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# A conceptual framework for the strategic analysis and management of the brain drain of African health care professionals

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This paper presents a conceptual framework for the analysis and management of the brain drain of African health professionals. It is a synthesis of information drawn from an exploratory study of the literature on the international migration of skilled workers. It outlines the causes of this phenomenon as well as the impact on, and interrelationships between, health systems, knowledge production and the economy at large. The paper concludes by outlining an integrated policy intervention strategy aimed at the different variables in the framework.

**Key words:** Brain drain, health professionals, Africa, conceptual framework.

## INTRODUCTION

One of the key prerequisites for international peace and prosperity today, is the ability of developing countries to participate fully in the global economy. Economic globalization and the integration of markets, coupled with the liberalization of the trade in services, need to be managed responsibly at national, continental and global levels if it is expected to enhance social development and ensure human well-being for all throughout the world (Nagarajan, 2006).

The advent of globalised markets and companies, coupled with the expansion of knowledge and service-oriented economy has resulted in a growing demand for skilled personnel. This has resulted in an increase in the international mobility of skilled labour which is a natural response to this increasing interconnection and inter-dependency between our societies and economies. Fundamentally, there is no problem with this phenomenon, but when

skilled intellectuals and technical labour are lost and cannot be readily replaced, this can pose complex challenges and have adverse implications for a source country, especially if these are developing countries - a brain drain.

The global health labour market is similar to that of other skilled professionals and since global demand far exceeds supply, the flow of health professionals across borders is high. The out-migration of Africa's health professionals, facilitated by the portability of their qualifications and skills and high demand in developed countries, is posing a serious challenge to health systems throughout the continent. The loss of medical professionals, coupled with the maldistribution of those that remain, a lack of resources, and the burdens of poverty and infectious diseases are causing health, social and economic systems on the continent to disintegrate. The ensuing crisis requires an urgent collective, continental approach if we are to successfully grapple with the challenges facing us.

Coping with the issue of skilled migration is a challenge that faces policy-makers, business leaders and academics alike, because of the major consequences for socio-economic development that a net outflow of skilled labour has. This paper proposes a framework that can be utilized to systematically analyze the causes and consequences of the brain drain of health professionals, as well as providing points of leverage for policy interventions.

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Abbreviations: CSIR Centre for Scientific and Industrial Research; GDP Gross Domestic Product; G8 Group of Eight; HST Health Systems Trust; IOM International Organization for Migration; NEPAD New Partnership for Africa's Development; OECD Organisation for Economic Co-operation and Development; PHR Physicians for Human Rights; SA South Africa; USA United States of America; USAID United States Agency for International Development; UNECA United Nations Economic Commission for Africa; UK United Kingdom.

