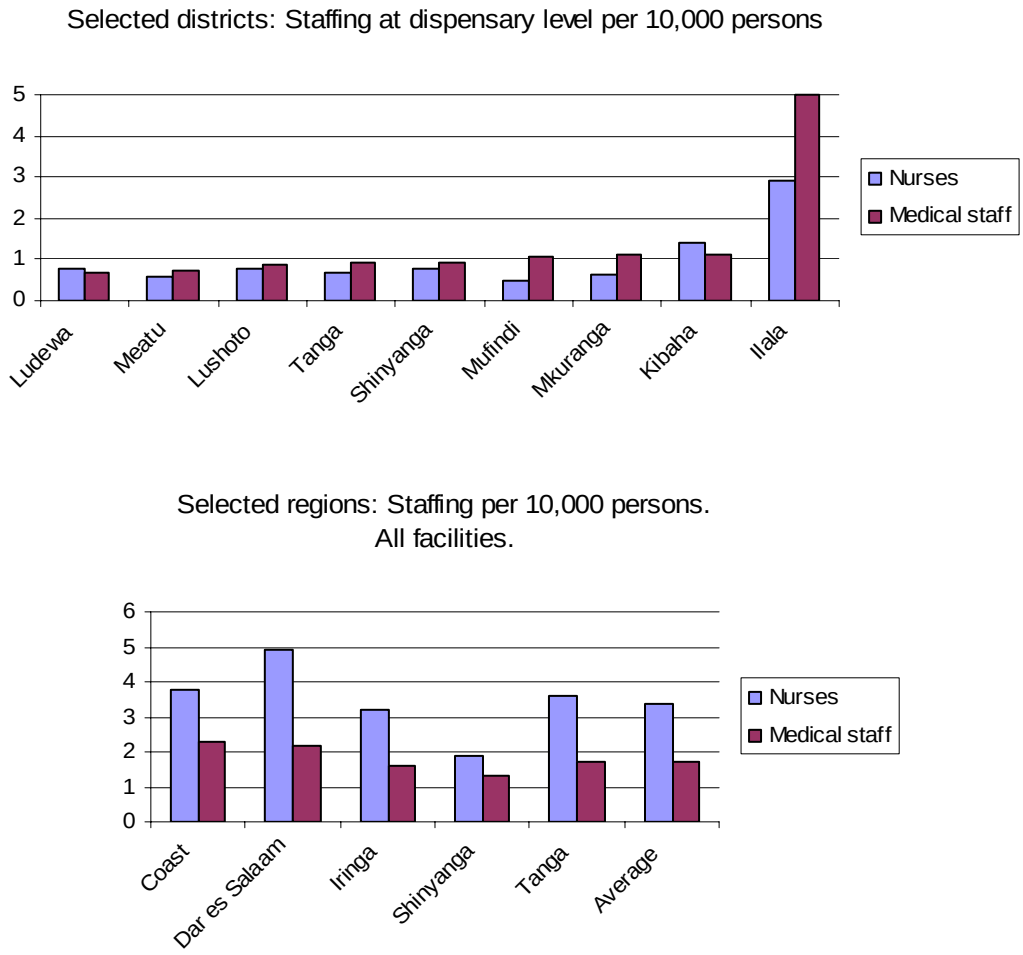
Source: JLI (2004).

Without countervailing actions, the health workforce is predicted to continue declining. Using conservative estimates of recruitment and attrition, Kurowski and Dominick (2005) estimate that the health workforce will decline to less than 40,000 in 2015. It is unclear whether this estimate takes into account the fact that the average age of health workers has increased significantly over the least decade. For instance, the share of health workers aged >50 increased form 5% in 1994/95 to 18% in 2001/02. This implies that natural attrition rates are expected to increase in coming years.

2.2. Geographical imbalances

There are significant differences in the number of health personnel per capita in different areas of the country. Differences in staffing levels are typically larger across districts than across regions, partly because some districts are hosting regional or tertiary hospitals with significantly higher staffing levels than ordinary district hospitals. Kurowski et al. (2004) corrected for this infrastructure effect by comparing staffing levels across districts at the dispensary level. They still found substantial geographical differences at the district level (see Figure 4). Not surprisingly, urban areas are overrepresented in the group with high staffing levels.

Figure 4. Substantial geographical imbalances in the health workforce



Source: Kurowski et al. (2004).

According to the Ministry of Health staffing norms, a dispensary serving a population of 10,000 persons should have two nurses and two medical staff (clinical officers). Against this background, the figure above also demonstrates the massive shortage of personnel at the dispensary level in most districts.

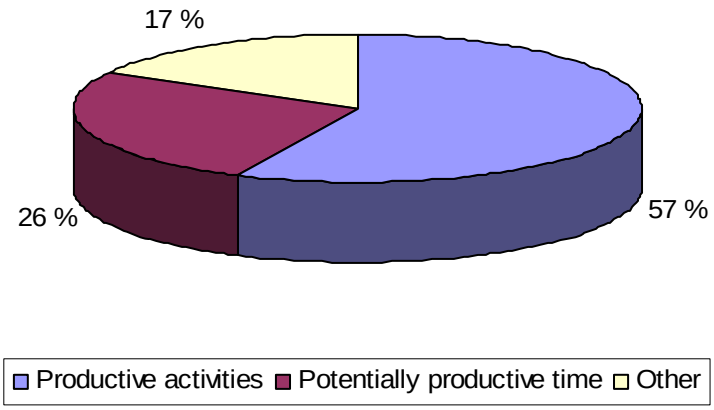
Figure 4 seems to suggest that the geographical imbalance is larger among nurses than among medical staff (although the observation from Ilala district is against this pattern). Nevertheless, the geographically most skewed distribution of health personnel is undoubtedly found in the medical doctor's cadre. While Dar es Salaam hosts more than six times the national average of 0.02 doctors per 1,000 persons, more than 50% of the regions in the country host less than 0.01 doctors per 1,000 persons (HRH Census 2001/02; Wyss 2004).

An alternative way of measuring geographical imbalance is by comparing the accessibility of particular services at different geographical locations. Olsen et al. (2005) have studied the availability of personnel that can provide emergency obstetric care in six districts in northern Tanzania. They find that although the average availability of personnel is adequate by national standards, there are large variations in staffing levels across districts. Most qualified staff is concentrated in a few centralised locations, while severe understaffing prevails at dispensary level in rural districts.

2.3. Weak productivity and performance

There is a general understanding that the productivity of the health workforce is low and that performance is poor. However, no comprehensive assessment of the level of productivity and performance is currently available. Kurowski et al. (2004) provide an estimate of productivity levels based on a time and motion study of 30 health workers from 10 facilities (including dispensaries, health centres and hospitals located in both rural and urban areas). Their findings suggest that there is a potential for significant productivity improvements. In their study, health workers use 57% of their time on productive activities (patient care, outreach, training, cleaning, preparation, maintenance and research). By eliminating the time spent on unproductive activities (i.e., breaks, waiting for patients, social contacts, and unexplained absences), health workers would have used 83% of their time on productive activities. The estimated potential productivity gain is thus 45% relative to the current situation.

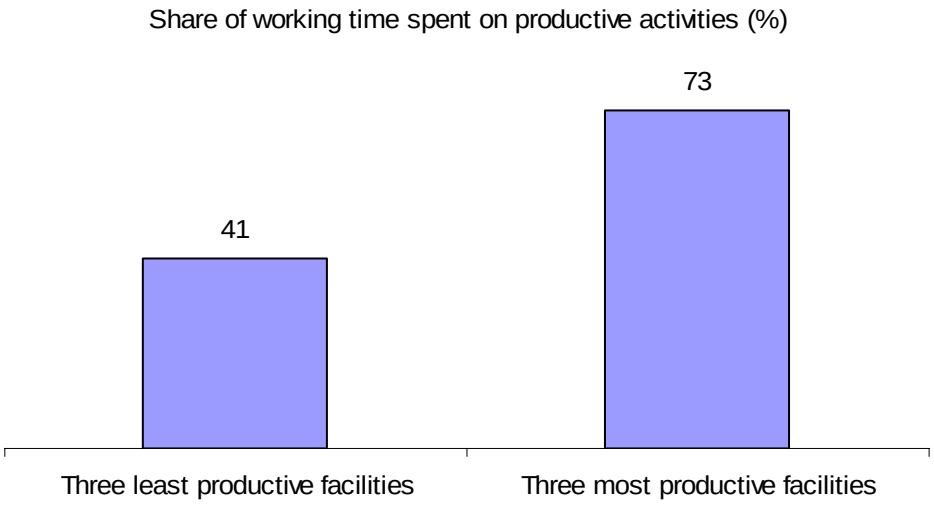
Figure 5. Significant amount of health worker's time spent on unproductive activities



Source: Kurowski et al. (2004).

