
A grey square containing the white text "9-11" in a large, serif font.

Brain Drain of Health Professionals in Tanzania

By:

Adinan Juma

Allen G. Kangalawe

Elizabeth Dalrymple

Tiwonge Kanyenda

**CASE STUDY #9-11 OF THE PROGRAM:
“FOOD POLICY FOR DEVELOPING COUNTRIES: THE ROLE OF
GOVERNMENT IN THE GLOBAL FOOD SYSTEM”
2012**

Edited by:

Per Pinstруп-Andersen (globalfoodsystem@cornell.edu)

Cornell University

In collaboration with:

Søren E. Frandsen, Pro-Rector, Aarhus University, Denmark

Arie Kuyvenhoven, Professor Emeritus and
Former Director, Wageningen School of Social Sciences, The Netherlands

Joachim von Braun, Director, Center for Development Research (ZEF),
Bonn University, Germany

Executive Summary

Migration of health professionals worldwide has resulted in an unequal distribution of medical staff globally. The movement of medical staff out of some developing countries, often termed “brain drain,” affects the health care system at multiple levels, including both doctors and nurses. Medical staff are leaving their countries because of both push and pull factors. Pull factors include better remuneration and working environment, job satisfaction, and prospects for further education. Push factors include lack of education opportunities, poor working environment, poor infrastructure, and lack of diagnostic equipment. Apart from push and pull factors, the mobility of medical professionals is influenced by their links to the receiving countries. This movement of medical professionals leaves the sending country not only with a shortage of medical professionals, but also increased morbidity and mortality. Without medical personnel, there cannot be timely diagnosis and intervention in the course of disease.

Currently there is a global shortage of 4.25 million health care workers, with Sub-Saharan Africa alone in need of more than half of these workers (WHO 2006a). This shortage is fueled in part by the brain drain of medical personnel. As of 2006, Tanzania, with a population of 40 million, had only 1,264 doctors working in the country and 1,356 doctors working abroad. Tanzania will need to triple its number of doctors if it is to achieve the Millennium Development Goals of reducing child mortality and improving maternal health.

The crisis of health workers is one of the most significant obstacles to improving the health system in Tanzania and other African countries. The global workforce crisis can be tackled if there is global responsibility, political will, financial commitment, and public-private partnerships for country-led and country-specific interventions that seek solutions beyond the health sector. Only when enough health workers can be trained, sustained, and retained in Sub-Saharan African countries will the region attain the Millennium Development Goals.

Your assignment is to advise the government of Tanzania and other developing countries on a policy to attract health workers to clinical settings

within their home countries, taking into account the interests of the important stakeholder groups.

Background

The world economic recession in the 1980s left many African countries destitute as they experienced large drops in national incomes. To finance the provision of social services, most countries turned to external borrowing (World Bank 1991). Over time, the overall increase in debt prevented countries from apportioning a large part of their budgets to health, education, and infrastructure development. The neoliberal agenda gave rise to the emergence of nongovernmental organizations (NGOs) as alternative means of providing efficient social services to the public (World Bank 1988). Development aid was channeled through these NGOs, which offered better pay and working conditions that lured professionals from the declining civil servant sector.

These economic changes led to deterioration in the effectiveness of health systems, and most post-independence gains were sharply reversed. Child mortality rates rose as immunization coverage rates declined. Reforms led to the introduction of user fees for health services and liberalization of drug sales. The continued decline in social spending paralyzed public health systems. There was no funding for medical equipment and maintenance, and salaries and working conditions also declined. In Tanzania, the health system suffered from the lack of training and poor motivation of doctors and health workers, shortage of supplies, breakdown of transportation, and inadequate management. The quality of hospital care declined and clinics became crowded (World Bank 1991).

“Brain drain”—which refers to the movement of skilled and qualified professionals out of certain areas in search of better working conditions, salaries, and quality of life—has been evident in Sub-Saharan Africa since the 1990s (Pang, Lansang, and Haine 2002). Three types of brain drain exist at different scales around the world. First, migration of medical professionals, generally from developing countries to developed countries, describes brain drain on the global scale. Second, at the

national level, health professionals may move within a country from rural areas to urban areas to work. Third, “brain waste” refers to the movement of medical personnel from the health sector to other sectors of work. All three types of brain drain contribute to shortages of medical professionals in certain areas worldwide. This migration of health professionals has contributed to the weakening of the fragile African health system. It is imperative that the availability of health professionals be addressed if Sub-Saharan Africa is to progress politically and economically.

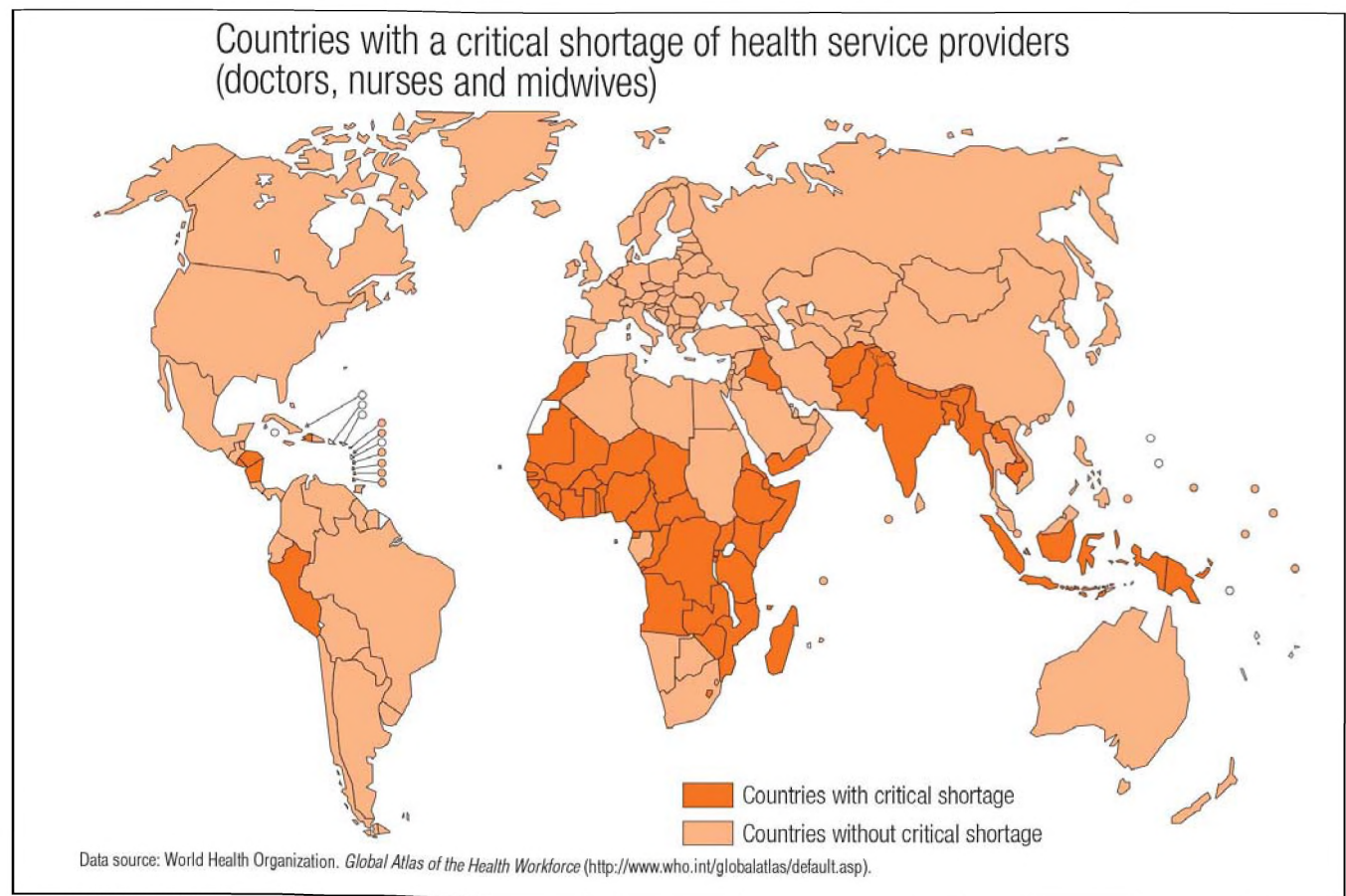
Global Situation

The global inequity in the location of health professionals disproportionately affects Africa, and specifically Tanzania. In 2006 there was a global shortage of 4.25 million doctors, midwives, nurses, and support workers (WHO 2006a). Of the 57

countries that had a severe shortage, 36 were in Sub-Saharan Africa (United Nations 2010) (Figure 1). The health implications of this global inequity are stark. The United States and Canada have 37 percent of global health professionals whereas Sub-Saharan Africa has only 3 percent of medical personnel worldwide but carries 24 percent of the global burden of disease (Mmbando 2009). To decrease this burden of disease, health professionals must be available to give care. This global inequality is a result of the first type of brain drain, where medical personnel leave developing countries to work in developed countries.

