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'Turning the Ebbing Tide': Knowledge Flows and Health in Low-income Countries

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In many developing countries, the value of knowledge is in its capacity to save and enhance human lives. The absence, loss or restriction of such knowledge impacts at the lowest levels of disadvantage and poverty, in death and disease. Essential components of an effective health service are medicines and skilled human resources. This paper highlights the restricted availability of these resources — a situation that arises because of deliberate policies that adversely affect knowledge flows towards the poor. We focus in particular on intellectual property rights and the mobility of highly educated health professionals (the 'brain drain') and how the ensuing knowledge flows affect health systems and their ability to respond to the often worsening health situation in many countries, particularly in the context of HIV/AIDS. We conclude that urgent steps need to be taken to address the facilitators of human resource outflows and the inhibitors of intellectual capital inflows in sub-Saharan Africa.
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Labonte (2004) suggests that health can be presented in three ways: as a prerequisite to economic development, as a matter of global security and as a fundamental human right. This paper is motivated by, in particular, this third argument, where health is considered as a human right in the same way as many people now view education as a human right. This does not of course mean that everybody must be equally healthy, but rather, that they should have a right of access to appropriate health care, especially when their poor health is associated with social or economic disadvantage (equal treatment for equal need). However, whether an investment in health is motivated by economic, security or human rights concerns, a knowledge base is an essential prerequisite to such investment. The conceptual base of this paper is to consider two key elements of such a knowledge base — human resources and intellectual

property rights — in terms of *global forces*. We argue that globally there is insufficient support for knowledge inflows to countries with poor health indicators, and that deliberate incentives encourage knowledge outflows from such countries. Furthermore, this state of affairs is not coincidental; it is engineered through policies that strongly influence international knowledge flows.

While the literature on knowledge management has a very important role to play in enhancing the efficiency and efficacy of knowledge to achieve pro-social ends, here we emphasize international (or 'macro') knowledge flows. The example of international monetary flows and industry or sector economies is somewhat analogous: the mechanisms for financial management within an industry are distinct from, yet not unrelated to, international factors. Local fiscal practices may indeed exert pull or push factors on international economic resources; however, the foreign policy of OECD countries, World Bank policy, International Monetary Fund practices, as well as the operations of multinationals, often exert a distinct, and sometimes stronger, influence. Our concern in this paper is with how these latter international (or 'macro') issues affect the flow of knowledge with regard to alleviating the health of the poor.

Human Resources: The 'Brain Drain'

The World Health Organization (WHO) Statistical Information Service indicates that 10 out of the 45 African countries have physician to population ratios of less than 5:100,000, with the average in sub-Saharan Africa being just 17.1 doctors and 89.7 nurses per 100,000, compared with an average of 303.7 doctors and 723.6 nurses per 100,000 in industrialized countries. African countries have, on average, 17 times fewer doctors and eight times fewer nurses than industrialized countries (Liese *et al.*, 2003).

Liese *et al.* (2003) argue that the proportion of health personnel to population has stagnated or declined in nearly every African country, since 1960. According to Kalanda *et al.* (2004, 23) 'In most developing countries which are affected by HIV and AIDS, lack of human resources is arguably the most limiting factor in providing ART [antiretroviral therapy] and running health systems in general'. Human resources are at the core of any effective health system — the delivery of care is managed through them. In sub-Saharan Africa, the reduction in health workers, at a time of increasing health demands, is now reaching crisis point and undermining potential advances in other aspects of health care such as antiretroviral (ARV) roll-out for HIV/AIDS. Ntuli (2004) of the Health Systems Trust, South Africa, has argued that there is

'an urgent need to reverse the human resource drain from health systems, and especially public health systems, in Southern Africa' (p. 4).

As a measure of its concern, the African Union declared 2004 the 'Year for Development of Human Resources with Special Focus on Health Workers'. While at first sight this might appear a very narrow focus for a continent with such vast and diverse challenges, it is testimony to the recognition of health workers as a conduit, not only to health but also to development generally. In the health sector, doctors, nurses and the myriad of other health workers are the very embodiment of knowledge flows; they are charged with the responsibility of applying years of knowledge accumulation to the ultimate beneficiaries of that knowledge — people with health problems.