One indication that it is in fact possible to realise substantial productivity gains is the observation of very large differences in productivity levels across facilities.

Figure 6. Large variation of across facilities in time spent on productive activities



Source: Kurowski et al. (2004).

The productivity definition applied by Kurowski et al. is a narrow one, because it does not capture the fact that time spent on productive activities may be used more or less effectively, as for instance reflected in the number of tasks accomplished per unit of time. McKinsey (2004) argues that the potential productivity gain may be as large as 60-75% when taking into account the potential for such effectiveness improvements. Although the empirical foundation for this estimate appears fragile, since it is only based on judgements by "health experts", it does not seem unreasonable to assume that such effectiveness improvements can be achieved.

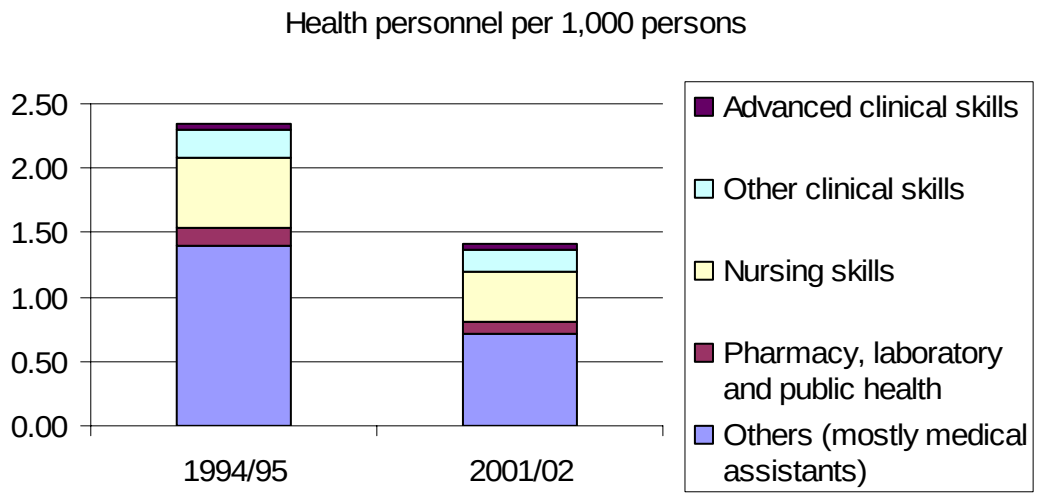
Very limited data exist on the performance, i.e., the *quality* of work, of health personnel. Health worker performance can in principle be assessed either by comparing actual behaviour with some reference guidelines, or by comparing actual behaviour with what health workers have demonstrated that they are capable of doing in a prior test. Leonard et al. (2005) used the latter approach in assessing the performance of a sample of 80 clinicians (medical doctors, clinical officers, clinical assistants and nurses of various specializations) in Arusha region. They found that some clinicians routinely misdiagnose and mistreat common illnesses, not because of lack of skills or medicines, but because they do not provide the effort necessary to find the correct diagnosis. Among women with pelvic inflammatory disease, 33% were misdiagnosed and 60% were mistreated. Patients with classical symptoms of tuberculosis were misdiagnosed 14% of the time and mistreated 67% of the time. Less than 20% of the clinicians informed the TB patients of the importance of taking medicine or going to a referral if medicine was not available.

By comparing what clinicians did in practice with the abilities they demonstrated in a test, Leonard et al. showed that

1) *The average skill level is poor*: In the skill test, clinicians did the right thing only 49% of the time
2) *Motivation/effort is weak*: Even clinicians who demonstrated in the test that they knew what to do, did not actually do the right thing in practice more than 53% of the time.

The problem with low skill level is magnified by the large share of the health workforce with little or no formal education. Despite a reduction in the number of low cadre workers over the last decade, medical assistants (i.e., medical attendants and nursing assistants) – who may have one year one-the-job training as their only formal qualification – still made up as much as 48% of the health workforce in 2002. Hence, there is still a long way to go to achieve the objective of the 1996-2001 strategic plan to reduce this share from 57% in 1994/95 to 25-30% in 2015 (MoH, 1996).

Figure 7. Unskilled health workers still constitute a high share of the workforce



Source: HRH Census 1994/95 and 2001/02; Wyss (2004).

The imbalance between skilled and unskilled health workers will be aggravated by the scaling up of care and treatment for people living with HIV/AIDS, as these services typically require skilled personnel.

The result of Leonard et al. that motivation among health workers is weak has been confirmed in other studies as well. Manzi et al. (2004) conducted in-depth interviews with a sample of 17 health workers at rural dispensaries. They judged 70% of the staff to have intermediate or low levels of work motivation. Moreover, a study from Muhimbili National Hospital indicates that the overall staff motivation level is low. About 50% of doctors and nurses were not satisfied with their working conditions (Mwahonda 2004; Dominick and Kurowski 2005).

3. The HRH Policy Process

In 1995, Tanzania developed a HRH policy, which formed the basis for its HRH strategic plan for the period 1996-2001. The plan focussed strongly on improving the quality of the workforce, and key strategies were to strengthen continued education and reduce the number of unskilled staff. Fewer unskilled staff was seen as a way both to improve quality and to create financial space for increased salaries of the skilled workforce. Despite a modest annual budget of around 3.5 billion Tsh, large parts of the plan were never financed and implemented. This may partly be explained by the fact that donors usually have thought of human resource issues to be beyond their scope, but it probably also reflects the relatively low priority that has been put on HRH by the Tanzanian government.

During the last few years, a consensus has been formed that Tanzania is now facing a HRH crisis. At the Joint Annual Health Sector Review in 2004, the Permanent Secretary of Ministry of Health declared that in *"… the area of human resources, I believe, we have now reached a crisis point"*. At the Annual Review in 2005, Ministry of Health asserted that the crisis now has reached emergency proportions. The crisis is also recognised at the highest political level. President Mkapa, in his address to the Annual Meeting of Regional Medial Officers in August 2005, emphasised that the shortage of health personnel *"..is a serious problem, which requires urgent steps"*.

A number of factors have contributed to this common understanding. First, while the HRH issue has been a great concern in the Ministry of Health for quite some time, the grievance of the problem has recently become more apparent, as data on the results of the hiring freeze during the 90s have shown up in a large reduction in the stock of health personnel per capita and as the burden of HIV/AIDS on the health workforce has been recognised.

Second, the great international focus on the HRH issue in recent years has impacted on the Tanzanian policy debate. In particular, the international pressure on the implementation of extensive HIV/AIDS care and treatment programmes has raised the issue of a HRH shortage to new dimensions. The recognition of the huge numbers of skilled staff needed to provide ARV treatment to people living with HIV/AIDS, combined with the understanding that Tanzania at present lacks the personnel needed to provide even the most basic health services, has created great concern that basic services will suffer under the implementation of large new vertical programmes. In Tanzania, the WHO seems to have played an active role in bringing the concerns expressed in the international HRH policy debate higher on the national agenda.

Third, increasing pressure on the donor community in recent years to demonstrate results from development assistance has created larger willingness among the development partners to go into areas which traditionally have been considered beyond their scope, but which nevertheless are critical for the achievement of results.

Fourth, the publication of new research findings seems to have been important. More reliable data on the HRH situation in Tanzania, made available through the 2001/02 Census, gave credibility to the claims about a massive shortage of health personnel. Moreover, studies demonstrating low productivity of health workers have impacted policy makers, as this was one of the main points put forward by President Mkapa's in his above mentioned speech.

Finally, health workers themselves have lately raised their voices more loudly. A recent strike among doctors at Muhimbili National Hospital, where doctors demanded a 100% increase in

their salaries, contributed to bringing the issue of working conditions in the health sector to the forefront.

Despite the general understanding in the Ministry of Health that Tanzania has been facing a health worker crisis for some time, there were not until recently any signs of a crisis management mode. The most visible expression of the need to address the crisis was perhaps the appointment of a HRH Working Group in May 2004. The group, which has members from several ministries (Health, Finance, Regional and Local Government (PO-RALG), Public Service Management (PO-PSM)), WHO, World Bank, bilateral donors and research institutions, serves an advisory role to the Ministry of Health on issues related to the health worker crisis.

However, momentum to the process seems to have increased during 2005. The recruitment restriction on the clinical officer cadre was lifted as of January 2005. The government has also reinstated central recruitment of clinical officers, contrary to the intention of the decentralisation reform, in order to speed up the recruitment of vacant positions. The Ministry of Health is arguing that central recruitment should also be reinstated for nursing cadres. Moreover, a cabinet paper has been submitted on an increase in the rate of recruitment, and a new incentive package for public service is proposed to be included in next year's budget. Although the details of the proposal are yet unknown, President Mkapa has publicly supported new incentives for workers willing to take on positions in backwater districts and for workers in hazardous professions, like health workers and police on patrol. This is an important political signal in a country which traditionally has shunned wage differentiation on ideological grounds.

