Background Paper

The Human Resource Crisis in Health Services

In Sub-Saharan Africa

By

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Abstract

Addressing the current state of human resources in health, the paper highlights the critical situation of the health workforce in sub-Saharan Africa. It examines the most recent workforce statistics and trends, including geographical distribution. The factors that have and are influencing the availability of human resources are briefly reviewed, focusing on the workforce motivation, the serious brain drain of health professionals, and the increasing impact of HIV/AIDS. The paper suggests that without renewed emphasis on the health workforce crisis, it will be hard for African countries to attain the health-related Millennium Development Goals.

[1] The World Bank

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I. Introduction

In 2000, all 189 United Nations member states endorsed the Millennium Development Goals (MDGs). This represented an unprecedented agreement within the development community about key development outcomes (OECD, 2002). The MDGs are a set of 8 goals, 18 targets and 48 performance indicators relating to poverty reduction by 2015. Of these, 4 are directly related to better health outcomes: two-third reduction of infant and under five mortality, three-fourth reduction of maternal mortality, halt and reverse HIV/AIDS, tuberculosis, and malaria epidemics, and halve the proportion of people suffering from hunger. By some estimates, US $46 billion per year is required to scale up health services in low-income countries, or implement the needed operations to achieve these MDGs. The majority of these funds would go towards human resource costs, which is a necessary step to increasing the access of the world's poor to essential health services. Only, then, will the disease burden be brought down to the level of the MDGs (WHO CMH, 2001).

This paper addresses the issue of human resources in the health sector, focusing on the situation in Africa due to its particularly, critical state. First, we examine the current condition of the health sector workforce, including the latest statistics and trends. Second, we analyze the economic factors that influence the availability of human resources. Next, we take a close look at the brain drain phenomenon, or exodus of trained health care professionals. Then, a discussion regarding the impact of the HIV/AIDS epidemic on the workforce itself and working conditions follows. Last, we conclude with some issues that governments and development partners must tackle to address the growing human resources crisis in the African health sector.

II. Country Estimates of Health Sector Workforce

Up-to-date statistics on human resources for health in Africa are scant, and when available they remain difficult to standardize and compare internationally.[2] Despite this data challenge, published figures of health personnel to unit population ratios from the 1960s through the mid-to-late 1990s—and some more recent figures—clearly indicate that a serious crisis in human resources exists. The severe shortage and imbalanced distribution of trained health personnel poses a serious obstacle to the achievement of the MDGs and to the improvement of the overall health of the poor. Here is a quantitative overview of the extent of this crisis.

Latest WHO Statistics

There are a range of indicators that measure the level of human resources for health apparent in a country's health services. The principal indicator is the stock of health personnel, typically measured by the proportion of health personnel among the total population. There are comparability issues in occupational classification, and the distinction between headcount and full-time equivalent of job positions (Diallo *et al.*, 2003). The main problem with this measurement of total population in many developing countries (especially in Africa) is that census results are variable and underused, and often fail to produce micro-data. The roles and professions of health care workers vary as well, making them difficult to define.

[2] At the time of writing, the most current comprehensive list of health personnel to unit population ratios was a database compiled by WHO's Statistical Information Service (WHOSIS) in 1998, available at http://www3.who.int/whosis. WHO staff, however, are currently working on updating that data using a variety of national health surveys. More information on this topic can be found in Diallo *et al.* (2003).

For example, health care-related occupations are mainly categorized under two groups according to the International Standard Classification of Occupations classification system:

1) "professionals" (incorporating physicians, nursing and midwifes, and other health professionals, such as dentists and pharmacists); and
2) "technicians and associate professionals" (medical assistants, dental assistants, physiotherapists, opticians, sanitarians, nursing and midwifery associate professionals and traditional medicine practitioners) (Diallo *et al.*, 2003).

Ostensively then, health personnel to population ratios are somewhat problematic for various reasons; nevertheless, they do provide the clearest starting point in recognizing the extent of the crisis.

The World Health Organization (WHO) Statistical Information Service lists such ratios for most countries and the figures for Africa are appallingly low, especially when compared to other emerging and developed countries. Figures 1 and 2 below summarize the relevant statistics for physicians, nurses, midwives, and pharmacists per 100,000 people in the population around 1998, where data was available. See also Tables 3 and 4 in the Annex. Ten African countries[3], out of 45, had fewer than five physicians per 100,000 people, and except for Tanzania, those same countries had fewer than 25 nurses per 100,000 people. The average ratio of doctors per 100,000 people in sub-Saharan Africa (SSA) was a meager 17.1, compared to an average of 303.7 in nine selected industrialized countries. For nurses, the same comparison was 89.7 in SSA and 723.6 in industrialized countries. On average, African countries had about 17 times fewer doctors and eight times fewer nurses than developed countries. Even compared to other emerging countries, SSA numbers are strikingly low. For India, Korea and Singapore and Vietnam combined, the average number of doctors per 100,000 people was 98.7; for nurses it was 221.1.