The exodus of health workers from developing countries continues to maintain and increase the dependence of those countries on more developed nations, the nations to which health personnel migrate. The recruitment of the best-qualified health personnel from developing countries, at no training cost to the recipient countries, is increasingly being recognized as unethical. Almost 50% of doctors trained to work in Africa leave to work abroad (EQUINET, 2004). With an estimated cost of USD60,000 for training a general medical practitioner in the Southern African Development Cooperation (SADC) region, outflows from the region to more 'developed' countries amount to a $500 million reverse subsidy per annum (EQUINET, 2004). UNCTAD has estimated that the United States has saved USD3.86 billion as a consequence of importing 21,000 doctors from Nigeria alone. Furthermore, over the next 10 years, the United States will require an additional one million nurses to meet the shortfall from its own training programmes (EQUINET, 2004). It is estimated that across the United States, United Kingdom, Canada and Australia, over a quarter of medical and nursing staff are foreign trained (Organisation for Economic Cooperation & Development, 2002). Some justify this resource drain by highlighting the repatriation of salaries to the country of origin and the importance of these funds to their dependants in low-income countries. However, providing adequate remuneration in their own country would allow health professionals to provide for their families without the necessity of physical separation from them for long periods of time.

In addition to international migration, there is also considerable in-country migration between the public and private health sectors, between urban and rural areas, and between tertiary and primary health-care delivery. Increasing flows of health workers into private, urban, tertiary facilities are undermining attempts to provide appropriate public, rural, primary care. For instance, in Chad's capital region of N'Djamena, Wyss *et al.* (2002) found 71 doctors per 100,000 people, while in the Charai-Baguirmi region, the ratio was only two doctors per 100,000.

Context of HIV/AIDS

An estimated 15 million people in sub-Saharan Africa are currently infected with HIV, of which somewhere between 750,000 to one million have AIDS. Only one eligible person in 25,000 is presently receiving ART (EQUINET, 2004). While the provision of ART services represents a significant investment in health for sub-Saharan countries, there is a danger that 'projectization' could lead to staff leaving other areas of the health service to participate in better-resourced ART programmes. In short, ART scale-up should be used as an opportunity, a springboard, for the general strengthening of health services, rather than being allowed to become a stimulus for the collapse of already weak, but vital, primary-care services within the health service. However, the tensions between improving primary-care services and scaling up ART delivery are all too evident and Liese *et al*. (2003) conclude that, regarding ART, 'the limited availability of human resources in Africa is likely to *singularly determine the pace of scaling-up services* and to limit the capacity to absorb additional financial resources' (p. 14, italics added).

Motivation and Retention

The World Bank (2004) reports the case of Joytsna Neopane, an anesthesiologist from Nepal, living in New York City. Having just completed her medical residency, she expects to make USD225,000–250,000 a year once she is hired. 'Compare that with less than $100 a month I used to make at a government hospital in Kathmandu, and you have the answer to why thousands of doctors from the Indian Subcontinent end up here', she says (p. 111). And the same is true for many other medically qualified, and other health professionals, from developing countries.

Low wages for health personnel in sub-Saharan Africa may discourage entry into health professions, encourage exiting from them, encourage migration to more affluent job markets or encourage absenteeism, so increasing the workload on remaining personnel and diminishing their motivation. Low compensation in rural areas and higher pay in the private sector may be other factors that lessen the attraction of public sector health work (World Bank, 2004). Again, knowledge flows away from the poor.

The first step in addressing the significant outflow of personnel from developing countries is to retain those who are already there. A recent paper from Chaudhury and Hammer (2003) reported the results of unannounced visits to health clinics in Bangladesh that sought to ascertain the proportion of medical practitioners who were present at their assigned post. Nationwide, they found a 26% absentee rate in rural health centres, with considerable regional

variation. In the poorer areas, with single doctor clinics, this rose to 74% absenteeism. Thus, even when health facilities are staffed, the staff may not be present.

While absenteeism is one consequence of demotivation, other, perhaps more insidious elements, are also apparent. For instance, a World Bank (2003) study reported that a lack of 'application' among health service staff reduces the technical quality and weakens the patient's confidence in the health-care system. Concentrating on five West African countries, it reported impoliteness, lack of attention to patient's needs, physical and verbal violence, corruption and nepotism, along with informal fees, as causes for the poor reputation of public health services. In Tanzania, time and motion studies found overall productivity in public health facilities to be only 57%, with a mere 37% of staff time spent on patient care (Kurowski *et al*., 2003). Further, skills among health personnel are often inadequate, in terms of making accurate diagnoses and following through with appropriate treatment; not only skill level but also skill mix is poor, while application within the job is also problematic (McPake *et al*., 1999; World Bank, 2004). This seems to suggest that not only knowledge outflows but also the application and transfer of knowledge are the problem, something that could perhaps be addressed by internationally supported government investment in knowledge management through appropriate research and IT infrastructure.