The Human Resource Department in the Ministry of Health is responsible for the development of HRH policies and strategies. The Department is currently working on a new HRH policy document, which will form the basis of a new strategic plan on HRH in Tanzania. Lately, this process has taken place with a high momentum. At the same time, the HRH Working Group has initiated a process to ensure that existing evidence on HRH in Tanzania is taken into account in the development of the HRH policy and strategies.

Notwithstanding recent attempts to implement policies that may give some quick wins on the HRH issue, the fundamental reasons for the HRH crisis have yet to be addressed. A number of challenges must be dealt with in order to move the process forward.

First, financial constraints need to be overcome. It is unlikely that the HRH crisis can be solved without a significant increase in salaries. That will require additional resources, and even more so since an increase in health worker salaries may have implications for salary levels in other sectors as well.

Second, since worker shortages are also experienced in sectors other than health, there is clearly a need to convince policy makers about the extent of the problem and the importance of addressing it. In his speech to the Regional Medical Officers in August, President Mkapa emphasised that shortage of personnel is also an urgent problem for instance in the education sector and the judiciary, and he therefore asked for patience on the implementation of suitable policy measures.

Third, the HRH issue needs to be lifted higher in central national policy documents. In Tanzania's National Strategy for Growth and Reduction of Poverty (NSGRP), there is currently no appreciation of the fact that the severe shortage of health personnel has the potential of undermining all other efforts to strengthen health service delivery.

Fourth, despite substantial research efforts during the last few years, a number of knowledge gaps remain to be filled, in particular on the potential effect of alternative policy measures that may be used to address the health worker crisis. Improved knowledge both about the costs and the effectiveness of policy alternatives will be helpful both in giving direction to HRH policies and in getting broad political support for the proposed measures.

Finally, the priority that will be attached to the HRH issue in Tanzania will depend in large part on the ability of the Ministry of Health, and in particular on its Human Resource Department, to raise the awareness and convince other sector ministries of the need to address this challenge. However, a serious problem is that the Human Resource Department is short on resources, both in terms of personnel and in terms of reliable and updated information on the health workforce. A strengthening of the Department thus seems to be needed. Meanwhile, the HRH Working Group may also play a key role in facilitating the work of the Human Resource Department as well as in raising awareness across ministries.

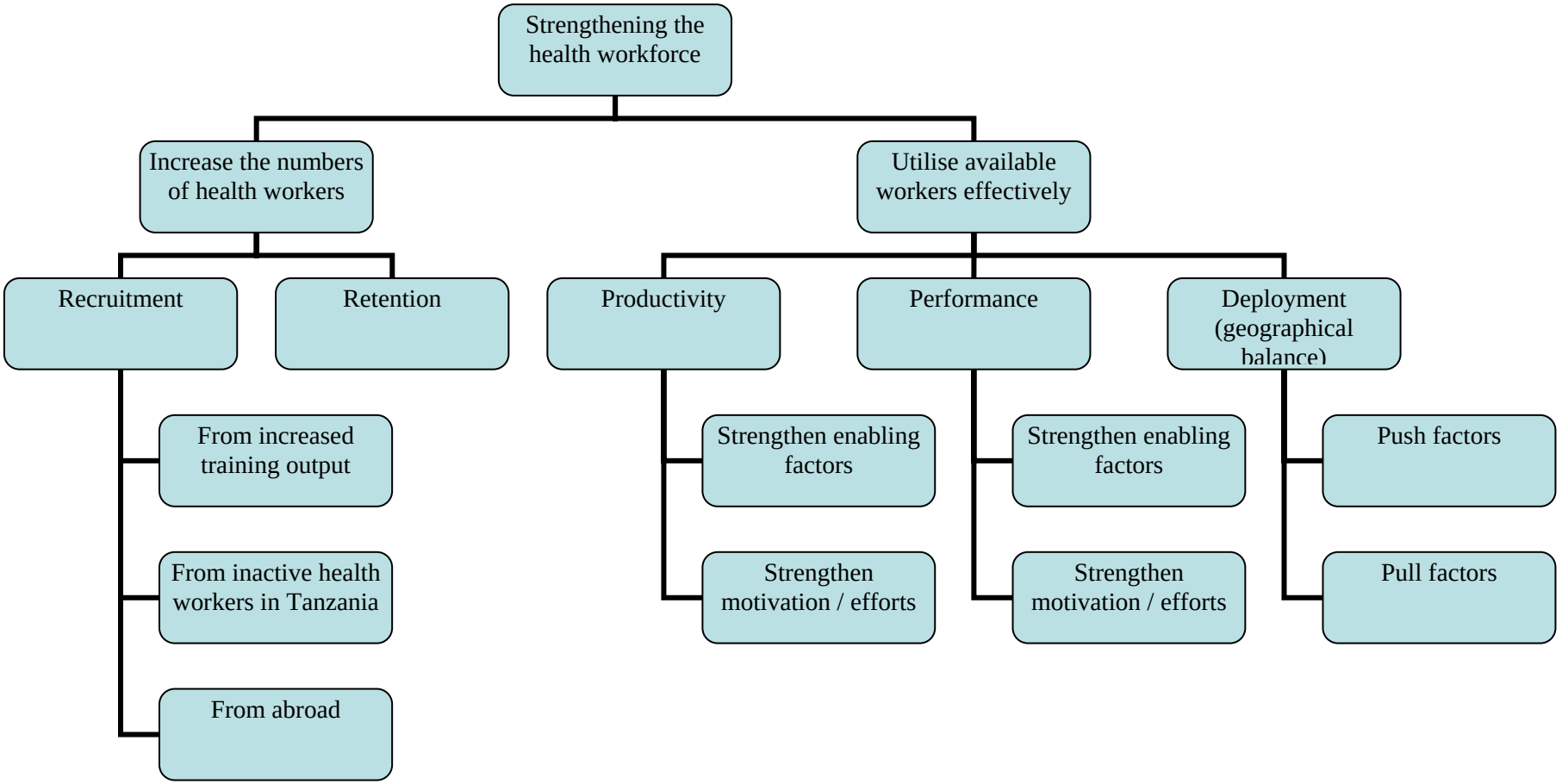
4. The Choice of a HRH Strategy

There is a general understanding amongst decision makers in the Tanzanian health sector that time has now come to go from talk to action on the issue of HRH. The question is no longer whether or not there is a HRH crisis. The crisis is there, and the question is what should be done to address it.

The set of alternative strategies and policies that may strengthen the health workforce is huge, at least at first glance. As illustrated in Figure 8, available strategies include measures that seek to increase the size of the health workforce (through higher training output, through increased recruitment of both new graduates and inactive health workers, and through higher retention of existing staff), measures that will improve productivity and performance (through better organisation and management, upgrading of skill levels, and provision of working conditions that enable and motivate staff to utilise their capacities in a productive way), as well as measures to reduce geographical imbalances. While none of these areas can be neglected, resource constraints will force strategic choices to be made as to where to concentrate efforts. Moreover, each of the strategic objectives may often be attained through a whole set of alternative policies. For instance, it is far from obvious how staff motivation/efforts can be improved most efficiently (suggested alternatives include salary increase, access to continued education, more transparent HRH management practices, better equipment, etc.).

This section sheds light on the potential of alternative strategies to strengthen the health workforce in Tanzania by presenting available evidence on HRH issues within the conceptual framework of Figure 8. A brief discussion of financial implications is included towards the end of the section.

Figure 8. Choosing a strategy for strengthening the health workforce. A conceptual framework.



4.1. Increase the aggregate number of health workers

In principle, there are two ways of increasing the aggregate number of health personnel; by increasing recruitment and by reducing attrition. Recruitment can be increased either by drawing from the domestic pool of inactive health workers, by educating more health workers and hiring a larger share of the training output, or through immigration of health workers.

4.1.1. Increase recruitment

Recruitment from domestic inactive health workers. The domestic pool of inactive health workers in Tanzania is not known. McKinsey (2004) estimated the size of this pool in 2002 by utilising data on the cumulative training output of health workers in the period 1994/95 - 2002 and comparing with the actual increase in the number of health workers in the period. Assumptions were made to adjust for emigration and attrition from the workforce.[5] They concluded that the pool of trained but unemployed health workers in Tanzania is quite small.