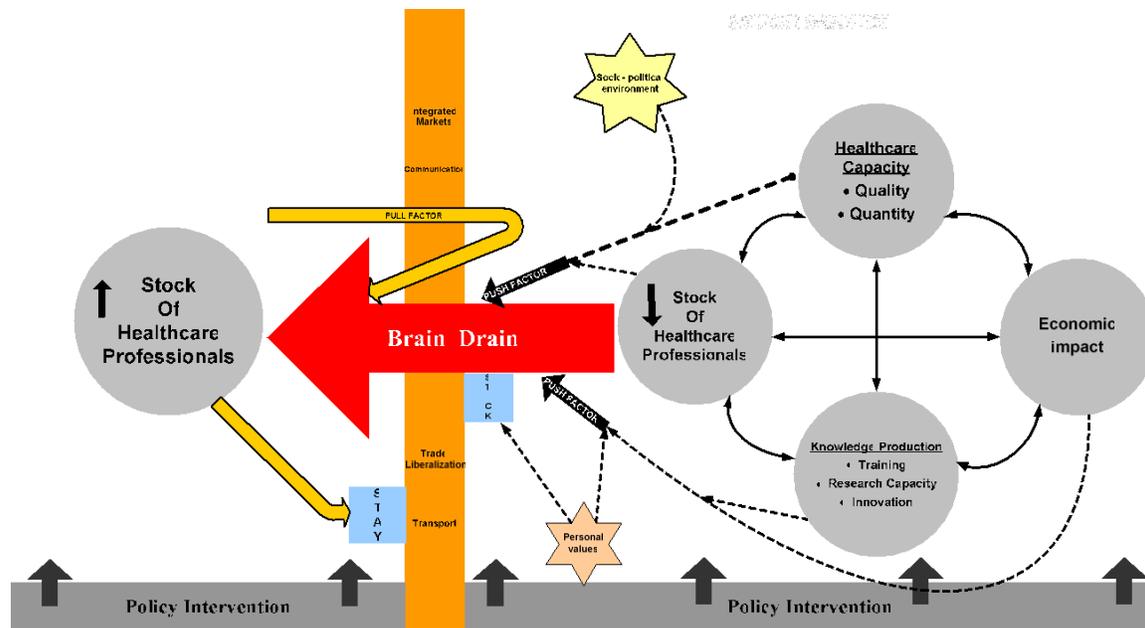


Figure 1. Conceptual framework for the analysis and management of the brain drain of African health professionals.

## METHODOLOGY

This paper provides an overview of existing information on the out-migration of health professionals from Africa. The methodology entailed a comprehensive review of key research, data and policy issues aimed at analyzing the relationships between the key drivers of the brain drain, as well as the consequences thereof, on the African continent

### Scope of the brain drain of African health professionals

The principle axes for the flow of African health professionals are to countries that have previously colonized them. Migrants from Anglo-phone countries migrate to the United Kingdom and other English-speaking countries while their Francophone counterparts usually migrate to France and some parts of Canada. Although these losses are difficult to quantify because of the lack of reliable data, the information available points to a critical situation. It is estimated that 23000 health care professionals emigrate from Africa annually (South African Institute of International Affairs, 2005).

The USA, UK and Canada are the most common destinations for African trained doctors with 5334, 3451 and 2151 respectively, registered to practice there (Hagopian, 2003). Between 1993 and 2002, Ghana lost 630 medical doctors with 50% of medical school graduates emigrating within 4.5 years and 75% within 9.5 years (IOM, 2005). More than two thirds of the 1200 doctors trained in the 1990's in Zimbabwe were lost to that country while Ethiopia and Zambia have lost 50% of their doctors. Zambia has retained only 50 of the 600 doctors trained there from 1978 to 1999 (Frommel, 2002 in Stalker 2001; Bundred and Levitt, 2000). It is also estimated that Nigeria lost a staggering 21000 doctors to the USA, all of whom are not registered as practicing physicians in the USA (UNECA, 2000 in Meeus 2003). Of the 19 500 graduates produced in SA medical schools between 1990 and 2005, the number of registered doctors rose by only 9304, suggesting that a large proportion of SA medical graduates fail to register to practice in SA at all (Financial Mail, 2006). 10% of Canada's hospital doctors are South African and 600

SA doctors are currently practicing in New Zealand. It is estimated that 6% of the UK's health professionals are South African, and in total there are approximately 23 407 SA medical professionals working in the UK, USA, Canada, New Zealand and Australia (OECD, 2003). There are also more doctors from Guinea Bissau, Sao Tomé and Cap Verdé working in Portugal, than there are in their home country (Stilwell, 2004).

The situation is similar for nurses with Britain being the major destination for African nurses, although the USA, Saudi Arabia and other Gulf states are showing an upward trend. It is conservatively estimated that 9000 South African nurses are working abroad (OECD, 2003). Ghana has only half the number of nurses it had in the mid-1980s and annually they lose the equivalent number of nurses that they produce (Ministry of Health, Ghana, 2000). Zimbabwe lost 18000 nurses to the UK in 2000/2001 and currently loses about 300 per annum (Dube, 2001 in Stalker 2001). The trend is similar for Nigeria, Zambia, Malawi and Kenya (PHR, 2004)

Although most of the data available pertains to doctors and nurses, it is very likely that other health professionals are faced with similar crises. In addition, although health personnel from South Africa and Nigeria constitute the majority who leave, smaller numbers lost from other African countries may have a disproportionately larger impact because of lower stocks and flows of health personnel into the system, weaker health systems and higher attrition rates of health professionals.