Differential payments to equivalently qualified health personnel, which arise because some are 'nationals' while others are expatriates on 'international' salaries, may also produce demotivation, which affects work performance. Inter-group relationships may be influential where the promotion of some individuals over others may aggravate collective traditional identities and thwart an individual's initiative for high achievement (Carr *et al*., 1998; MacLachlan and Carr, 2005). In many contexts then, remuneration in the form of money does not simply have instrumental value, but also has symbolic meanings linked to people's relative worth and broader identity. Where there are feelings that remuneration is either relatively or absolutely unjust, then people may develop compensatory mechanisms, such as absenteeism or reduced productivity, to adjust for their felt loss of self-esteem.

There have, however, been some reversals in health worker outflows, notably in Zambia where nurses' wages were doubled, and in Thailand, which offered generous research funding and monetary incentives to encourage medical practitioners to return to Thailand. However, the World Bank (2004) recognizes that there are limits to what can be achieved through compensation alone, as raising salaries, even to purchasing-power parity with developed countries, 'is simply unfeasible'. Neither, they argue, is using compensating wage differentials to stop staff moving into the private sector a solution. However, a recent study in India has highlighted that while money is an

important motivational factor, it is not the only, or even the most important, factor in people's work performance. The World Bank's report (World Bank, 2004) states, 'what people can do in their jobs also matters' (p. 115). Although less than 40% of health workers in India's province of Andhra Pradesh felt that their jobs provided a good income, this was not what they most aspired to. Instead, training opportunities, challenging work, positive relations with colleagues, a desirable location (including proximity to a good school), and good physical working conditions were all seen as more important than pay, *in both the public and private sectors*. These findings suggest that a broader conceptualization of 'reward' for health workers is needed to improve the retention and motivation of staff vital for both the application and generation of knowledge.

According to the World Bank (World Bank, 2004) 'countries could gain from better understanding the expectations that health workers have of their jobs and the degree to which these expectations are met' (p. 115). For instance, in Thailand, it has been found that one of the reasons that professionals leave rural areas is that they feel their need for continuing education is not being met (Srinavichakron, 1998) — that knowledge is not flowing towards them. However, increased training also carries the risk of increasing the mobility of health workers by offering them access to international job markets. It is therefore important that such training should target in-country, and particular health priorities at the expense of perhaps more exportable knowledge and skills. This has been successfully achieved in Ethiopia where 36,000 families were selected for involvement in a health extension package (HEP). Selected families are trained as health extension workers to educate other families on a wide variety of health matters from family planning, maternal and child health to malaria and HIV/AIDS. In total, 96 hours of training is delivered over a 2- to 4-month period. Preliminary results have shown that the HEP families have better health conditions than non-HEP families (Ghebreyesus, 2004). This experience shows that it is possible to reduce redundant knowledge and tailor knowledge flows to local conditions and resources. This also raises the prospect of new cadres of health workers providing specific health-care services without tertiary-level training. There is very obviously a conflict between the desirability of global knowledge flows on the one hand, and the imperative that knowledge should not be dissipated in the most needy areas by empowering the mobility of personnel working in those areas.

Intellectual Property Rights and Medicines

Knowledge flows affect not only the supply of human resources to areas of the greatest health need but also the supply of essential medicines. The Human

Development Report (United Nations Development Program, 1999, 32) noted that worldwide patent applications had increased from 3,000 in 1977 to over 54,000 in 1997, with industrialized countries owning 97% of these. Furthermore, over 80% of patents granted in developing countries are actually owned by residents in industrialized countries.

Godrej (2003) reports that in early 2003 a group of South Korean leukaemia patients, who had taken part in drug trials for Novartis's new life-prolonging drug, Glivec, found that the drug was being marketed at $50,000 for 1 year's treatment. These patients tried to undermine the drug producer's patent by applying to the World Trade Organization (WTO) for 'compulsory licensing', a clause that allows governments to buy or produce a generic version of a drug where there is a 'national emergency' or 'extreme urgency'. Although the Koreans had identified a drug manufacturer in India who could produce the drug for less than USD1 per tablet (compared to the USD19 per tablet charged by Novartis), it seems that the United States and South Korean government concerns prevented them importing these (Godrej, 2003). Large pharmaceutical companies, unsurprisingly, wish to foster a global market that promotes stringent patent protection, without price regulation.