In their calculations, McKinsey used *predictions* of the actual HRH stock in 2002 (from Kurowski et al. (2004)) rather than the complete HRH Census data. Since the latter has a significantly lower estimate of the HRH stock, McKinsey may have underestimated the domestic pool of inactive health workers. Therefore, we have adjusted McKinsey's estimate of the number of inactive health workers upwards based on the complete Census data (see Figure 9).[6]

Figure 9. There may be a substantial pool of inactive health workers within Tanzania

Source: Reanalysis of McKinsey (2004) data based on HRH Census data 2001/02.

[5] 10% upfront emigration of graduates was assumed for Medical Doctors, with lower rates for other cadres. The annual attrition rate was set to 4%.

[6] There is some indication, however, that the HRH Census 2001/02 is underestimating the number of workers in the private sector. For instance, several private health facilities in Dar es Salaam are not included in the survey (Kurowski, personal communication). If this is the case, our adjusted estimate of the pool of inactive workers should be reduced somewhat.

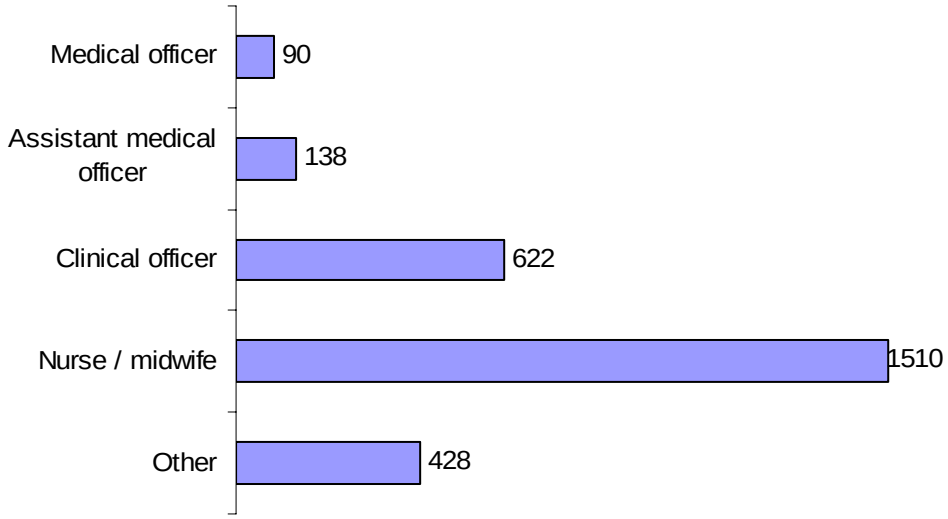
When using the 2001/02 Census data as the baseline, we find that there may exist a pool of 8,700 trained but inactive health workers within Tanzania in key medical and nursing cadres. This amounts to 54% of the current workforce belonging to these cadres. The pool of inactive workers is dominated by clinical officers and nurses. In addition to these figures would come any inactive health workers trained before 1994/95. However, it should be underscored that these estimates are based on highly uncertain assumptions.

No systematic evidence has been collected on the current occupations of the inactive workforce. Therefore, little is known about what it would take to attract these workers back into the health sector.

Recruitment from increased training output. Some 2,800 students graduate annually from Tanzania's health worker training institutions (MoH 2005c[7]). About 30% of the graduates have acquired clinical skills and 50% have nursing skills.

To increase training output brings no short-term solution to the health worker crisis, due to the considerable lead time from the expansion of training capacity until the graduates can be recruited into the health workforce. Simple back-of-the-envelope calculations suggest that in order to increase the number of health workers by 10,000 over a ten year period, training capacity would have to increase by 50-70% relative to the average training output in 2000-2004, assuming an average lead time of 3-5 years.

Figure 10. Average annual training output of health personnel 2000-2004



Source: Medical doctors; Wyss (2004)[8]. All other cadres; Ministry of Health (2005c).

At present, a considerable share of the training capacity is used in order to upgrade skills of the existing health workforce. According to Dominick and Kurowski (2005), more than half of the graduates in 2000 were recruited from within the health sector. If new training capacity is utilised in the same way, a significantly larger expansion of training capacity will of course be needed in order to attain the same expansion of the health workforce. On the other hand, if

[7] Average numbers in the period 2000-2004.
[8] A recent increase in the training capacity of medical doctors is expected to increase training output to at least 150 in a few years time.

what is most needed are graduates at higher levels (e.g., Assistant Medical Officers) it can be wise to recruit from within the health workforce; the benefit in terms of reduced lead time must in this case be weighed against the costs of a temporary reduction in the health workforce as upgrading of skills is taking place.

No assessment has so far been made of the possibilities of expanding training capacity. Ministry of Health (2005c) reports a chronic shortage of teachers of more than 50% in the 109 government and private health training institutions. Out of the required staffing levels of 956 teachers, only 451 teachers are actually in place. Recruitment of teachers from abroad may be the only short and medium term solution to this undersupply; to wait for new teachers to qualify in sufficient numbers would simply take too long.

Recruitment from Tanzanians living abroad. Emigration of health personnel presents a huge challenge to many sub-Saharan countries. It is however generally assumed that the emigration problem is smaller in Tanzania than elsewhere, in particular in the nursing cadres. Based on three focus group discussions with doctors in Tanzania, McKinsey (2004) concluded that the rate of migration of Tanzanian doctors is around 10%. Needless to say, this estimate is highly uncertain. Emigration rates of other cadres have not been estimated. Hence, the number of Tanzanian health workers employed in other countries is yet largely unknown. Nor is it known where these health workers have emigrated, although it is assumed that a large share is working in other sub-Saharan countries.

Low salaries and poor working conditions have been shown to be the main reasons given for the desire to emigrate from other African countries (Awases et al. 2004). It is reasonable to believe that the same factors account for a large share of out-migration in Tanzania. But no one has yet studied how much it would take to attract people back. Would salaries in Tanzania have to be raised to comparable levels as in, e.g., Botswana and South Africa, or would the close ties of the Tanzanian people to their home country imply that smaller increases would suffice?

To attract non-Tanzanian health workers from abroad is not a viable option, given the strong demand for health workers from countries with far better working environments than in Tanzania, and given that Tanzania's neighbouring countries are also struggling with huge shortages of health personnel.

4.1.2. Reduce attrition

Attrition rates of the health workforce in Tanzania are unknown. Previous studies have assumed an attrition rate of around 4%, but preliminary results from a pending study on public sector attrition suggest that the actual attrition rates may be considerably higher.[9]

Predictions of future health worker requirements are sensitive to the attrition rate. For instance, a reduction in attrition rates from 6% to 4% would accumulate to more than 6,000 additional health workers over a 10 year period. This is comparable to an increase in the training capacity of 30-40%.[10]

Attrition is partly involuntary, caused by death, disability, and retirement. For policy purposes, the interesting part of attrition is the one related to changes in occupation, withdrawal from the labour force, and emigration. Although no studies are yet available on the reasons for voluntary attrition, it is reasonable to assume that a large share of such attrition is caused by better opportunities elsewhere compared to the health sector. But how

[9] C. Kurowski, personal communication.
[10] An average lead time of 3-5 years has been assumed.

much of this can be explained by low salaries in the health sector and how much is due to other factors in the working environment? Without a proper analysis of such questions, it is hard to advice policy makers on what are the most effective and efficient interventions for reducing attrition rates.

4.2. Utilise available health workers effectively

Besides increasing the stock of health workers, the second major route towards strengthening of the health workforce is to utilise the existing workforce more effectively. This can be achieved through increased productivity, improved performance and through more effective (and equitable) deployment of personnel.

It should be emphasised, though, that to utilise the existing workforce more effectively is not necessarily as detached from the issue of the size of the workforce as it may seem from Figure 8. For instance, a too heavy workload, caused by shortage of personnel, may be one major reason why health workers lose their motivation, which in turn may lead to low productivity and performance.

At present, there are larger uncertainties attached to strategies aiming at more effective utilisation of the existing workforce compared to strategies that seek to expand the workforce. First, the knowledge about the *potential* of strengthening the health workforce through better utilisation of existing personnel is more *uncertain* than the knowledge about the potential of the various stock-increasing strategies discussed above. Moreover, the knowledge about which *policy measures that will realise the assumed potential* of the existing workforce is also considerably *weaker* than the knowledge about how the stock of the health workforce can be increased. Despite larger uncertainty, though, the potential improvements in the utilisation of the existing workforce seem so large that such strategies should receive considerable attention.