Great Britain, the United States, and France have the highest number of doctors from abroad. With a third of their doctors coming from abroad, Great Britain and the United States are heavily reliant on this outside source of personnel.

Figure 1: Countries with a Critical Shortage of Health Service Providers



Source: WHO 2006b.

Table 1: Native African Physicians Working Domestically and Abroad

| Sending country | Domestic | Receiving country | | | | | | | | | Total abroad | % |
|---------------------|----------|-------------------|---------------|--------|--------|-----------|----------|-------|---------|-------------------|--------------|----|
| | | Great Britain | United States | France | Canada | Australia | Portugal | Spain | Belgium | South Africa | | |
| Tanzania | 1,264 | 743 | 270 | 4 | 240 | 54 | 1 | 1 | 3 | 40 | 1,356 | 52 |
| Kenya | 3,855 | 2,733 | 865 | 0 | 180 | 110 | 1 | 4 | 1 | 81 | 3,975 | 51 |
| South Africa | 27,551 | 3,509 | 1,950 | 16 | 1,545 | 1,111 | 61 | 5 | 0 | -834 ^a | 7,363 | 21 |
| Malawi | 200 | 191 | 40 | 0 | 0 | 10 | 2 | 1 | 1 | 48 | 293 | 59 |
| Botswana | 530 | 28 | 10 | 0 | 0 | 3 | 0 | 0 | 1 | 26 | 68 | 11 |
| Somalia | 310 | 53 | 70 | 0 | 25 | 3 | 0 | 0 | 0 | 0 | 151 | 33 |
| Mozambique | 435 | 16 | 20 | 0 | 10 | 3 | 1,218 | 4 | 2 | 61 | 1,334 | 75 |
| Ethiopia | 1,310 | 65 | 420 | 16 | 30 | 9 | 1 | 1 | 2 | 9 | 553 | 30 |
| Algeria | 13,639 | 45 | 50 | 10,594 | 10 | 0 | 2 | 60 | 99 | 0 | 10,860 | 44 |
| Egypt | 143,555 | 1,465 | 3,830 | 471 | 750 | 535 | 1 | 17 | 31 | 19 | 7,119 | 5 |
| Africa ^b | 280,808 | 15,258 | 12,813 | 23,494 | 3,715 | 2,140 | 3,859 | 1,096 | 1,107 | 1,459 | 64,941 | 19 |
| Sub-Saharan Africa | 96,405 | 13,350 | 8,558 | 4,199 | 2,800 | 1,596 | 3,847 | 173 | 696 | 1,434 | 36,653 | 28 |

Note: The table shows the number of physicians in some African countries who are working within the country and those who have moved to work outside their country of birth. Data for France are from 1999; data from the United States are from 2000; data from the rest of the countries are from 2001.

^a Number of physicians born in the eight receiving countries and working in South Africa.

^b Total number of physicians born in Africa who are working in their respective countries and those who migrated.

Source: Clemens and Pettersson (2008, 8).

Situation in Africa

It is difficult to estimate the number and effects of migrating health professionals because there are no reliable data from the sending countries. Data from receiving countries have shown, however, that about one-third of practicing physicians in the United States come from developing countries, including Sub-Saharan African (World Bank 2011; Hagopian et al. 2004). Brain drain affects multiple levels of the health care system, with doctors and nurses making up a majority of the 20,000 health professionals that leave Africa annually (Barka and Ofori-Sapong n.d.).

The minimum standard set by the World Health Organization (WHO) to ensure basic health care services is 20 physicians per 100,000 people. While Western countries boast an average of 222 physicians per 100,000 people, 38 countries in Sub-Saharan Africa fall short of the minimum standard, and 13 of these countries have 5 or fewer physicians per 100,000 people (Barka and Ofori-Sapong n.d.). Tanzania and Malawi have the lowest doctor-patient ratio, with only about 2 doctors per 100,000 people (WHO 2006a). One reason Africa, and specifically Sub-Saharan Africa, are disproportionately affected may be that health professionals in developing countries in the Commonwealth speak English and can therefore easily function in the United States and United Kingdom (Johnson 2005).

Countries receiving health professionals, such as the United States, save money by not having to train the personnel. For example, 130,000 international medical graduates have saved the United States more than US\$26 billion in training costs (Mmbando 2009). However, these savings come at the expense of the countries that trained the health professionals. After spending money on training personnel who leave, these countries must spend extra money to fill the job openings. To fill the human resource gap created by brain drain, Africa employs up to 150,000 expatriate professionals at a cost of US\$4 billion a year (Barka and Ofori-Sapong n.d.).

The United Nations Commission for Trade and Development has estimated that each migrating African professional results in a loss of US\$184,000 to Africa (Pang, Lansang, and Haine 2002). The Kenyan government, for example, loses US\$517,931 worth of returns from investment when a medical

doctor leaves the country and US\$338,868 when a nurse leaves (Kirigia et al. 2006). These large monetary losses reflect the accumulated cost of training the health professionals. Tanzania, for example, pays for some of its medical students to attend college in two different ways. First, those who excelled in their advanced level education can receive full scholarships. Second, some students receive no-interest loans of various amounts, depending on need. These investments become economic losses if the students decide to leave the country and work elsewhere.

The loss is, however, more than economic. Coming on top of Africa's high burden of disease and initial low production of health professionals, the transfer of personnel leaves the health system ill equipped to handle its patient burden and hinders the continent's development. If the Millennium Development Goals are to be met by 2015, the deficit of health care workers must be addressed immediately (United Nations 2010).

Situation in Tanzania

In 2006 the WHO identified Tanzania as experiencing a critical shortage of health workers (United Nations 2010). Medical professionals in Tanzania are both moving out of the country and moving from rural areas to urban areas. As of 2000, about 52 percent of Tanzania's native-born doctors were working abroad (Clemens and Pettersson 2008). Tanzania has 1,264 native-born doctors working in the country and 1,356 working abroad. In contrast, only 4 percent of Tanzania's nurses are working abroad, a much lower percentage than many of its Sub-Saharan African neighbors (Clemens and Pettersson 2008). Still, Tanzania is greatly affected by the migration of its health professionals, especially doctors, out of the country (see Table 1).

The economic loss to the country is also significant. The Tanzanian government spends US\$27,256 to train each medical student from primary school through medical school. It is estimated that Tanzania has spent US\$3.49 million training Tanzanian-born doctors who are currently practicing in Australia, Canada, the United Kingdom, and the United States (Mills et al. 2011).

Migration of health workers from rural to urban areas is a growing concern, and the shortage of workers in rural areas is severe. In Tanzania, "the capital city of Dar es Salaam alone has nearly 30

times as many medical officers and medical specialists as any of the rural districts" (Anyangwe and Mtonga 2007, 95). A study conducted in Tanzania showed how this understaffing in rural areas increased the work burden on health workers in these areas. One female nurse auxiliary explained, "Say at every centre you have got one nurse and one doctor. If it happens that the doctor faces a problem the nurse will be alone. Now she will do the cleaning and dispense drugs and deal with patients....You often find that work to be done by two or three people is performed by a single person" (Manongi, Marchant, and Bygbjerg 2006, 4; Muula 2005). This poor quality of care contributes to Tanzania's burden of disease and disability, which are disproportionately found in rural areas.