Hieronymi (2004) asks how the principles of the dynamic market economy (including competition, private initiative and ownership) can be reconciled with the 'search for the common good, with respect for fundamental ethical and moral standards, and last but not least with solidarity with the weaker members of the community' (p. ix). The WTO promotes trade liberalization and the lowering of trade barriers through the establishment of multilateral agreements. One of these is the TRIPS agreement (Agreement on Trade-Related Aspects of Intellectual Property Rights).

TRIPS is a key international instrument developed to help govern rights over knowledge. While such an instrument can be beneficial through stimulating investment and innovation, it is the balance between this and allowing wider public access to knowledge that the public may benefit from, which is problematic (Drahos and Mayne, 2002). Drahos and Mayne (2002) argue that TRIPS was 'pushed through by a handful of rich countries under the influence of a heavy corporate lobby without the informed participation of many developing countries' (p. x). The extended monopolies granted by TRIPS rules facilitate Northern-based companies to extend their control over markets and increase the price of vital goods such as medicines, seeds and educational materials.

Drahos and Mayne (2002) claim that global intellectual property rights highlight three key issues relating to peoples' concerns about globalization. First is the human rights issue. The Universal Declaration of Human Rights established the right to adequate health provision, food and education, and the right to share in the benefits of scientific progress. While these rights have, in

effect, the status of international law, their realization is being prohibited by 'the investment priorities of corporate intellectual property owners' (Drahos and Mayne, 2002, xi). Secondly, TRIPS skews the benefits of research in favour of those who can pay, rather than in favour of those who could benefit the most, a classic example being the provision of ARVs to people with HIV/AIDS (see below). Thus, the flow of knowledge is directed by financial rather than health interests. Thirdly, and perhaps most worryingly, Drahos and Mayne (2002) note that the WTO, which is meant to reflect the broader public interest through, for instance, the development of 'free trade' rules, is in effect providing a legal framework for global information monopolies and thus restricting free public access to knowledge.

While it should be noted that paragraph 7 of the 'Declaration on the TRIPS Agreement & Public Health' (Doha, WTO Ministerial, 2001) extends the implementation time for 'least developed countries', perhaps the more fundamental question is whether it makes sense to place similar restrictions on, for instance, Rwanda and the United States, with their hugely different capacities to develop essential pharmaceuticals, and their hugely different abilities to pay for ARVs to treat HIV/AIDS (Drahos, 2002). What, given such disparities, does an *equal* human right to health actually mean in these two countries?

Perhaps, the transnational character of many corporations implies a responsibility to provide the same life-saving medication at an equivalent unit of purchasing power across different countries, and a recognition that absolute losses in some markets will have to be off-set against substantial gains in other markets. However, perhaps an even stronger argument is that essential health-related knowledge should not be subject to IPR protection, that instead it is by its very nature a '*public good*' and must constitute an '*intellectual common*' from which all can gain. Drahos states 'It's hard not to conclude that through the rules of intellectual property the rich have found *new ways to rob the poor*' (Drahos, 2002, 6, italics added) and notes that 'Western models of intellectual property law [are] deeply discordant with [Western] development policies and strategies' (Drahos, 2002, 8). Similarly, Oxfam (2003) argues that WTO rules on IPR 'condemn millions of poor people to unnecessary sickness and suffering'.

In arguing that the world's poorest countries are the least likely to benefit from strong IPRs, Bannon and Roodman (2004, 4) also state that 'TRIPS most likely went too far in mandating uniform minimum standards for IPR protection, and failed to pay attention to the interests of the world's poorest countries'. The right of firms from rich countries to patent their technologies in poor countries, allows them to restrict generic imitations in those countries, thus reducing public access to life-saving medicines. Ironically, Beigbeder (2004) notes that 'Western-based

companies increasingly export medical experiments to developing countries, where patents are plentiful and government oversight is weak or non-existent' (p. 61).