4.2.1. Increase productivity and improve performance

Productivity and performance can be measured along a number of dimensions, and their determinants are numerous and interlinked in complex ways. In order to structure the discussion, we will utilise the conceptual framework illustrated in Figure 11. We define productivity and performance as follows:

Productivity is output per working hour. Productivity can be increased by

- Increasing the share of working hours spent on productive activities
    - Reducing absenteeism
    - Reducing share of time at work spent on unproductive activities
- Increasing output during productive hours

Performance captures the qualitative aspects of work, both technical quality (e.g., accurate diagnosis and correct treatment) and interpersonal quality (e.g., patient courtesy). Performance can thus be improved through

- Improved technical quality
- Improved interpersonal quality

The **determinants of productivity and performance** can be classified as either *enabling factors* (the environment) or *worker efforts* (human behaviour). While the enabling factors (e.g., skill level and physical infrastructure) to a large extent can be controlled by policy makers, worker efforts can often not even be observed. Attempts to increase worker efforts must therefore rely on indirect approaches, such as

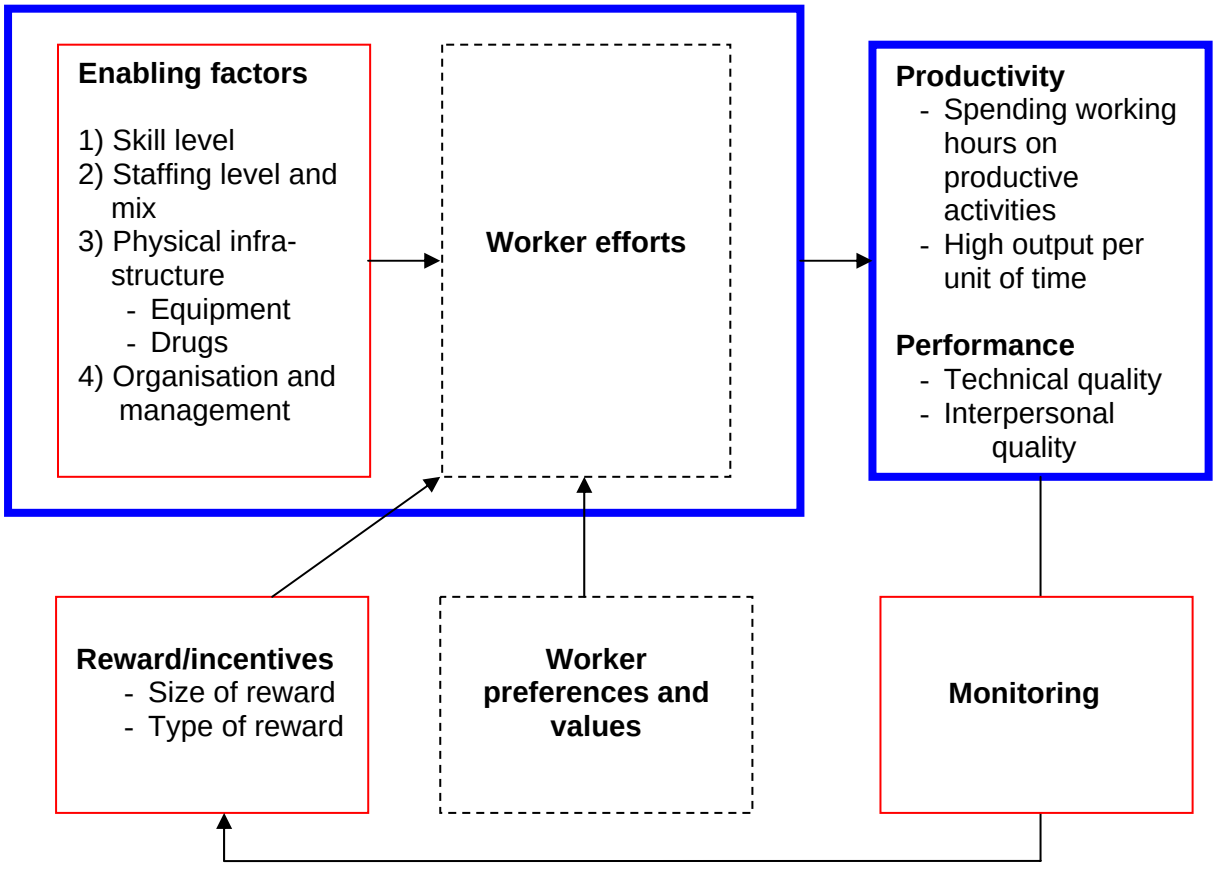
1) Increasing the reward/incentive for high output/quality.
2) Improving the enabling factors, thus increasing output/quality at any level of efforts.
3) Changing the type of reward to be more in accordance with what health workers appreciate/value.

Note that enabling factors play a direct role for productivity and performance as well as a potential indirect role by motivating workers to exert higher efforts.

It is important to realise that the type of reward that will motivate workers is tightly linked with their preferences and values. While some workers are strongly motivated by monetary rewards, others may be more motivated by social rewards or sanctions, either from their colleagues, from their managers, or from the communities that they serve. And some people feel strongly rewarded simply by seeing their work make a difference to the people they serve.

Some kind of monitoring of productivity/performance is obviously needed in order for reward mechanisms to have an effect. For health workers that are strongly motivated by doing a meaningful job, it suffices that the individual worker knows his/her productivity/quality. In cases where extrinsic incentive mechanisms apply, there must be some kind of external supervision. In some cases, increasing the level of supervision may in itself be sufficient to induce higher worker effort, simply because workers want their supervisor to think that they are doing a good job.

Figure 11. Conceptual framework for determinants of productivity and performance



In order to recommend strategies and policies for improved productivity and performance, one needs a clear understanding of

a) Which aspects of productivity and performance that should be addressed (what is the problem?)
b) Which kind of enabling factors and/or rewards that are best suited to the purpose (what is the most efficient policy measure?)

For instance, it will typically take another set of policy instruments to increase clinical quality than to reduce absenteeism. Moreover, it is important to be aware that improvements along one dimension (e.g., output per unit of time) may be in conflict with other dimensions (e.g., clinical quality). How can existing evidence guide us in answering these questions?

Evidence on productivity and performance
Absenteeism: No comprehensive evidence has yet been established on the degree of absenteeism, but it may be worth noting that a study from Uganda found absenteeism rates of 37% in health facilities (Chaudhury et al. 2004). Anecdotal evidence from Tanzania suggests that extensive moonlighting takes place, both among doctors (who moonlight in private health facilities) and nurses (who moonlight in agriculture) (e.g., McKinsey 2004).[11]

Spending working hours on productive activities: Kurowski et al. (2004) find that a large share of working hours is spent on unproductive activities. In their sample, if wasted hours were fully utilised, the productivity of the health workers would increase by 45%. If these figures were representative for the Tanzanian health sector (which they most likely are not), there would be a potential of adding the equivalent of 20,000 additional health workers simply by using a greater share of working hours on productive activities.

Output per productive hour: No evidence is available.

Technical quality: Poor technical (clinical) quality is documented by Leonard et al. (2005). Moreover, quality differences among health facilities have been shown to be large enough to induce patients to bypass their nearest health facilities and travel over longer distances in order to receive quality service (Leonard et al. 2002).

Interpersonal quality: President Mkapa, in his address to the Regional Medical Officers in 2005, mentioned examples of health personnel using dirty and abusive language towards patients and health workers that are seeking bribes from their patients. We interpret this as a strong signal that interpersonal quality issues are a problem at least in some parts of the health sector, although systematic evidence on interpersonal quality seems to be lacking.

Evidence on how productivity and performance may be improved
There is a wealth of suggestions on how productivity and performance may be improved, both in the form of rewards (increased salaries, better career and promotion opportunities, possibilities to receive continued education, (team) incentives for high performance etc.) and in the form of improvements in enabling factors (upgrading of continued education system (e.g., the Zonal Training Centres), improved information and performance management systems, upgrading of management and organisation skills both at facility, district and central levels, reduced workload through increased number of staff, provision of adequate equipment and other supplies etc.).

[11] For the health sector as a whole, moonlighting in other occupations is of course a more serious problem than moonlighting in other health facilities.

Evidence on the degree to which any of these measures are able to improve productivity and performance is extremely scarce, despite a few scattered examples:

Skill level: Leonard et al. (2005) find that clinical performance is strongly related to skill levels. Knowing what to do (i.e., high skills) doubles the probability that clinicians actually do the right thing in practice (from 27% to 53% in this study).

Staffing level and skill mix: Kurowski et al. (2004) find no correlation between time spent on productive activities and the staffing level relative to the population in the catchment area, but the evidence is not strong enough to preclude the possibility of such a relationship.