In addition, the tension between NGO-run hospitals and enclaves and government-run facilities runs high. In the early 2000s, health sector reforms made positive improvements in government facilities and hospitals. The Ministry of Health provided training and seminars to assist in the transition during the reforms and introduced income-generating initiatives for the health facilities. Although the health sector reforms provided positive change in government health facilities, salary improvements were minimal in light of increased cost of living and inflation. NGO facilities with higher budgets can provide higher salaries than the government. But these NGOs often create inequities in the distribution of both salaries and training. In so doing, they attract more health workers, leaving government facilities understaffed, and threaten the structure of the health system (Sullivan 2011).

Causes of the Brain Drain

The mobility of health professionals depends on their personal values as well as on the interplay of complex social, political, and economic forces in both sending and receiving countries. Underlying all these issues is a weak health system with poor infrastructure and minimal equipment in the sending countries. A combination of push and pull forces often results in the net outflow of health professionals from African countries. It is crucial for policy makers to understand the interaction between these forces in order to make informed decisions about retaining workers and improving the overall health system.

Push factors in developing countries like Tanzania are low salaries and poor working conditions,

including lack of incentives and lack of proper supervision (Manongi, Marchant, and Bygbjerg 2006; Muula 2005). Researchers in Tanzania must grapple with lack of laboratory facilities and funds to support innovation. The situation is no different for clinical health workers. The working environment consists of poor infrastructure and lack of diagnostic equipment, which translates to decreased morale among the workers. As a female clinical technician in Tanzania said, "We don't have a microscope or even a laboratory. So we are only doing diagnosis and using our experience to decide. This is like playing a game of chance (*Kamar*) for the money as you are not sure if you are treating malaria or typhoid or both. I do feel hurt more than the patient himself. This is really discouraging for us working in these dispensaries" (Manongi, Marchant, and Bygbjerg 2006).

Pull factors in developed countries are higher salaries and better living standards and facilities. As one medical intern put it, "I earn insufficient money to cope with daily expenses like school fees, food, and transport, yet I could earn 20 times more than what I am earning here if I decide to migrate" (Medical Intern #1, interviewed on June 13, 2010). This single economic factor has been crucial in migration decisions. It affects the individual's quality of life and the stability of the family. It allows health professionals to meet the social pressure to provide for the extended family.

Non-economic forces that pull people to migrate include promising career prospects and professional opportunities, better research facilities, educational opportunities for children, and strong job satisfaction (OECD 2002). In the developed countries, medical researchers are often provided with funds to pursue their interests. Developed countries also have vast opportunities for career advancement and development that are not available in Tanzania. "If I decide to go abroad, my work will be rewarded accordingly" (Medical Intern #1, interviewed June 13, 2010). The fact that professional achievement is recognized and rewarded is seen as an incentive for working hard. The academic environment encourages intellectual freedom, in contrast to Tanzania, where intellectual freedom is stifled and it is difficult to translate one's ideas into new programs. The existence of migrant professional networks in the receiving countries also helps facilitate the movement of these professionals (Sullivan 2011).

Behind these pull factors is the shortage of health professionals in OECD countries. Advances in

technology have helped increase life expectancy across the globe. As populations have aged in developed countries, not enough young people have entered the medical profession. Reasons for the shortage of health professionals in the OECD countries include the rising cost of attaining a medical education and the length of training. Most young people prefer shorter courses of study, such as computer science or business, which have a high and quick return. In addition, the prospect of malpractice lawsuits faced by health professionals discourages people from entering the field.

Provision of social services has thus become highly dependent on foreign workers. OECD countries have created programs to actively poach African health professionals. The United States, for example, welcomes international medical graduates, and its healthcare workforce depends on them (Zoghbi et al. 2004). The U.S. Diversity Immigrant Visa Program, commonly known as the DV program, is intended to encourage the immigration of “under-represented nationalities.” The program requires applicants to have at least a high school education, but most successful applicants possess higher degrees in strategic fields as stipulated by the US labor market. In 2007, more than 19,000 of the 50,000 slots in the DV program were given to Africans. Tanzania contributed about half a percent, with Egypt, Ethiopia, Nigeria, and Kenya taking a large share of the pie (United States Department of State 2012). In contrast to the US program, the UK Highly Skilled Migrant Program was specifically created to supplement the country’s labor force. Candidates are ranked based on their qualifications, with PhD holders the most highly ranked. Professors and researchers also fall into this category, and those with other advanced degrees are ranked lower. Other factors such as spouse qualifications and access to capital also play a role in determining whether an application is successful.

Clearly, the migrants benefit from better living conditions for themselves and their families, and they can look forward to a better life and abundant career opportunities for themselves and their children. A doctor moving from, for example, Sierra Leone to the UK can expect his or her annual salary to rise from £300 to more than £100,000 and the life expectancy of his or her children to increase from 40 to 79 years of age (Hooper 2008). Medical professionals from Tanzania with similar qualifications could expect similar results.

Despite the prospects of better wages and living conditions, some of the professionals interviewed expressed a desire to remain in their home country. The primary reason for not migrating was cultural and family ties. One of the medical interns interviewed said, “I don’t want to leave relatives and family and everything familiar.” Other reasons for staying in Tanzania were the lack of networks that would enable them to smoothly move abroad, the difficulty in transferring money to their families who remain in Tanzania, the impending culture shock, and the different lifestyle. A less common reason cited was the high cost of migration.

Effects of the Brain Drain

The overall consequence of brain drain is a worldwide inequity in the distribution of health professionals. The term “brain drain” has been questioned and referred to more recently as “brain circulation,” indicating that the knowledge and skills are not simply lost; they go somewhere else (Meyer 2003). In Tanzania, brain drain has affected the distribution of health professionals and contributed to the weakening of the fragile health system. On the other hand, the flow of financial remittances has helped some families cope with the increasing cost of living. At this point in time, the balance between benefits and burdens is unequal, with OECD countries benefiting at the expense of taxpayers in Tanzania.

Benefits to Sending Countries

The countries that lose health professionals benefit in several ways from migration. One benefit consists of the financial remittances from workers that have migrated (see appendix). “In 2010, the flow of remittances to developing countries reached US\$21 billion, more than official aid flows” (Mills et al. 2011). Only 4 percent of these remittances, however, go to Africa (Gupta, Pattillo, and Wagh 2007). Within Africa, the North African countries of Egypt, Morocco, and Algeria are the largest beneficiaries, and Nigeria leads in remittances within Sub-Saharan Africa (Shinn 2008). In some places remittances are formally transferred through banks, whereas in other places they are transferred informally. The preferred informal channels of transferring money in Tanzania makes it almost impossible to estimate the exact amount of remittances it receives. This preference is primarily a result of the increasing cost of formal channels following privatization of banks. As such, the impact of remittances on the living conditions of the

families that stays behind in Tanzania is largely unknown. The literature suggests that a large part is spent on consumption, housing, and land, with little investment in endeavors that would contribute to long-term growth. In other countries such as Senegal, villages have been known to pool remittances for infrastructure development and thus make up for the loss of their skilled young workers (Gupta, Pattillo, and Wagh 2007). Remittances, therefore, represent a relatively untapped benefit to Tanzania.

In addition to monetary benefits, the sending countries benefit from the skills of migrated professionals who return home. Professionals who practice in developed countries receive training and experience that may be unavailable in their home countries and may return to their home countries with these new skills. This migration and exchange of knowledge allows professional networks to form between developed and developing countries (Hooper 2008, 685). The Diaspora Option, which sees migration of health workers as inevitable, discusses the possibility of “virtual participation.” Health professionals can share their knowledge with their home countries through collaborative research (Barka and Ofori-Sarpong, n.d.). World-wide partnerships may help the country’s economic status and increase exchange of knowledge.

Burdens to Sending Countries

The burdens faced by the sending countries may outweigh the benefits. First, the migration of medical professionals results in a lack of personnel in the abandoned areas. Rural areas house half of the world’s population but less than 25 percent of doctors and only 38 percent of nurses (United Nations 2010). The brain drain is thus not just an international problem, but a serious concern within countries. In addition, the low doctor-to-patient ratio in developing countries, as discussed previously, shows the unequal global distribution of medical personnel, creating a severe deficiency in care in developing countries. Although there are a variety of reasons for the lack of care, one is certainly the lack of physicians.