Returning to the pervasive influence of HIV/AIDS, South Africa's attempt to pass legislation that would allow it to obtain cheaper generic drugs to treat HIV/AIDS, met with a strong response from the international pharmaceutical industry — a combined legal action by 39 global drug companies. However, the work of many organizations, including the local voluntary network, 'Treatment Action Campaign' and Oxfam were able to personalize and publicize the issue through personal testimonials from people with HIV/AIDS. The pharmaceutical industry made a huge PR blunder in the vigour of their response, subsequently leading to price cuts from the original US patented price of around USD10,000 per person per year, to around USD900 by March of 2001. However, Mayne (2002) notes that even this massive reduction could not compete with the price of USD289 offered by Indian-based generic manufacturers in August 2001. All of this bears on the importance of not having 'one-size-fits-all' IPR laws, but of such laws taking into account the differing social and economic contexts of where people get ill and their ability to fulfil their human rights to health.

Balasubramanian (2002) has argued that certain developing countries (e.g. India, China, Brazil) have developed pharmaceutical industries that use 'reverse engineering' to produce product equivalents, including new drugs. To explain, the processes that have been used in reverse engineering would be different from those used by the original developer to produce the product. Essentially, the process of reverse engineering involves working backwards from the end stage of the product to the initial stages of production in order to ascertain its constituent inputs. Prior to TRIPS, many countries with such a production capacity protected production *processes*, but *not products* — competitors could produce the same thing in different ways. The enforcement of TRIPS, however, will prevent such countries from *either* using the same process, *or* developing substantially the same product. This in turn will threaten the survival of these national pharmaceutical industries that had been supplying cheaper drugs to their citizens.

This is why the Indian Drug Manufacturer's Association has warned of a 'national health disaster' in a country where at present only 30% of the population can afford the (cheaper) drugs currently available, those in fact being some of the cheapest drugs in the world (Carr, 2004). Balasubramanian's (2002) summary is clear and simple: strengthening patent protection increases drug prices, weakening it promotes generic competition and decreases drug prices. Worryingly, Balasubramanian goes on to cite examples where the retail price of some proprietary drugs in developing countries is actually higher than their price in their (OECD) country of manufacture; and that in some

developing countries only proprietary brands are available, even when generic equivalents are available on the world market.

Conclusion

In sub-Saharan Africa, the reduction in health workers, at a time of increasing health service demands (due to the HIV/AIDS burden) is reaching crisis point. This crisis can only be tackled at the international level by addressing the unethical practice of deliberately targeting recruitment drives for health personnel at low-income countries, with the result that these low-income countries are effectively financing the training of health personnel to work in high-income countries. The partial repatriation of salaries to countries is not adequate compensation for this deliberate brain drain. Compensation for training costs needs to be addressed at government level, with international agreements and sanctions for engaging in unethical poaching of staff. Retaining staff in low-income countries requires governments to gain a better understanding of the factors that motivate and reward staff, so that appropriate incentives can be put in place to attract and retain staff in an environment that enhances productivity and acknowledges the 'glocality' of their situation (Carr, 2004).

The dilemmas presented by the TRIPS agreement with regard to health should be seen in the broader moral context that the pharmaceutical sector appears to be the most profitable sector, with sales in 2002 reaching $400.6 billion (www.ims-global.com). However, it is argued that substantial profits are needed to shoulder the high costs that go into the research and development of new drugs. An intriguing alternative model is where such research is publicly funded and pharmaceutical companies then compete to produce affordable patent-free drugs (Godrej, 2003). Godrej (2003, 12) argues against the 'commodification' of life-saving drugs and states: 'We need to ensure that none goes without life-saving drugs and their ability to pay should not enter into the decision'. Contrast this with a statement from Bernard Lemoine, director-general of France's National Pharmaceutical Industry Association (Foreman, 2002): 'I don't see why special effort is demanded from the pharmaceutical industry. Nobody asks Renault to give cars to people who don't have one'. While we would not wish to represent this shocking statement as being characteristic of the pharmaceutical industry as a whole, it is nonetheless noteworthy given its authoritative and potentially influential source. If we are to turn the tide of knowledge flowing away from the world's major health needs to align the behaviour of our global economy with the local needs of low-income countries, we must not only change the way in which people see the health problems of low-income countries but also increase the realization of our tacit participation in maintaining those problems.

Human resources and the provision of essential medicines are crucial vehicles that reflect the global flow of knowledge in the health sector. The eddies of personal and corporate self-interest should be not be criticized for their existence; rather, the system that reinforces these interests has to be challenged, so that it works for the benefit of those in the poorest of health. Our *chosen* policies direct the flow of knowledge and it is at the policy level that pressure must be used to turn the tide of an ebbing flow of knowledge away from low-income countries, and away from hope.

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