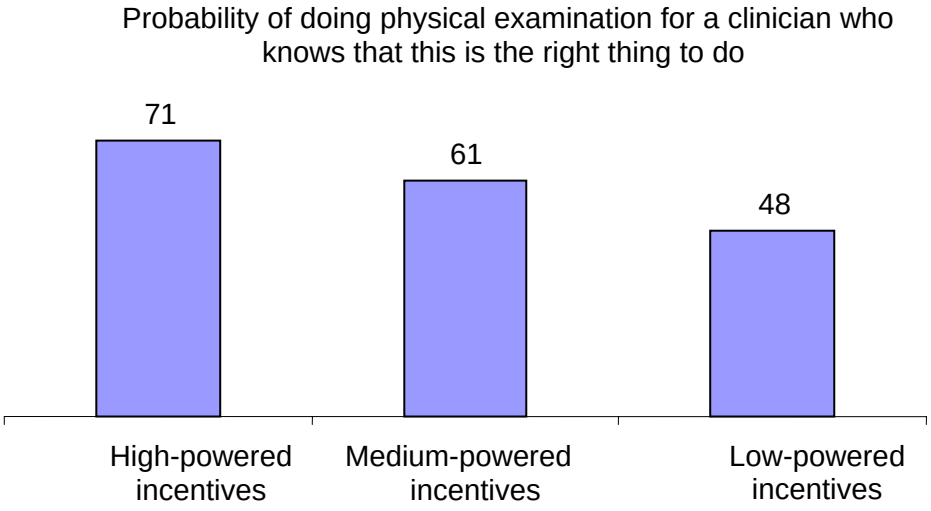
Physical infrastructure: While it is obvious that physical infrastructure is important for technical quality, there is also some evidence to support that physical infrastructure affects productivity. Kurowski et al. (2004) find that availability of drugs increases the demand for health services and that productivity is higher when demand is high.

Organisation and management: The observation that productivity increases with demand (Kurowski et al. 2004), suggests that organisation of the health sector in accordance with demand patterns has a potential impact on productivity. No evidence is available on the effect of health personnel management on productivity and performance.

Rewards and incentives: Leonard et al. (2005) find that incentives may strongly improve clinical performance. Strengthening the incentives of clinicians working in organisation with "low-powered" incentives[12] increases the probability of correct diagnosis and treatment by up to 20%.

[12] Incentives are categorised as low-powered if supervisors have little opportunities to hire and fire, little discretion over salaries and the type and number of clinicians who work for them, and little financial independence.

Figure 12. Incentives may strongly affect clinical performance



Source: Leonard et al. (2005).

The policy implication is that upgrading of skill levels is not the only measure available to improve clinical performance; reward and incentive mechanisms may also be powerful mechanisms towards this end. In the Tanzanian context, this result could be taken to imply that the planned strengthening of continued education through upgrading of the Zonal Training Centres can be fruitfully combined with incentive packages that induce clinicians to put their knowledge into practice.

Monitoring: No evidence is available.

4.2.2. Improve deployment and geographical balance

There are constantly quite a number of funded but vacant posts in the Tanzanian health sector. It is a clearly stated goal of the Ministry of Health to reduce the vacancy rate. Data on the number of vacancies have not been published, but the Ministry of Health has identified a total of 2616 posts for recruitment in the district health system for the financial year 2004/05. The total number of vacancies must lie well below this figure. Compared to some of the strategies identified above, improving the deployment procedures is thus a strategy with a fairly limited potential in terms of solving the health worker crisis.

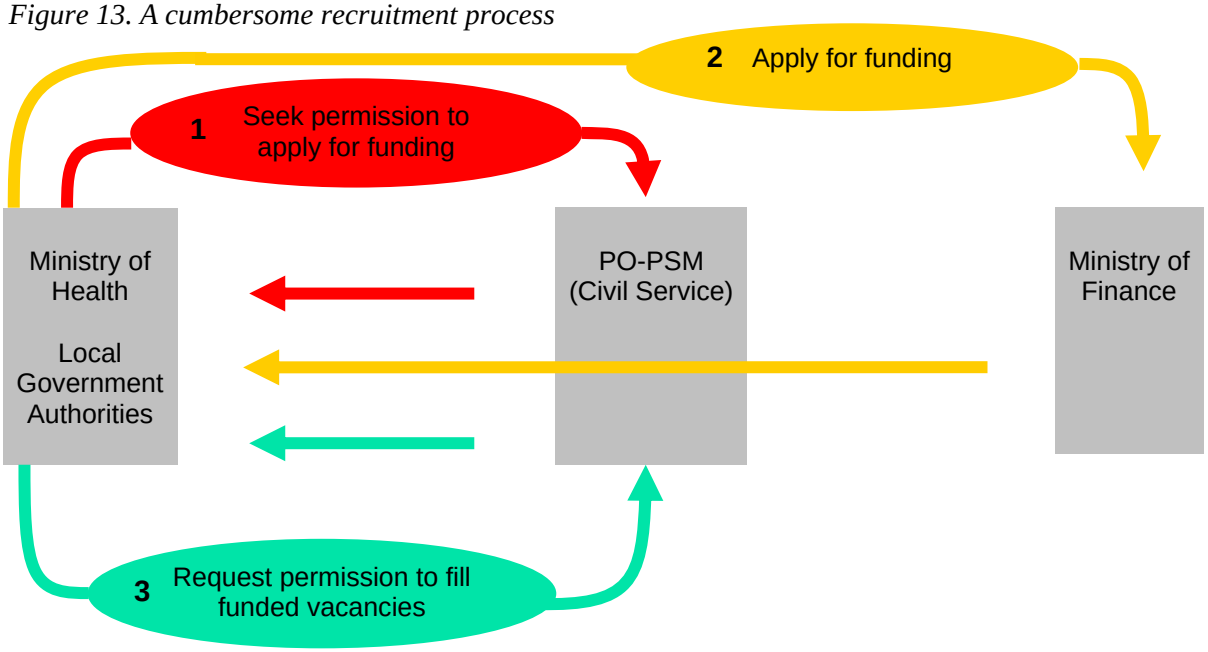
Possible policy alternatives to improve the deployment process include:

1) Better information about recruitment procedures to Local Government Authorities (who are responsible for recruitment in the district health system).
2) Simplification of the recruitment process
3) Empowering employers with new instruments to attract workers into the health sector in general and into rural districts in particular.

The Ministry of Health has been writing letters to district Councils reminding them to fill up vacant posts. They have also reinstated central recruitment of clinical officers in an attempt to speed up the recruitment process. The recruitment process is a cumbersome procedure involving a number of ministries in several steps (Figure 13). When a permit to fill a funded post is finally issued to the employer (i.e., the Ministry of Health or the Local Government

Authority), the permit is valid for three months only. Experience shows that districts may not be able to fill the posts within this time frame. The delay may in part be a result of the fact that districts so far have little experience with the decentralisation reform, but it may also be a reflection of fundamental difficulties in getting potential workers to go to the districts and show up for an interview, after which the candidate may eventually be turned down. The costs of travelling may be too large to bear this risk. Hence, it is unclear how much the vacancy rate can be reduced simply through administrative measures.

Figure 13. A cumbersome recruitment process



Source: Ministry of Finance.

This brings us to the issue of how to reduce the geographical imbalances of the health workforce. To expand the aggregate health workforce does not necessarily ensure that health workers are employed in geographical areas where they are most needed. Quite contrary, there is a concern that additional supply will mainly benefit urban areas, where coverage is already better than in rural areas (Wyss, 2004).

In principle, there are three ways of addressing the problem of geographical imbalance:

a) *Pull:* Provide incentive packages (e.g., hardship allowances, housing)
b) *Push:* Implement coercive measures (e.g., bonding)
c) Influence health workers' preferences for rural vs. urban life

In Tanzania, neither push nor pull measures have been implemented thus far. However, the Tanzanian policy of dispersing training institutions over a wide geographic area may be seen as an attempt to affect preferences of the candidates, by letting them get used to a rural life, or maybe more precisely, by not letting them develop the taste for a typical urban life. There are no studies available on the effectiveness of these measures.

As discussed above, there are now signals coming up that incentive packages will be proposed in order to attract health workers to backwater districts. There is no evidence, however, on how strong incentives that are needed in order to make an effect.

Bonding is also being discussed as a potential policy measure. At present, there are several districts in Tanzania without a single Medical Officer. It is not difficult to see that the geographical distribution of doctors could be significantly improved by, for instance, a two year compulsory bonding arrangement upon completion of the internship period. Two classes of graduates would imply 200+ doctors to be shared among 100+ districts and would imply a significant improvement in coverage in most places. Some kind of supervision and incentive package at the completion of the bonding period may however be needed in order to ensure compliance.

The combination of bonding and incentive packages is about to be implemented through the Mkapa Fellowship programme. The Fellowship programme is an example of voluntary bonding, where health workers choose to bond in order to receive some future reward. This programme offers an opportunity to learn more about which kind of incentives are needed in order to improve health worker coverage in rural districts.