The fiscal impacts of brain drain may include potential loss of tax revenue. When health professionals migrate, they reduce the tax base on which

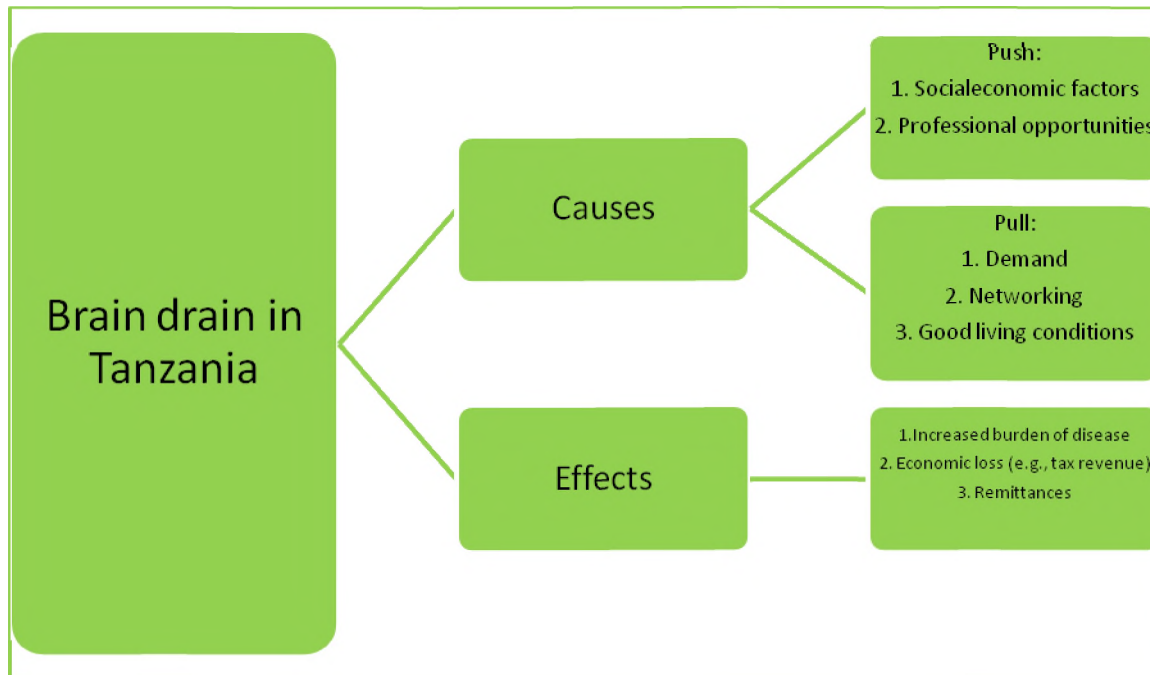
government operates and thus indirectly affect the provision of social services in the country. In addition, the government loses its return on an investment made, given the high percentage of government spending on education. Currently, Tanzania spends about 11.4 percent of its annual budget on education—five times higher than the global average. Every time Tanzania loses a health professional, it costs the country about US\$27,256 that was invested in education, while the developed country saves on education spending. Although some may argue that these costs are repaid in remittances or in skills that the professional brings back, these returns are not guaranteed when the person migrates. The fact that the country lost an important aspect of the health production chain means a decrease in expected returns.

Effects on Medical Professionals

Brain drain affects medical professionals themselves. Those who stay behind often become overworked and overburdened because of the large case load and worker shortage. As a result of the shortage, hospitals have sought the assistance of medical students in sustaining the functioning of hospitals. One medical student claimed, “The hospital is being run by students” (Medical Student #3, interviewed June 15, 2010). Not only medical personnel, but also their supervisors are overworked and cannot adequately do their job. They may not be correctly trained and do not have the time to give feedback to the medical students. Therefore, the professionals feel underappreciated (Manongi, Marchant, and Bygbjerg 2006). Despite all these setbacks, the experiences and challenges of these professionals could be summed up in a statement from Medical Doctor #2: “I’m not living a bad life, but it could be better” (interviewed June 16, 2010). Improving the conditions of these health professionals could go a long way in improving the care delivered to patients and possibly give a facelift to the health system.

Figure 2 provides a summary of the main causes and effects of brain drain in Tanzania. (An expanded flow chart that includes the basic, intermediate, and underlying causes and effects of the brain drain is in the appendix.)

Figure 2: Summary of the Causes and Effects of Brain Drain in Tanzania



Policy Issues

Global

Currently, the international approach to mitigating the negative effects of brain drain has been ineffective and unenforceable. There is little cooperation in developing and implementing policies to curb brain drain at the global scale, given the competing interests of sending and receiving countries. Consequently, much of the emphasis has been placed on the individual responsibility of countries, with the receiving countries showing little initiative in advancing a global collaboration to prevent brain drain. Currently, the only global scheme against brain drain is outlined in the WHO Code of Practice on International Recruitment of Health Professionals. This code of practice has major gaps that make its validity and effectiveness questionable. First, the code is completely voluntary, and the WHO has no way to assure that it is integrated into countries' policies. In addition, it addresses only the receiving countries, not the sending countries. According to Hagopian et al. (2004, 8), "Single country policies are unlikely to alter the flows significantly." Cooperation from both countries needs to occur in order to effect change. Because the flow of health professionals involves the dynamic between the sending country and the

receiving country, a policy or code that addresses only half of the situation lacks force. The existing international policies on migration of health workers need to be improved if the trend is to be reversed.

National

One relevant policy issue that exists at the national level is the gap between urban and rural working and living conditions. The unequal distribution of education opportunities, technology, infrastructure, and electricity favors life in urban areas over rural areas. Therefore, health workers generally migrate to urban areas if given the choice. Rural areas lack adequate equipment and staffing. These conditions are stressful and undesirable, yet salaries do not compensate for these drawbacks.

Besides the working environment, living conditions are drastically worse in rural areas. The availability of Internet service affects a person's ability to stay connected to families and friends and to get information and news. A study by Furuholt and Kristiansen (2007) found that in the three rural regions of Tanzania studied, there were 16 times

more people per Internet café than in urban Dar es Salaam. In addition, education opportunities are less appealing in rural areas. A teacher chosen to work in Yamba, a rural village in Tanzania, expressed the challenge of teaching when 232 children were registered to attend, with only two teachers available (Jones, n.d.). Health professionals do not want to move to an area that offers no appropriate opportunity for their children to go to school. A nursing student stated, "The problem is that people do not want to work in rural areas....This is because what you get in town you can hardly find or not find at all in rural areas" (Nursing Student #2, interviewed July 15, 2010). Without the cooperation of the different sectors that affect living conditions, rural areas will remain inadequate living environments. Finding a way to decrease this gap would make working in rural areas more appealing and attract more health workers.

Medical Community

Tanzania is experiencing a health worker shortage, and one way to address this lack of personnel is to produce more Tanzanian-born doctors, yet no programs are in place to encourage prospective students to join the medical field. The task is made more difficult by the high cost of medical school. The medical officer at one of the hospitals explained that the expense of medical school often deters people from entering (Medical Doctor #3, interviewed June 16, 2010). In addition to hurting Tanzania's ability to produce doctors, this situation chases people out of the country. First, the country does not have a system of keeping track of loan payments, so health workers may leave the country to evade payment. Others may feel obligated to move abroad to make a high enough salary to pay back their loans. A nursing student expressed her concerns by saying, "I'll be required to pay back the loan I took. Where will I get it if I'll be working in Tanzania, where the salary is low and many of my relatives will be looking to me expecting financial aid?" (Nursing Student #1, interviewed June 15, 2010).