## THE CONCEPTUAL FRAMEWORK

The framework illustrated in Figure 1, above, highlights the multiple forces at play that result in the net out migration of health professionals from source to recipient countries, as well as its impact on the various sectors, either directly or indirectly. It suggests that optimal management of this phenomenon depends on the adoption of appropriate and cohesive policies in both source and recipient countries as well as across sectors.

## **Factors driving the out-migration of African health professionals**

The mobility of health professionals depends on personal values as well as on the interplay of complex social, political and economic forces that emanate both in source and in recipient countries. The net outflow of health professionals from the African continent results from a net force that favours recipient countries. These forces, (termed push, pull, stick and stay), originate either within or outside the respective health systems. In addition, there are other important facilitating factors that create an enabling environment for migration.

Push forces originate in source countries while pull forces originate in recipient countries. These forces interact with each other and most of these factors are the converse of the other (e.g. low pay in the source country compared to higher pay in the recipient country) (Briggs, 2000). Important economic push-pull forces that result in outward migration are related to labour market conditions, such as employment rates and demand (Bach, 2003), wage differentials and benefits (Hamilton and Yau, 2004; Dovlo, 1999), work context issues such as organisational capacity, workload and work associated risks, and career development opportunities (Sanders et al, 2003; Meeus 2003). Non-economic forces that drive outward migration include perceived quality of life, political stability and crime levels, educational opportunities for children and the presence of a network of fellow citizens in the host country (OECD, 2002). Data from SA clearly illustrate major peaks in emigration after significant political events (Myburgh, 2002).

Despite the presence of the forces described above, some health workers remain in their home countries. This could be due to strong socio-cultural and patriotic values, the presence of rewards and incentives or the prohibitively high costs of migration. Padarath, et al (2003) term these stick factors. Similarly, those who have migrated may choose not to return because of the development of new socio-cultural bonds and the potential to disrupt their families and their lifestyles – stay factors.

Ultimately, the decision whether the health professional leaves Africa, stays, or decides to return or not, depends on the interplay of these four forces. In addition, facilitating factors that create an enabling environment to migrate include easier communication and access to information, improvements in transportation, the liberalization of trade in services and the formation of integrated economic markets.

## **The stock of Africa health professionals**

It is generally acknowledged that health professionals are a critical component for the effective performance of health systems and without skilled human resources health care systems cannot function adequately. Countries on the African continent report major shortages of health

professionals relative to those in Europe and North America with a recent estimate suggesting that sub-Saharan Africa is approximately 700 000 doctors and 700 000 nurses short of the staffing requirements necessary to meet the Millenium Development Goals (Buchan and Calman, 2005). Africa also averages only 1.4 skilled health professionals per 1000 population in comparison to Europe's 10.3, a seven fold increase with 38 countries in Africa not meeting the "Health for All" standard of a minimum of one doctor per 5000 people by the year 2000 (Stilwell, 2004).

The situation is continuously deteriorating and Sub-Saharan Africa is the only world region to show declines or stagnation in the ratio of doctors to population between 1970 and 1997 (Dovlo and Martineau, 2004; Sanders et al., 2003). In addition, there are inequities in health personnel within African countries. The main disparities of the internal distribution of staff occur between the public and private sectors, between urban and rural areas or between tertiary and primary levels of the health system. This means that for large numbers of people, the availability of health personnel is even worse than what country-level indicators suggest (WHO, 2003).

Although these imbalances are significant and continue to grow, it cannot be solely attributable to out-migration. In most of the African countries the numbers of vacancies far exceed the number of professionals who have emigrated and are working abroad.