4.3. The optimal skill mix

As discussed above, a balanced skill mix at each facility is a potentially important factor for improving facility performance. But the skill mix issue is not merely a question of grouping together workers with complementary skills. It also involves the more fundamental question of which types of skills the workforce as a whole should possess, a question that should be answered based on what kind of tasks the health workforce should be optimised to deal with. This is a strategic choice that should impact both on curriculum developments at training institutions and on decisions about which cadre that should be prioritised for recruitment.

Appropriate policy instruments for strengthening the health workforce may differ across cadres. Therefore the answer to the question of which cadres that should have priority will influence the whole discussion of which policy measures that should be taken in order to strengthen the health workforce.

In deciding which cadre that should have priority, attention should be paid to where current shortages are most critical for the quality of health service delivery, as well as to the relative costs of increasing the supply of alternative cadres.

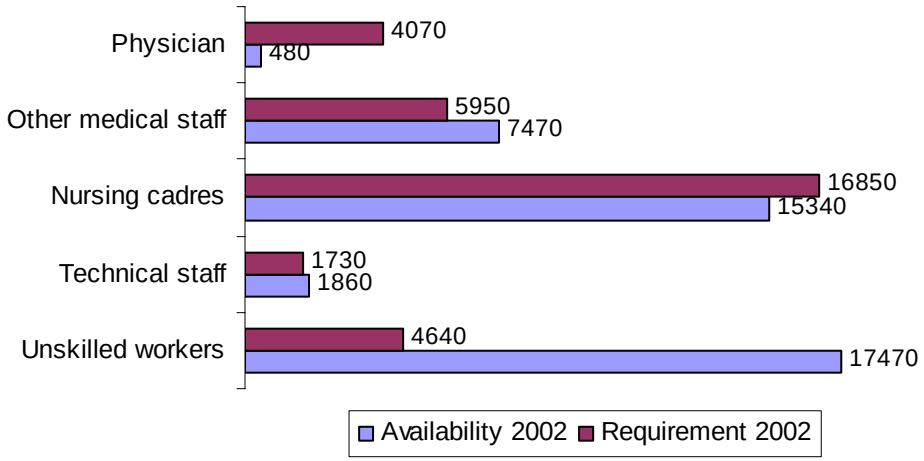
One way of addressing the relative shortage of various cadres is by comparing actual staffing levels to the staffing norms. As shown in Figure 2, such an analysis suggests that the greatest shortages currently are found among Assistant Medical Officers / clinical officers and lab technicians (60%), followed by nursing cadres (50%) and doctors (40%).

An alternative way of addressing the relative shortage across cadres is by focusing on which cadre that is most crucial for the expansion of priority interventions. While many childhood diseases can be dealt with by personnel with relatively low skills, HIV/AIDS care and treatment typically require higher skill levels. Therefore, the analysis of which cadres that are more critical than others will depend on the prioritisation across interventions.

In their study of human resource requirements for a set of priority interventions needed to reach the health related MDGs, Kurowski et al. (2004) concluded that the greatest shortage was found among doctors (~90%) (Figure 14). Note however that in addition to the

requirements for these priority interventions come the worker requirements for non-priority interventions. Gaps are therefore greater than these figures suggest.[13]

Figure 14. Requirements for priority interventions are largest among doctors



Source: Kurowski et al. (2004)

Analysis of *future* requirements will imply an even higher relative shortage of skilled workers, as the implementation of the Tanzanian HIV/AIDS care and treatment plan will require a disproportionally high share of skilled workers.

Hence, available evidence suggests that the most critical shortages are found among the skilled personnel and that unskilled personnel actually may be in oversupply. The evidence is however less conclusive as to which type of skill that is most needed. This will depend to a large degree on which interventions that will be given priority. However, there is always a sense in which higher level cadres are more crucial than lower level cadres, because highly skilled persons may substitute for lower skill levels, but not vice versa. While a hospital nurse is capable of doing a number of different tasks, there is not that much she can do if not supervised by a doctor. Therefore, one should in principle be especially concerned with shortages at higher levels.

The benefits provided to the health system by increasing the supply of various cadres should be weighed against the costs. The cost differentials across cadres are mainly related to the length of study and the differences in salary levels, but they are also influenced by emigration rates.

It is more costly to increase the supply of higher skills, not only because more resources are put into training, but also because the health sector will have to wait longer for the labour of the educated workers. In a situation with severe shortage of personnel, one might therefore be willing to compromise on quality (by accepting health workers with less education) in order to address the acute crisis. In Tanzania, such a policy was followed in the education sector, where the shortage of teachers was addressed by starting to recruit teachers with less training.

[13] Priority interventions in Kurowski et al. include interventions related to TB, malaria, childhood diseases, HIV/AIDS and maternal conditions, plus support functions related to these interventions.

The situation in the health sector is probably different though. It is less obvious in the health sector than in the education sector that poor service is better than no service. Moreover, the health sector is to a larger extent dependent on the cooperation between cadres at various skill levels. If there are no doctors, there is not much a medical assistant can do.

Internationally, there has been some discussion as to whether the health worker crisis can be dealt with through increased supply of low skilled workers. The evidence and experience from Tanzania seem to contradict this view; what is needed in Tanzania seems to be an expansion of the skilled workforce.

Emigration rates are also potentially important for the choice between alternative cadres, in particular the choice between cadres that have almost the same real qualifications, but where only one of them has an internationally recognised degree. In Tanzania, Assistant Medical Officers have almost the same real qualifications as a Medical Officer, but their degree is not internationally recognised. Therefore, if newly educated Medical Officers tend to emigrate, there is an argument for putting relatively higher weight on the training of Assistant Medical Officers. Unfortunately, there is no available estimate of the emigration rates of newly educated Medical Officers, although some say that the rates are increasing. In sum, there thus seems to be some suggestive evidence to support that Tanzania should focus on the recruitment of highly skilled health workers, at the same time as there are good reasons to develop curricula that are not fully accepted internationally.

4.4. Financial implications

A systematic evaluation of the costs of alternative policy interventions has yet to be done. This section presents a few rough estimates based on scattered evidence.

A snapshot of the budget for the public health sector in Tanzania is presented as a background (Table 1). There has been a strong increase in health sector budgets in recent years, around 30% annually on average. Off-budget financing has increased even more. Given the high priority of health in national policy documents and among donors it is not unreasonable to assume that the health budget will continue to increase significantly.

Table 1. Large annual increase in health sector financing. (Bill. Tsh.)

	Actual 2002/03	Actual 2003/04	Actual 2004/05	Budget 2005/06
Recurrent	143.1	173.3	197	233.6
Development	33.2	46.8	118.6	144.9
Total on-budget	**176.4**	**220.1**	**315.6**	**378.5**
Increase in on-budget from previous year	**-**	*25 %*	*43 %*	*20 %*
Off-budget	60.8	90.3	140.3*	-
Total	**237.2**	**310.6**	**456.3**	**-**
Increase in total from previous year	-	*31 %*	*47 %*	-

Sources: Annual Health Sector Review (2005). Quarterly Budget Execution Report 4 Financial Year 2004/05. Guidelines for Medium Term Expenditure Framework 2005/06-2007/08.
*From budget, Annual Health Sector Review.

Personal emoluments amounted to 58 billion Tsh in 2004/05. The share of personal emoluments in recurrent expenditures has declined from 64% in the mid 1990s (MoH 1996) to 29% in 2004/05, due to a strong increase in other expenditures.

Costs of salary increase:
McKinsey (2004) argues that at least a doubling of the salaries is needed in order to fundamentally change the appeal of the health sector, and a tripling for higher skill levels like Medical Officers.

A doubling of salaries would amount to 58 billion Tsh, plus the extra costs related to increased recruitment into the sector. However, costs can be substantially reduced by discriminating in favour of cadres that are most needed (skilled workers). This will also stretch the wage scale, which currently is highly compressed, thus strengthening the incentives for continued education. For illustrative purposes, one way of implementing such a discriminatory wage policy is illustrated in Table 2. In the example, salaries have been increased by more than 100% for the high skilled cadres, while a smaller but still significant salary increase is given to other cadres.[14]

Table 2. An example of differentiated salary increases (Bill. Tsh.). (Illustrative)

	Monthly salary increase (1,000 Tsh)	Workers in public sector	Annual cost (Billion Tsh)
Doctors and specialists	300	548	1.97
Assistant Medical Officers	200	519	1.25
Clinical officers	150	2607	4.69
Professional nurses (a and b)	100	6723	8.07
Other cadres	25	24725	7.42
Total / average	**67**	**35122**	**23.40**

23 billion Tsh is less than the annual increase in recurrent budgets over the last years and would represent an increase in the share of personal emoluments from 29% to 37% in the 2004/05 budget. It does not seem beyond reach to be able to finance a salary increase of this magnitude over a few years' period. At least for the skilled health workers, there seems to be room for significant salary increases if one is willing to give priority to this issue.