Stakeholders

The previous sections have highlighted the impact of brain drain on the economic, social, and political development of African countries. Until recently, most African governments took little initiative to address the loss of skilled medical professionals to developed countries. There was little or no effort

to seek the input of medical personnel in improving health service delivery through motivation and work satisfaction. The challenge for many developing countries is acquiring the power to change policies. This effort will require monetary commitment, extensive and regular follow-up, and adaptation of policies to unplanned issues that may arise. This section discusses the current impact and influence of the stakeholders in policy making and implementation, starting from the currently most influential to the least. Table 2 summarizes the interest and influences of these stakeholders

Governments of Receiving Countries

The United States, United Kingdom, and Canada receive the most health professionals from developing countries such as Tanzania. Tanzania has 1,264 native-born doctors working in the country and 1,356 working abroad. Only 4 percent of Tanzania's nurses are working abroad, a much lower percentage than many of its Sub-Saharan African neighbors (Clemens and Pettersson 2008). By employing foreign professionals to fill the gaps in their health sector, these receiving countries save on training costs. For instance, it takes about US\$66,000 to train a medical doctor from primary school to university in Kenya (Kirigia et al. 2006). In the United States, this amount does not cover even the cost of an undergraduate education, let alone medical school (Barka and Ofori-Sarpong n.d.). The United States, which employs half of all doctors from English-speaking countries, wants to employ at least 1 million more health care workers in the next 15 years (Cooper 2004)—the exact number Sub-Saharan Africa needs to attain the Millennium Development Goals (Cash 2005).

Currently, the receiving countries possess the greatest influence in policy development and implementation. Any policies disturbing this free flow of labor that supplements their ailing health systems could be detrimental to not only their health systems, but also their national development. A sick population is more likely to have reduced economic and social productivity. The receiving countries are unlikely to adopt agreements that will raise the health risks faced by their populations.

Governments of Sending Countries

Sending countries, which include most developing countries, have an interest in retaining the health professionals they train. Overall these governments have a strong influence. Some ministries, however, are more directly affected and are capable of

implementing policies, whereas other ministries have no power in the policy-making process related to the loss of health professionals.

Ministry of Health and Social Welfare. The Tanzania Ministry of Health and Social Welfare is responsible for reducing the disease burden by improving the overall health services in the country, increasing the number of health professionals, and developing disease preventative strategies at the national level. The ministry may improve the health system by focusing on provision of primary health care through dispensaries in every village. Along with this, it is also responsible for equipping these dispensaries and providing well-trained personnel capable of running these health service provision facilities.

The Ministry of Health and Social Welfare has high influence among all government departments. Since the provision of quality care is hindered, the performance of the ministry is poor when affected by brain drain. The ministry can act as an avenue for improving work satisfaction, working conditions, and supervision of health workers.

Ministry of Education and Vocational Training. The main role of the Ministry of Education and Vocational Training is to provide and increase access to all levels of education for its population. Education must be affordable, accessible, and of high quality. Educational content should fit the country's needs while also training global citizens. To increase the number of trained medical personnel to meet the needs of a rising population, this ministry has power to increase the number of training institutions.

This ministry has considerable influence in developing and implementing policies that would help reduce the brain drain. By providing affordable education, it may increase the enrollment of students in medical colleges and universities.

World Health Organization

The WHO, which assesses health conditions around the globe, is interested in promoting health and decreasing the global disease burden. It advises on health policies, priority areas, and techniques for interventions. As an international organization, the WHO sets out many health policies that countries may then adapt to their own conditions. Such policies or recommendations are usually used to gauge

the social, economic, and health development of countries.

The WHO is also interested in helping solve the crisis of unequal distribution of health workers in the world. Currently, though, the WHO has little influence over the migration of health professionals from Tanzania to the developed countries. Because it is only responsible for developing and recommending health policies, adoption of its policies is mostly voluntary. In the past, the WHO has suggested the ethical recruitment of health professionals, but it does not have the right to regulate migration. This lack of regulatory power limits its influence in the health arena. The WHO could have great influence in this area if it created a treaty on migration to which countries could become signatories. Such a framework would serve as a starting point for negotiating compensation practices following the loss incurred from migration of the health professionals.

Health Workers

This category of stakeholders includes medical doctors, nurses, and health administrators in Tanzania. These medical personnel have a high interest in the problem of brain drain and the causes of migration, but they hold medium-low influence. The personnel are mainly interested in treating patients effectively, having a sufficient salary to ensure good quality of life, and working in good conditions on a day-to-day basis. Their influence in policy making, however, is not high. They have more potential influence than students because they are actually in the workforce, but currently they do not exercise this possible influence very effectively. They could unite to approach the government with requests and concerns, but so far they have not taken advantage of this opportunity.

All experts and medical professionals interviewed mentioned similar concerns: salaries, living conditions, work environment, and the large burden of patients due to understaffing. When asked about the causes of the emigration of health professionals to urban areas or abroad, every interviewee started by mentioning salary. Medical Doctor #1 stated, "At the end of the day, people need money for transportation, for education of children, for housing, etc." (interviewed June 13, 2010). Although other factors were mentioned, including motivation and support, money was the greatest factor in the movement of health professionals seeking better lives. A doctor at Mawenzi said that the desire for

a greater salary may bring professionals to urban areas because these are the areas that have more research projects and higher-paying administrative jobs (Medical Doctor #3, interviewed June 16, 2010).

However, another main concern of most health professionals was the living and working environment in rural areas. Medical Doctor #1 stated, "People would rather live where there is electricity, good housing, communication, and solid infrastructure" (interviewed June 16, 2010). He went on to specify that these services are much more readily available in urban areas than rural areas. Many medical professionals weigh the needs of their families heavily in the decision of where to seek work. The lifestyle available for the rest of their family, the prospect of higher education, and the ability to easily navigate through a town all influence medical professionals' decisions about where to work, in addition to salary.

Although much research cites the doctor-to-patient ratio, nurses also play a large role in the effective functioning of the medical system. Because of understaffing, all personnel are often overworked and forced to perform tasks they were not trained to do. For example, nurses may have to work as clinicians or pharmacists and keep medical records. This overburdening pushes nurses to look for better working environments. A nurse at Msaranga Dispensary said, "Increased work load and lack of training opportunities from the government has led to frustration" (Nurse #1, interviewed June 15, 2010). In another study a female nurse auxiliary said, "I'm handling these patients more compared to those of higher cadres...We should be given the opportunity to go for training so as to handle our patients properly..." (Manongi, Marchant, and Bygbjerg 2006).

In addition, a clinical officer at Msaranga Dispensary described the high patient burden in his practice. Because the dispensary is located on the border of Moshi Urban and Moshi Rural, it often receives patients from a larger population pool than it has the supplies and drugs to handle. No matter how much a doctor knows, he or she may not be able to treat patients effectively. In addition, the issue of understaffing plagues the dispensary, along with many other medical care centers. He stated, "The Ministry [of Health] says there should be 1 clinician for every 40–50 patients, so anything under this is seen as normal, when really it is too much. We go by what is written in the book, which

is not conducive to good treatment" (Clinical Officer, interviewed June 15, 2010). He went on to describe how this high patient burden makes each visit rushed. With a larger share of doctors, urban areas have a lower patient load than rural areas, which doctors may find appealing.

College/University Students

This group of stakeholders includes students who are taking health-related courses at the college or university level. This case study focuses on medical students, nurses, and interns. They have a high interest in the policy issues related to brain drain but very little influence on policy decision making. The students' interests lie in wanting to get an affordable, high-quality education that will prepare them for their future jobs. They want to become competent professionals who can treat patients effectively when they begin practicing. In both literature and interviews, however, students acknowledge that they do not have full control over their ability to treat patients because of constraints in the working environment. In a discussion of why students may choose to leave Tanzania, inadequate funds for research and insufficient supplies of drugs and equipment were widely agreed upon reasons. In addition, the "prospect of higher quality of life" was the most commonly cited reason for future departure from Tanzania for work (Mmbando 2009).

A common thread emerged in interviews with medical students and nursing students about their postgraduation plans. Most students said they wanted to work in urban areas instead of rural areas, for varying reasons. A medical student stated, "Obviously I will work in an urban area, where I can get school for my children, easy transportation, and a sophisticated life in general. Rural areas are good when you are talking about pollution, but not quality of life" (Medical Student #3, interviewed June 15, 2010). Several other medical students and nurses mentioned these same factors. Many also expressed a desire to seek further education, which is mainly located in urban areas as well.