## **The impact of the brain drain of health professionals on Africa**

One of the greatest obstacles to Africa's development is the emigration of its skilled workforce and the consequent loss of the factors of production, namely labour, capital and enterprise. The loss of health professionals hampers the continent's ability to deliver health services and reduces its capacity to train, research and innovate in this sector, which impacts adversely on socio-economic development, either directly or indirectly.

### **Impact on health service delivery**

It is the prerogative of every government to ensure that its citizens have access to affordable and appropriate health care. However health systems in Africa face a variety of health personnel problems which include overall lack of personnel in key areas of the health sector, an inequitable distribution of those who are available, and a significant attrition of trained personnel from the health sector. The availability of health personnel in Africa is considerably worse than in other regions of the world as revealed in Figure 2, and it is one of the stumbling blocks to the delivery of adequate healthcare (Stilwell, 2004). Recent studies reveal a significant negative correlation between health worker density and mortality rates (World Bank, 2001), and a positive correlation between quality of

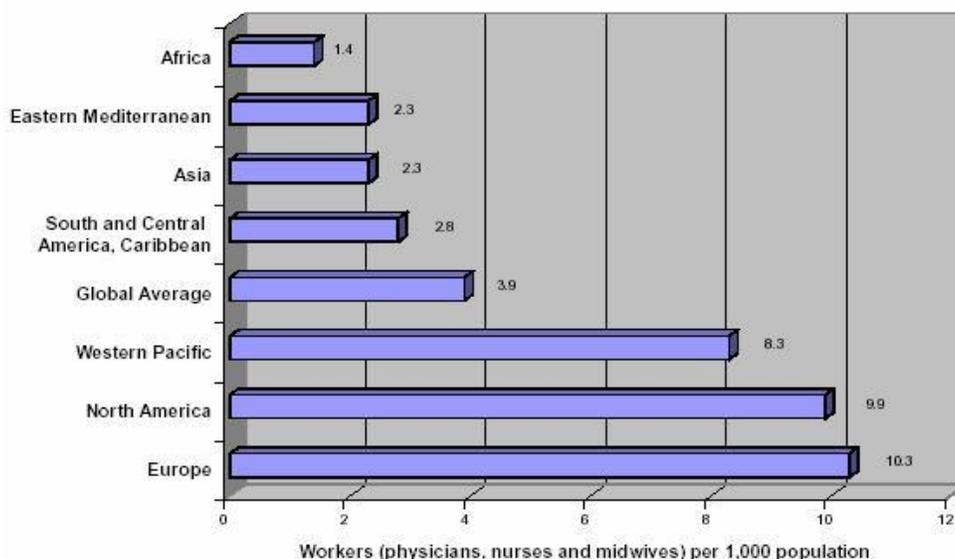


Figure 2. Worker densities by region (WHO, 2003).

care and healthcare outcomes, and the availability of health personnel (Mercer and Dal Poz, 2002).

As the number of trained health personnel drops, the ability of systems to deliver the requisite health services is reduced, both in terms of quality and quantity. The South African public sector is missing a third of the doctors it needs (Financial Mail, 2006), Mali had to close 57% of community health posts due to lack of personnel (USAID, 2003), and in Zambia and Malawi the growth in the number of health facilities has outstripped the health system's ability to staff them (Dovlo and Martineau, 2004). Ultimately it is the poorer rural populace that suffers the brunt of any reduction in health personnel, as these are the least preferred areas to work in.

Staff shortages in health facilities increase the workload demands on those who remain, limit the number of people able to receive care, and diminish the quality of care for those able to receive it. Waiting times are long and often facilities are staffed with unqualified personnel. Even patients seen by qualified personnel are put at risk due to time constraints and provider fatigue (Padarath et al., 2003).

However, the negative impact on health care is not only as a result of the loss of a large number of personnel. The loss of a few highly specialized individuals that are scarce can lead to the complete collapse of a particular service within a country (Padarath et al., 2003). In addition when more experienced personnel leave there is a consequent loss of institutional memory which results in the duplication of work and wastage of resources as a result of reinventing disease management strategies and an inability to refine strategies based on experience, all of which are often not captured as part of the costs and effects.