Costs of increased training output:
Ministry of Health recently measured the total costs of training at various government institutions. The average costs were estimated at 2.4 million Tsh per year for advanced diploma students, 2.0 million Tsh per year for diploma students and 1.5 million Tsh per year for Certificate students (MoH, 2005b).

Based on these figures we calculated the costs of increasing training output by 50% relative to the average annual training output in 2000-2004 (Figure 10). We added the costs of 100 additional Medical Officer students per year and arrived at a cost estimate of 7 billion Tsh annually. This amount includes both recurrent costs and annualised investment costs. Due to the need for up-front investment, expenditures will be tilted towards the present.

McKinsey (2004) arrived at a much higher estimate of the costs of such an increase in training output. They estimated added recurrent costs to ~13 billion Tsh annually, and in addition come added capital expenditures of ~45 billion Tsh over a six year period. The large discrepancy between the estimates illustrates the large uncertainties attached to these figures.

[14] Most workers in the "other cadres" group are medical assistants with a monthly salary not much above the minimum wage of 60,000 Tsh. But the group also contains some higher skilled people such as dentists, pharmacists, lab technicians, etc., but these are few in numbers, and the picture would not be much altered by giving higher salary increases to these cadres as well.

Costs of preparing for improved productivity and performance:
McKinsey (2004) also estimated the costs of a package to improve performance which included 1) resources to increase availability of medical supplies, 2) team performance incentives amounting to some 20% increase in salaries, 3) strengthening of continuous education, including upgrading of all Zonal Training Centres. The total costs of this package were estimated to ~27 billion Tsh for recurrent expenditures and ~75 billion Tsh for one-time capital expenditures. The effect of such a package on productivity and performance is however unknown.

5. Knowledge Gaps

Despite several recent in-depth studies of the HRH situation in Tanzania, there still exist a number of knowledge gaps that need to be addressed in order to improve the evidence base for human resource strategies in the health sector. While additional evidence is needed both on the nature of the HRH problem and on which policies that might efficiently address the problem, knowledge gaps are presently largest when it comes to the effect of alternative policy interventions.

5.1. The nature of the human resource challenge

The number of health workers and their geographical distribution:
Quite some evidence is available in this area, but several questions need to be answered more precisely:

- *What is the current total number of health workers, by cadre and by geographical location?*
  Tanzania does not have a well-functioning system to provide up to date information about the total stock of health workers. Even the quality of the most recent HRH Census has been questioned (in particular its coverage of the private sector). This hampers the planning process as well as the process of raising awareness about the health worker issue.
- *What is the appropriate staffing level, by cadre and by geographical location?*
  In order to argue that there is a lack of personnel, the actual number of workers must be compared to some valid standard. Some people argue that the current staffing norms need revision in order to serve as a useful reference for this purpose.
- *What are the dynamics of the health worker labour market?*
  In order to predict future HRH gaps, it is essential to know the processes that are taking place in the labour market. Questions include:
    - *What are the attrition rates in various cadres and in various age groups, and where do they go?*
    - *What are the emigration rates, in various cadres?*
    - *Which geographical migration patterns are observed within Tanzania?*
    - *How many candidates are recruited into the private health sector?*
    - *What is the pattern of mobility between public and private health facilities?*

The productivity and performance of the health workforce:
This area is characterised by only scattered evidence. A main challenge is to provide more accurate estimates through larger and more representative samples in order to improve our knowledge on questions like:

- *What is the rate of absenteeism at health facilities?*
- *Are the available estimates of potential productivity improvements of the health workforce representative of the country?*
- *What is the actual skill level of the health workforce, at various facilities/locations (i.e., measuring what health workers are capable of doing in practice).*
- *To which degree are health workers performing according to their potential?*
- *Are patients treated in ways that reduce their usage of health services?*
- *What is the role of low motivation and morale in explaining poor productivity and performance?*

5.2. The costs and effectiveness of human resource interventions

At the end of the day, the key issue for policy makers is to know which policy interventions that will deal with the human resource challenges in the most cost-effective way. An analysis of the *potential* of various strategies to address the problems will never bring us more than half-way towards an answer to this question, because it remains to be analysed which interventions that are able to *release* the potential improvements most effectively. For instance, although there is probably a huge potential for improved productivity in the health sector, it is far from obvious which policy interventions (and at which scale) that will be able to release this productivity potential.

The effectiveness of alternative interventions is largely an unexplored area. For instance, we do not know the effect of interventions that seek to attract health workers back into the workforce, partly due to limited knowledge about the number of inactive health workers, and partly because we do not know how strong incentives are needed in order to attract these workers back. Similarly, the effect of interventions to reduce geographical imbalance is unknown because we do not know what it would take to induce a sufficient number of people to work in rural areas. And what are the most effective policies for making health workers perform closer to their potential? There is a huge number of research questions of this kind that are waiting to be addressed.

Some policy interventions are likely to have an impact on a number of the strategic objectives. For instance, improved working conditions may attract inactive health workers back to the health sector at the same time as they may reduce attrition and increase worker motivation and efforts, thus improving productivity and performance. It may therefore be useful to structure future research efforts around the set of available interventions and try to identify the impact of various interventions on each of the strategic goals. For this purpose, we have classified available interventions under four broad headings:

1) **Organisation, management and control:**
Regulation of demand for health workers through the number and location of health facilities, regulation of supply of health workers through training output, hiring and firing procedures, bonding arrangements, management of health workers at district and facility level, monitoring of productivity and performance, etc.

2) **Skill level and mix:**
Curricula development of pre-service and in-service training, capacity for continued education at various levels, incentives for continued education, criteria for selection of workers who are offered continued education (including workers in private facilities), organisation of teams with complementary skills, etc.

3) **Salaries, rewards and incentive schemes:**
Salary levels for each cadre, promotion schemes, productivity and performance based incentives, team incentives or individual incentives, non-monetary reward mechanisms, disincentives for emigration, etc.

4) **Working conditions:**
Staffing level, physical infrastructure, equipment, drugs, working hours, transport, housing, opportunities for schooling for children, psycho-social environment, etc.

The general research questions are:

- What is the contribution of each of the policy instruments in addressing the main strategic challenges (i.e., increased recruitment, reduced voluntary attrition, improved productivity and performance, and better geographical balance) and, thereby, in strengthening human resources for health in Tanzania?
- What are the costs of the interventions?

These general questions embrace a broad research agenda which will require a multitude of research methods and approaches. Some questions may be fruitfully addressed by comparing outcomes across facilities. For instance, outcomes like motivation, quality and productivity are likely to differ substantially across facilities. By comparing background variables at "high outcome" facilities with background variables at "low outcome" facilities, lessons will be learnt about how to achieve improved motivation, productivity and performance.

Other questions will require more sophisticated research tools. For instance, the effect of salaries on worker motivation and effort may be difficult to assess by comparing facilities, simply because the salary level is quite uniform across facilities, at least in the public sector. In such cases, controlled experiments will be useful. By making interventions affect only one group at a time, for instance through sequential implementation, it will be possible to rigorously identify the effect of the interventions.

Experiments of this kind are likely to be a very useful approach in measuring the effect of alternative interventions for strengthening the health workforce. Successful building of knowledge will however require close collaboration between policy makers and researchers in order to design experiments that are both scientifically valid and politically feasible.

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SUMMARY

The number of health workers in Tanzania has declined sharply over the last decade. The present number of health personnel in Tanzania is low both by international standards and relative to national staffing norms, and an even greater shortage of health workers is expected in the future. Due to geographical imbalance in the distribution of health workers, the shortage is most strongly felt in rural areas. The shortage is amplified by low productivity and sub-standard performance in some parts of the health workforce.

Although the human resource situation of the Tanzanian health sector seems to be recognised as a crisis by the political leadership, the fundamental reasons for the crisis have yet to be addressed. Among the challenges ahead are the need to place the human resource issue higher on the agenda in national policy processes and documents, the need to address financial constraints, the need for further evidence on which policies are most effective in addressing the various aspects of the problem, and the need to strengthen the Human Resource Department of the Ministry of Health.

An important challenge for health policy makers in Tanzania is to design a human resource strategy that appropriately reflects and responds to the current crisis. This report presents a framework that may form the basis for such a strategy process. It also presents existing evidence of relevance for the choice among available strategic options.

The report also identifies knowledge gaps that need to be addressed in order to improve the evidence base for human resource strategies in the health sector. Knowledge gaps are large when it comes to the effect of alternative policy interventions, and intervention based studies are called for in order to fill these gaps.

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