Some students, however, cited reasons to stay in Africa or in rural areas. An intern, a nurse, and a medical student said the location of family was a primary reason for staying in Africa, and Tanzania specifically. Students are often inclined to stay near family and friends. In addition, students want to become doctors in order to treat the many people

who suffer from disease and disability. This purpose sometimes draws them to the areas most understaffed. "I like the profession; my intention is to help poor people, so if I want to help them I have to follow them" (Medical Student #1, interviewed June 12, 2010). This medical student described the tension between wanting to work in an urban area or abroad to find a higher quality of life and wanting to help in the areas that need medical professionals most. A system is needed to allow medical personnel to accomplish both ideals in the same place.

These medical students, nursing students, and interns are the future of the healthcare workforce and clearly have opinions on what is important to them in their career. They are the people who will be most affected by salaries, working conditions, and patient burden in the coming years and should therefore have high influence in policy making related to the brain drain and the emigration of health professionals. Currently, however, they hold no power. Because they have not come together to create change, their influence is low.

Patients

Patients are the most important stakeholders in health care. They have a strong interest in receiving high-quality, accessible, and affordable health services. They are most affected by the inadequate medical professionals in rural areas and in Tanzania in general. However, their influence in making policy regarding migration of health professionals is low. Many patients prefer to seek medical attention in the larger facilities, such as regional hospitals, because they know this is where most doctors and diagnostic equipment exist. They often ask themselves, "Why don't I go to the hospital where there are medical officers and working facilities instead of going to the dispensaries where there is no laboratory and facilities?" (Manongi, Marchant, and Bygbjerg 2006). As the regional medical officer mentioned, the goal of having dispensaries in every village is certainly valiant, but if the staff and equipment are not present, the system will still crash (Medical Doctor #1, interviewed June 16, 2010). Because many patients do not trust the lower-level care, they do not follow the designated referral system, which calls for beginning at the dispensary level, then moving to a health center and then to a regional hospital.

One patient interviewed, however, found the services at Msaranga Dispensary to be better than

those at the health center. She only wanted to see one particular clinical officer at the dispensary for her treatment (Patient #1, interviewed June 15, 2010). Therefore, personal preferences and opinions based on experiences with the health system can clearly influence patients. This knowledge can help policy makers understand that if they provide enough staff and services at the dispensary level, patients are more likely to have a good experience and go back, helping the referral system to be used effectively.

Patients have no influence in policy making even though they are the ones the medical professionals are serving and are most greatly affected when the brain drain results in lack of treatment.

Policy Options

This case study has shown the complexity of the problem of brain drain of Tanzanian health professionals. Individuals' right to move as they please conflicts with the need to compensate sending-country governments for the loss of professionals. Tanzania undeniably suffers from a severe lack of healthcare professionals, and therefore an increased burden of disease. However, an intertwined structure of pull and push factors, along with the professionals' own motivations, result in high emigration from Tanzania. Even within the country, rural areas disproportionately struggle with lack of staff and NGOs pull professionals to the private sector. Because this brain drain exists at so many levels, solutions are neither straightforward nor simple. In addition, the lack of data, especially from the sending countries, makes measuring the exact scope of brain drain difficult. Brain drain is also affected more broadly by the economic and structural changes in the country as a whole. Global and national policy options exist to ameliorate Tanzania's brain drain.

Global

On a global scale, the countries losing health professionals and those receiving them need to work together to track the movement of medical professionals so countries can be repaid when necessary. Tanzania's Ministry of Foreign Affairs would need to make this a priority and help oversee it. Such a system would use the embassies in both sending and receiving countries in cooperation with migration offices.

Table 2: The Interests and Influences of Stakeholders in the Brain Drain of Health Professionals

| Stakeholder | Interest | Influence |
|--|--|-----------|
| Government of receiving country | Acquire health professionals cheaply | ***** |
| Government of sending country | Retain health professionals | ***** |
| Ministry of Health and Social Welfare | Reduce disease burden through: <ul style="list-style-type: none"> • Improved health services • Increased number of health professionals • Preventive measures | ++++ |
| Ministry of Education and Vocation Training | Increase number of health professionals Increase access to education | +++ |
| Ministry of Local Government and Regional Affairs | Provide salary packages for the health workers within their designated budget | ++ |
| Other ministries such as energy and minerals, water, infrastructure, and foreign affairs | Link every part of the country with acceptable and usable infrastructure Provide energy for the whole country Do all of this within their budget | + |
| Medical personnel | Treat and save patients Earn an adequate salary (quality of life) Enjoy good working conditions Take care of extended families | **** |
| 4. WHO | Decrease disease burden Increase equity in health professional distribution worldwide | *** |
| 5. Students (college/university) | Decrease disease burden Increase equity in health professional distribution worldwide | ** |
| 6. Patients | Receive high-quality, accessible, and affordable care | * |

Note: * represents the overall degree of influence; the more * the greater the influence. + represents the sublevel degree on influence of each of the ministries within the government of Tanzania.

A re-evaluation of the WHO Code of Practice on International Recruitment of Health Professionals could be a starting point to show a global commitment to better track the international movement of health professionals. The code of practice is a voluntary recommendation that not all countries, including the United States, have chosen to follow. Although Tanzanian-born doctors can send remittances back to their home country, there is no way to calculate whether these sums make up for the loss of the health professionals themselves. Addressing this gap in knowledge or revisiting the structure of the code of practice could better define the problem of brain drain.

Governments of receiving countries should consider adjusting the type and duration of visas given to entering health professionals. Shorter-duration visas would require employees return to their home country more often, increasing the chance that remittances would return to these countries. A better system should be developed to track whether these foreign citizens are entering as students or workers and, therefore, what kind of visa is appropriate. This process would help organize, but not prevent, the flow of health professionals from developing to developed countries.

Sending and receiving countries should also arrange for monetary compensation to be sent to the medical professionals' home country for the loss of these workers. This process would require better tracking of entering and exiting individuals at the migration offices. With accurate tracking, receiving countries would know exactly how much they owe the sending country. The professional's employer would then repay the home country a designated amount of money for their employee. This process will be challenging to administer and will require all medical professionals and other citizens to be educated about the tracking and compensation process. Involving all parties in decision making will help prevent future disagreement and dissatisfaction with the system.

National

At the national level, more health professionals need to move to rural areas to close the gap between rural and urban areas and improve rural health care. The health sector cannot accomplish this goal alone. Concerted efforts by all ministries should create conducive working and living environments in rural areas, affecting not only health professionals, but all rural residents.

In addition to improving the working conditions of health professionals, administration in the health sector needs to be decentralized. Instead of a centralized funding system, lower-tier health facilities should be in charge of their own procurement process, which would meet their own needs. This would improve efficiency, increase responsibility, and reduce bureaucracy in the health sector.

Until conditions are improved, incentives could be given to professionals to work in rural areas. A better system of upgrades and promotions would prevent workers from remaining in the same position for years and growing dissatisfied. A system of tracking doctors inside the country, in conjunction with the international system, could help identify when professionals enter employment at a location and when a promotion may be deserved. In addition, the government should consider offering special incentives for professionals working in rural areas. By improving overall conditions within the country, and in rural areas, Tanzania could help reduce the outflow of medical professionals.

Lastly, students who receive loans from the Tanzanian government struggle to repay them after they graduate. A professional who has loans to repay and a low salary that is heavily taxed may not be able to succeed economically, and may even choose to leave the country for fear of being unable to pay. The government should consider offering tax-free salaries for the 10 years after medical school while the student is paying back his or her loan. This policy would encourage people to go to medical school and then stay in the country after they graduate. On top of this, the government needs to establish a system of tracking medical students, like the system mentioned previously, so that loans can be effectively collected. Currently, the government loses money from borrowers who default on their loans. This money, if collected, can be used to sustain the health system in the future.

Conclusion

Global and national policy recommendations should balance health professionals' right to move with the need to compensate sending countries for the money spent to train these professionals. A solution will require the cooperation of both sending and receiving countries' governments and, within the country, the public and private sectors.