At a national level, health personnel shortages can also prevent a country from implementing strategies to achieve certain health goals such as Aids and tuberculosis targets (Chen and Boufford, 2005), immunization coverage targets (Brown, 2003) or achieving the health Millennium Development Goals (Chen, 2004).

### Impact on knowledge production

The impact of the brain drain on associated areas of the health labour market such as training, research and innovation are also crucial. Whilst their relative numbers per se may be small, the consequences of their loss are far more significant. The loss of academic and experienced personnel weakens the capacity of research and health services by impacting on the future production of health personnel in terms of numbers and quality, as well as on the mentoring of the remaining practitioners.

Data on the academic workforce in SA indicate a slow growth amongst permanent academics, an increase in the proportion of academics aged 55 and above, and a decline in the percentage of academics with doctorates at universities (CSIR, 2005). Similarly, in Ghana (Martineau et al., 2002) and in Malawi (Muula, et al., 2002) there has been a drastic reduction of academic health professionals and nursing tutors respectively, which has hampered these countries ability to train new health professionals. This could possibly be attributed to emigration.

Similarly, data on the research and development workforce in South Africa also shows a significant decline at both higher educational institutions as well as in government employ. The total number of medical researchers in the South African public sector declined from 189 in 2002 to 136 in 2003 (HST, 2004). Placed in an international

context, most African countries also have far fewer researchers for every thousand members of the work-force compared with more developed nations (CSIR, 2005). Given that technology and innovation are underpinned by a sound academic workforce, these demographics represent a critical state of affairs and suggest that the main challenge relates to promoting the retention of academics.

Long-term analysis of South African scientific output shows that overall, total outputs as well as those in ISI publications have been stagnating for the past 10-15 years. However, in terms of world output this has meant a decline in proportion of world share from 0.7% in 1987 to 0.49% in 2000. Cumulatively Africa's share of global scientific output has fallen from 0.5% in the mid 1980's to 0.3% in the mid 1990's. Further analysis shows that the situation is worse for the medical and health sciences with a decline in output from 22 to 20% over this period (CSIR, 2005). Demographics also point to an alarming trend that an increasing number of scientific articles are published by SA scholars over the age of 50 years. If one adds to this consideration the fact that the more productive scientists in any system are also generally older, then the significance of our aging profiles becomes even more pertinent.

When researchers leave, they also weaken the educational system as many of the best minds take this option. This leads to deficiencies within training institutions and the professional attachment and supervision of new graduates, thereby also affecting the future education and training of health personnel. The loss of research capacity at institutions is also evidenced by the high incidence of dropouts and the increase in the time-to-completion for graduates. One SA study (CSIR, 2005), showed that the number of non-completions of master's students increased by 45% from 1968 in 1991 to 2859 in 1999.

The reduction in supply of health professionals further weakens the absorptive capacity of new research and medical techniques by the domestic market and this too, can reduce the quality of local research and training. It discourages local demand from sourcing knowledge and services locally, thus further weakening the health system and its financial base. The more sophisticated demand sectors then turn to those outside the domestic system for their supply, thus further weakening the financing and demand for similar qualities of treatment at home. This creates a further disincentive for research on local diseases and a focus on northern hemisphere health problems where funds and facilities are more readily available. The prospect of migration may also drive the orientation of the curriculum more towards the export market than to the epidemiologic challenges at home.

### **Effects on the economy**

Human capital is the backbone of productivity and the foundation upon which economies grow. A brain drain of

health professionals depletes a nation of its skilled workforce, thus slowing economic growth and consequently impacting adversely on the quality of life of its citizens. The effects are numerous and varied.