Although financial factors underlie both professionals' incentives to move and losses to the sending country, other factors are also important. Different sectors and ministries within Tanzania should strive to improve working environments, living conditions, and family ties to provide incentives for health professionals to remain in currently understaffed areas. This study of the brain drain of health professionals in Tanzania has shown the need for cooperation globally and locally within the country to lessen the negative effects of brain drain.

Assignment

Your assignment is to advise the government of Tanzania and other developing countries on a policy to attract health workers to clinical settings within their home countries, taking into account the interests of the important stakeholder groups.

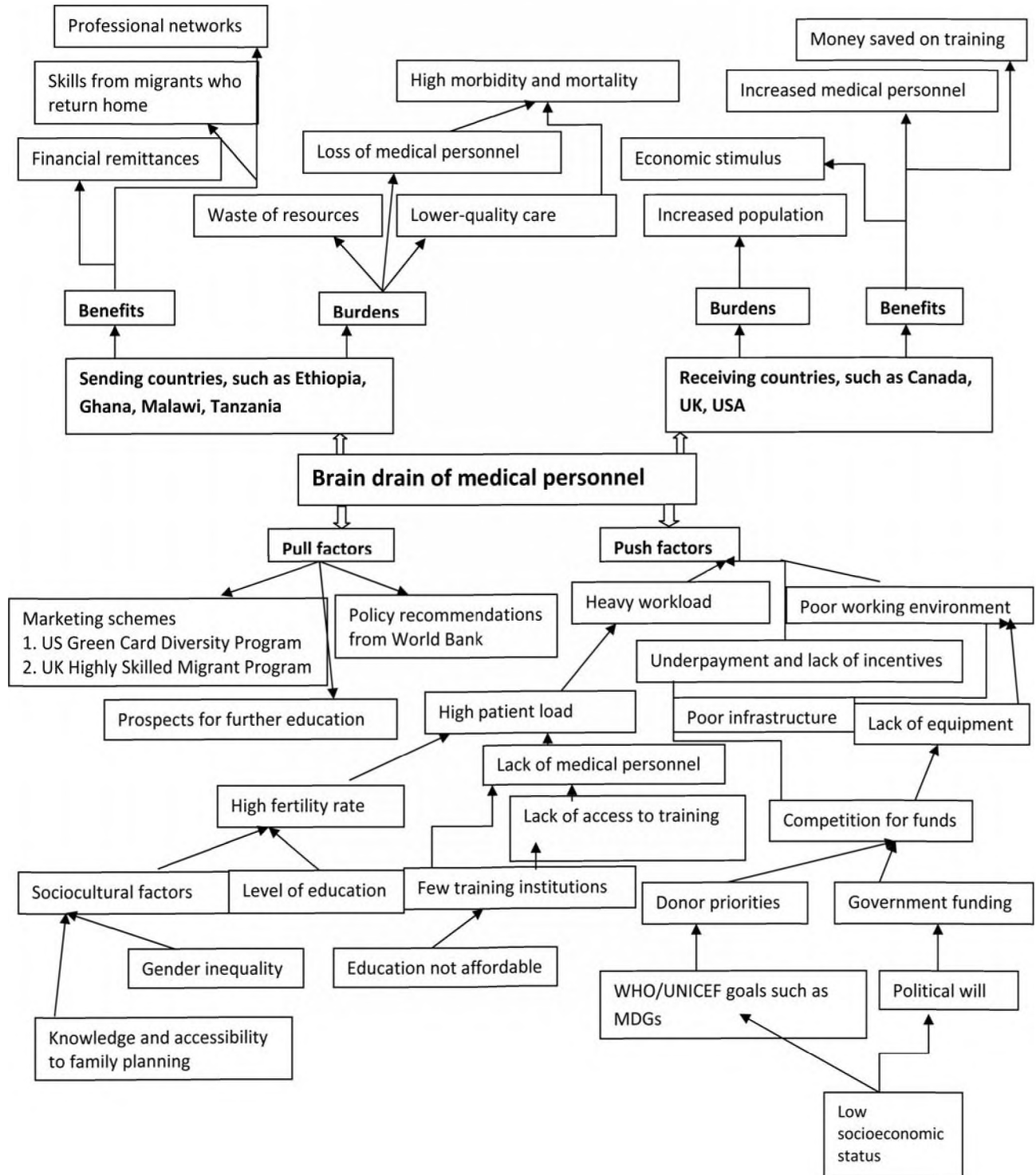
Additional Readings

- Clemens, M. A., and G. Pettersson. 2008. New data on African health professionals abroad. *Human Resources for Health* 6 (1).
<http://www.biomedcentral.com/content/pdf/1478-4491-6-1.pdf>.
- Hooper, C. R. 2008. Adding insult to injury: The healthcare brain drain. *Journal of Medical Ethics* 34 (9): 684–687.
- Manongi, R. N., T. C. Marchant, and I. C. Bygbjerg. 2006. Improving motivation among primary health care workers in Tanzania: A health worker perspective. *Human Resources for Health* 4 (6).
<http://www.human-resources-health.com/content/4/1/6> [accessed June 8, 2010].
- United Nations. 2010. Health workers, international migration, and development. *Population Facts 2010/2/E*. Department of Economic and Social Affairs.
http://www.un.org/esa/population/publications/popfacts/popfacts_2010-2.pdf [accessed July 20, 2010].

List of Interviews

- Clinical Officer. Interviewed by Adinan, Allen, Elizabeth, Tiwonge, notes taken by Adinan, Allen, Elizabeth, Tiwonge. June 15, 2010.
- Medical Doctor #1. Interviewed by Adinan, Allen, Elizabeth, Tiwonge, notes taken by Adinan, Allen, Elizabeth, Tiwonge. June 14, 2010.
- Medical Doctor #2. Interviewed by Adinan, Allen, Elizabeth, Tiwonge, notes taken by Adinan, Allen, Elizabeth, Tiwonge. June 16, 2010.
- Medical Doctor #3. Interviewed by Adinan, Allen, Elizabeth, Tiwonge, notes taken by Adinan, Allen, Elizabeth, Tiwonge. June 16, 2010.
- Nurse #1, interviewed at Msaranga Dispensary. Interviewed by Allen, notes taken by Tiwonge. June 15, 2010.
- Medical Students #1, #2, interviewed at KCMC. Interviewed by Allen, notes taken by Tiwonge. June 13, 2010.
- Medical Students #3, #4, interviewed at KCMC. Interviewed by Adinan, notes taken by Elizabeth. June 15, 2010.
- Nursing Students #1, #2, interviewed at KCMC. Interviewed by Adinan, notes taken by Elizabeth. June 15, 2010.
- Medical Intern #1, interviewed at KCMC. Interviewed by Allen, notes taken by Tiwonge. June 13, 2010.
- Patient #1, interviewed at Msaranga Dispensary. Interviewed by Adinan, notes taken by Elizabeth. June 15, 2010.

Appendix: Basic, Intermediate, and Underlying Causes and Effects of the Brain Drain