The first relates to loss of the investment in the training and subsequent non-use of skills of the health professionals. Governments invest in medical education to strengthen their national health capacity and emigration drains these investments away from the health needs of the national population. The cost to source countries is significant in terms of the investment required to replace lost health personnel. It is estimated to cost between \$60 000 and \$97 000 to train a general practitioner in Africa, and approximately \$42 000 for a nurse (Dumont and Meyer, 2004). Recipient countries on the other hand save approximately \$500million annually in training costs through the acquisition of foreign professional (Meeus and Sanders, 2003; Martineau et al., 2002). The loss of south African doctors between 1989 and 1997 translate into a loss of training investments of \$5 billion while the South African doctors in New Zealand have cost tax payers R600million (Bundred and Levitt, 2000). For countries losing fewer personnel, the total loss may be lower, but relative to annual public budgets, these losses are substantial. At the same time, the prospect of emigration may attract students to medical education who have from the start the intention to emigrate, rather than the commitment to serve domestic needs. This has the effect of shifting the government subsidy from being an investment in health to being a privatised benefit to one person.

Secondly, the contributions such professionals can make to the GDP of their home country are lost. Migration to the industrialized countries thus presents a serious case of reverse subsidy of industrialized countries training costs.

Thirdly, in the light of the dwindling professional sector, African institutions are increasingly dependant on foreign expatriates. Africa currently employs up to 150 000 expatriates at a cost of approximately \$4 billion per year. Several African countries are dependant on Cuban and Eastern European health professionals to provide care, especially in rural areas. In 1999, 6% (6000) of South African registered doctors were foreign.

Fourthly, lost worker productivity associated with worsened health contributes to further economic loss. Inadequate healthcare makes a country's workforce less efficient and people are absent from work because of health problems, or problems encountered in accessing care (Commission on Macroeconomics and Health, 2001).

Other impacts on the National economy may be regarded as positive. Migrants often remit a portion of their earnings back home and thus contribute to economy growth and poverty alleviation. Whilst this is acknowledged and encouraged in countries such as India and Philippines, this is less organized and managed in African countries. Recorded transfers to Africa amounted to \$12-billion in 2002. It is estimated that the third largest inflow

of funds to Ghana is from remittances by Ghanaians abroad (Shinn, 2002). The global surge in remittances stands in stark contrast to slower growth in overseas aid and provides a compelling argument for migration playing an important role in international development and being a powerful force for poverty reduction. However, some evidence suggests that remittances by health professionals (unlike other migrants) are limited and do not necessarily offset the lost investment in their education. (Commonwealth Secretariat, 2003; the Economist, 2002; Stalker, 2001).

There is also the possibility that immigration of skilled workers promotes a higher investment in human capital in countries of origin. The possibility of emigrating to high-wage countries may stimulate persons to pursue higher education in anticipation of pursuing higher paying work abroad. As the incentives to pursue education in the source country are enhanced average human capital is increased which contributes to stimulating overall growth (Beine et al., 2001, 2003)

Brain circulation – the return of professionals with enhanced skills or the mobilization of the skilled Diaspora via virtual networks- is also often cited as an economic benefit (Martineau et al., 2002). However, this benefit of technology and knowledge transfer can only accrue if returnees have access to similar resources and working conditions.

### **Policy interventions and implications**

Any rational attempts to manage the causes and consequences of medical migration will require an integrated policy framework that preserves the human right to free choice and free movement. The forces that drive this phenomenon are complex and originate both in source and destination countries. The challenge for source countries is to manage the outflow of health personnel in a sustainable way and decrease the impact of emigration on the continent while that of destination countries is to manage their demand in a responsible way without compromising source countries. The suggested policy interventions are by no means detailed or prescriptive but merely serve to highlight principles to guide policymaking within the context of the conceptual framework in Figure 1.

### **Addressing ‘push – pull’ gradients**

One of the most sustainable ways to decrease the emigration of health professionals is to address the push factors. Factors within and beyond the purview of health systems, need to be addressed as part of a comprehensive response to the brain drain of health professionals. This could be done by improving conditions on the continent, increasing economic growth and the absorption of health professionals into the economy.

Factors endogenous to health systems such as management capacity, health care infrastructure, remuneration, working conditions and professional development opportunities need to be addressed. Exogenous factors such as crime and issues of governance are also vital.