References

- Akokpari, J. 2006. Globalization, migration, and the challenges to development in Africa. *Perspectives on Global Development and Technology* 5 (3): 125–53.
- Anyangwe, S., and C. Mtonga. 2007. Inequities in the global health workforce: The greatest impediment to health in Sub-Saharan Africa. *International Journal of Environmental Research and Public Health* 4 (2): 93–100.
- Barka, L., and E. Ofori-Sarpong. N.d. Brain drain in Africa: Facts and figures. ARA Corporation, Orlando, FL. Mimeo. <http://www.aracorporation.org/files/factsandfigures.pdf> [accessed July 23, 2010].
- Bhorat, H., J.-B. Meyer, et al. 2002. Skilled labour migration from developing countries: Study on South and Southern Africa. International Migration Papers No. 52. Geneva: International Labour Office.
- Cash, R. 2005. Ethical issues in health workforce development. *Bulletin of the World Health Organization* 83: 280–84. <http://www.who.int/bulletin/volumes/83/4/280.pdf> [accessed September 8, 2012].
- Clemens, M. A., and G. Pettersson. 2008. New data on African health professionals abroad. *Human Resources for Health* 6 (1). <http://www.biomedcentral.com/content/pdf/1478-4491-6-1.pdf> [accessed April 14, 2012].
- Cooper, R. A. 2004. Weighing the evidence for expanding physician supply. *Annals of Internal Medicine* 141 (9): 705–14.
- Dovlo, D. 1999. Issues affecting the mobility and retention of health workers/professionals in Commonwealth African states. Consulting report for the Commonwealth Secretariat, London. Mimeo.
- Furuholt, B. and S. Kristiansen. 2007. A rural-urban digital divide? Regional aspects of Internet use in Tanzania. *Proceedings of the 9th International Conference on Social Implications of Computers in Developing Countries*. <http://www.ifipwg94.org.br/fullpapers/R0090-1.pdf> [accessed July 23, 2010].
- Gupta, S., C. Pattillo, and S. Wagh. 2007. Making remittances work for Africa. *Finance and Development* 44 (2). <http://www.imf.org/external/pubs/ft/fandd/2007/06/gupta.htm> [accessed July 20, 2010].
- Hagopian, A., et al. 2004. The migration of physicians from Sub-Saharan Africa to the United States of America: Measures of the African brain drain. *Human Resources for Health* 2 (17). <http://www.human-resources-health.com/content/2/1/17> [accessed June 8, 2010].
- Hamilton, K., and J. Yau. 2005. The global tug-of-war for health care workers.
- Hooper, C. R. 2008. Adding insult to injury: The healthcare brain drain. *Journal of Medical Ethics* 34: 684–687.
- ILO (International Labour Organization). 2003. Migrant health workers: Is one country's gain another's pain? Article, December 19. http://www.ilo.org/global/about-the-ilo/press-and-media-centre/insight/WCMS_075617/lang-en/index.htm.
- IOM (International Organization for Migration). 2005. *World migration report 2005*. Geneva. <http://www.migrationinformation.org/Feature/display.cfm?id=271> [accessed July 11, 2010].
- Johnson, J. 2005. Stopping Africa's medical brain drain. *British Medical Journal* 331: 2–3.
- Jones, S. N.d. *Teaching in rural Tanzania*. Pro bono update for Mayer, Brown, Rowe and Maw's London office. <http://www.mayerbrown.com/probono/projects/article.asp?id=3487&nid=3157> [accessed June 23, 2010].
- Kirigia, J. M., A. R. Gbary, L. K. Muthuri, J. Nyoni, and A. Seddoh. 2006. The cost of health professionals' brain drain in Kenya. *BMC Health Services Research* 6 (89).

- Leon, B. K., and J. R. Kolstad. 2010. Wrong schools or wrong students? The potential role of medical education in regional imbalances of the health workforce in the United Republic of Tanzania. *Human Resources for Health* 8: 3 <http://www.human-resources-health.com/content/pdf/1478-4491-8-3.pdf> [accessed June 23, 2010].
- Manongi, R. N., T. C. Marchant, and I. C. Bygbjerg. 2006. Improving motivation among primary health care workers in Tanzania: A health worker perspective. *Human Resources for Health* 4 (6). <http://www.human-resources-health.com/content/4/1/6> [accessed June 8, 2010].
- Mbanefoh, N. 1992. Dimension of drain brain in Nigeria: A case study of some critical high level manpower wastage in the University College Hospital. Ibadan: Nigerian Institute of Social Economic Research (NISER).
- Meyer, J.-B. 2003. Policy implications of the brain drain's changing face. *Science and Development Network*. <http://www.scidev.net/en/policy-briefs/policy-implications-of-the-brain-drain-s-changing-.html> [accessed June 23, 2010].
- Mills, E. J., et al. 2011. The financial cost of doctors emigrating from Sub-Saharan Africa: Human capital analysis. *British Medical Journal* 343: d7031.
- Mmbando, E. 2009. Uniting Tanzanian medical students to reverse the brain drain. *Speaking of Medicine*. <http://speakingofmedicine.plos.org/2009/09/28/uniting-tanzanian-medical-students-to-reverse-the-brain-drain/> [accessed June 17, 2010].
- Muula, A. S. 2005. Is there any solution to the "brain drain" of health professionals and knowledge from Africa? *Croatian Medical Journal* 46 (1): 21–29. <http://www.ncbi.nlm.nih.gov/pubmed/15726672> [accessed September 8, 2012].
- Myburgh, A. 2002. Globalisation, labour mobility, and the economics of emigration: The case of South Africa. *Trade and industrial policy strategies*. <http://www.queensu.ca/samp/migrationresources/braindrain/documents/myburgh.pdf>.
- OECD (Organisation for Economic Co-operation and Development). 2002. *International migration of physicians and nurses: Causes, consequences, and health policy implications*. Paris.
- Padarath, A., and C. Chamberlain. 2003. Health personnel in Southern Africa: Confronting maldistribution and brain drain. *EQUINET Discussion Paper Number 3*. http://www.medact.org/content/health/documents/brain_drain/Padarath%20et%20al.%20-%20Medact-HST-Equinet.pdf. [accessed September 8, 2012].
- Pang, T., M. A. Lansang, and A. Haine. 2002. Brain drain and health professionals. *British Medical Journal* 324: 499–500.
- Pillay, R. 2007. A conceptual framework for the strategic analysis and management of the brain drain of African health care professionals. *African Journal of Business Management* 1 (2): 26–33. <http://www.academicjournals.org/AJBM/PDF/Pdf2007/May/Pillay.pdf> [accessed July 11, 2010].
- Sanders, D., D. Dovlo, W. Meeus, and U. Leemann. 2003. Public health in Africa. In R. Beaglehole, ed., *Global public health: A new era*. New York: Oxford University Press.
- Shah, A. 2006. Brain drain of workers from poor to rich countries. *Global Issues*, April 24. <http://www.globalissues.org/article/599/brain-drain-of-workers-from-poor-to-rich-countries> [accessed July 23, 2010].
- Shinn, D. H. 2008. African migration and the brain drain. Paper presented at the Institute for African Studies and Slovenia Global Action, Ljubljana, Slovenia, June 20.
- Stern, M., and G. Szalontai. 2006. Immigration policy in South Africa: Does it make economic sense? *Development Southern Africa* 23 (1): 123–145.
- Sullivan, N. 2011. Mediating abundance and scarcity: Implementing an HIV/AIDS-targeted project within a government hospital in Tanzania. *Medical Anthropology* 30 (2): 202–221.

- United Nations. 2010. Health workers, international migration, and development. *Population Facts-2010/2/E*. Department of Economic and Social Affairs
http://www.un.org/esa/population/publications/popfacts/popfacts_2010-2.pdf [accessed July 20, 2010].
- United States Department of State. 2012. Diversity Visa Program, 2007–2013, Number of entries received during each online registration period by country of chargeability.
http://travel.state.gov/pdf/DV_Applicant_Entries_by_Country_2007-2013.pdf [accessed April 10, 2012].
- World Bank. 1988. *Parastatals in Tanzania: Towards a reform program*. Washington, DC.
<http://documents.worldbank.org/curated/en/1988/07/738993/parastatals-tanzania-towards-reform-program> [accessed April 10, 2012].
- . 1991. *Tanzania economic report: Towards sustainable development in the 1990s*. Washington, DC.
<http://documents.worldbank.org/curated/en/1991/06/736164/tanzania-economic-report-towards-sustainable-development-1990s-vol-1-2-main-report> [accessed April 10, 2012].
- . 2011. Health systems: Statistical data. Washington, DC.
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/EXTHSD/0,,contentMDK:20190585~menuPK:2389336~pagePK:210058~piPK:210062~theSitePK:376793,00.html> [accessed April 10, 2012].
- WHO (World Health Organization). 2006a. Doctor-patient in Africa. *World Health Statistics*.
<http://www.who.int/whosis/whostat2006/en/index.html> [accessed September 9, 2012].
- . 2006b. *World health report 2006: Working together for health*. Geneva.
<http://www.who.int/whr/2006/en/>
- Zoghbi, W. A., et al. 2004. Working group 4: International medical graduates and the cardiology workforce. *Journal of the American College of Cardiology* 44 [2]: 245–251.
<http://content.onlinejacc.org/cgi/content/full/44/2/245> [accessed June 23, 2010].