Pull factors can be reduced if developed countries manage their demand by implementing strategies aimed at self sufficiency or by engaging in managed migration which entails bilateral agreements with countries which have a surplus of health professionals (Bach, 2003).

### **Strategies to deal with reduced stock of health care professionals**

Countries on the African continent need to consider more innovative strategies to improve their stock of health professionals because of resource constraints and the inevitability of migration. Simply increasing the production of health professionals does not mitigate the loss – more leave. In SA, less than 50% of doctors produced in the 15 years up to 2005 registered (Financial Mail, 2006), while in Zimbabwe less than 5% produced from 1995 to 1998 registered to practice (Chikanda, 2000). However consideration should be given to training more non-tradable health workers, bonding new graduates and improving retention strategies, and improving the utility of existing staff by skills enrichment and cadre substitution (Dovlo and Martineau, 2004). In addition, encouraging immigration of health professionals by synchronizing labour and immigration laws, and by harnessing the skills of the Diaspora, can overcome some of the insidious effects of the brain drain.

Destination countries can contribute to improving staffing levels in source countries by discouraging emigration from at risk countries, by using ethical and transparent recruitment strategies, setting quotas or caps on immigrant health workers, increasing temporary work permits to encourage short term migration, and establishing professional certification for foreign trained medical personnel which may be a barrier in terms of cost and effort.

### **Improving health care capacity**

Source countries need to improve quality and quantity of services by improving utilisation of skills/ mix of other staff, unfreezing of posts aimed at reducing public expenditure and improving overall efficiency, effectiveness, governance and equity of the health system.

### **Knowledge production**

Focusing on improving our training, research, and innovation capacity is premised on the causal link between these key enablers and the growth of human capital, technical progress and improved business performance. Consequently there is economic growth, wealth creation

and social upliftment. Policy options aimed at enhancing these variables therefore has the potential to result in a virtuous cycle with skills retention and attraction the end result.

Current knowledge generation capacity can be strengthened by creating bodies that make the health innovation function coherent, improving public sector investment, creating centers of excellence, leveraging ideas, capital and technology from the skilled Diaspora and fostering networks and linkages with the global scientific community. Enhancing future knowledge generation capacity can be ensured by improving proficiency and encouraging excellence in mathematics and science among scholars by improving capacity at schools and higher education institutions.

### Mitigating the economic impact of the brain drain

All of the strategies above are crucial and need to be implemented in concert if we are to avert the socio-economic impact of the brain drain of health professionals. However, at a more direct level, source countries can negotiate compensation from destination countries and facilitate remittance flows and investment from Diaspora. Destination countries can consider increase in debt relief/health aid and compensation for educational costs as well as tax relief for funds repatriated to home countries.

### Global governance

The international mobility of skilled workers is a reality of the 21<sup>st</sup> century. However, because of the impact of a brain drain in developing countries and especially in sectors such as health care, it is imperative that the global governance of migration should become part of the global policy agenda, similar to environmental and information management issues (Newland, 2005). African organisations such as the African Union and NEPAD, recipient country organisations such as the G8 and OECD as well as key custodians of the global economy such as the International Labour Office and the World Health Organisation need to set the agenda to achieve equitable health care for all.

### Conclusion

It is clear that the issues of migration of health professionals and the brain drain in general are complex and that the impact on the continent is pernicious. The challenge for Africa and for the developed world is to manage the needs of local health systems with that of global demand without compromising the right of individuals to free choice and movement. African countries need to ensure socio-political stability, facilitate economic growth and skilled labour absorption into the economy thereby creating an enabling environment to deliver care and en-

couage professional development. In this way inter-regional differences are eliminated and the context to stay home and contribute to the local health care systems is created

Improvements and innovation in the health sector impact directly on the quality of life and given the strategic value of medical and health research in a continent where the burden of disease continues to have widespread economic and social effects, it is imperative that capacity in this sector is enhanced. Unless these challenges are heeded, we will continue to lose crucial skills with no real prospect of becoming a significant player in the global knowledge economy. It is hoped that the framework presented can contribute to measuring and managing the migration of health professionals.

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