There is significant individual variation among countries throughout the continent. For example, Burkina Faso has 3.4 doctors and 19.6 nurses per 100,000 people compared to 202 doctors and 233 nurses per 100,000 people for Egypt. However, some others are faring a little better: Botswana has 23.8 doctors and 219.1 nurses per 100,000 people, while Congo has 25.1 doctors and 185.1 nurses per 100,000 people. South Africa is somewhat an anomaly with 56.3 doctors and 471.8 nurses per 100,000 people due to its unique history and population. Some of the out-migration issues South Africa faces are addressed in the section on brain drain. See Box 1 for the case of Malawi.

These statistics are not very determinative with regards to pharmacists. While they play a key role in people's access to medicines, very little data had been collected on their numbers, as shown by the fact that only a handful of countries reported data—both for the industrialized and developing countries.

[3] Burkina Faso, Central African Republic, Chad, Eritrea, Gambia, Liberia, Mali, Niger, Somalia, and Tanzania.

Figure 1

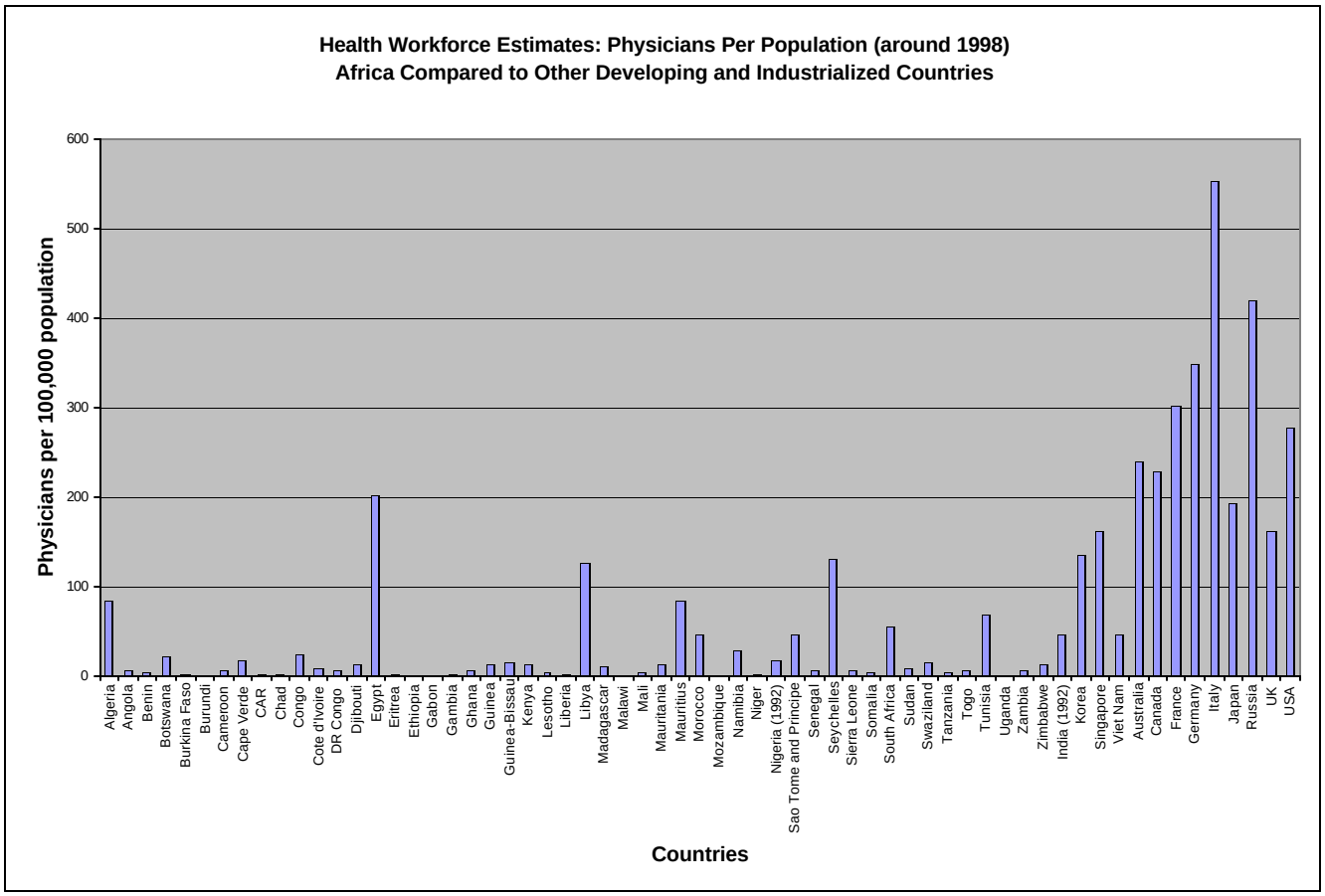
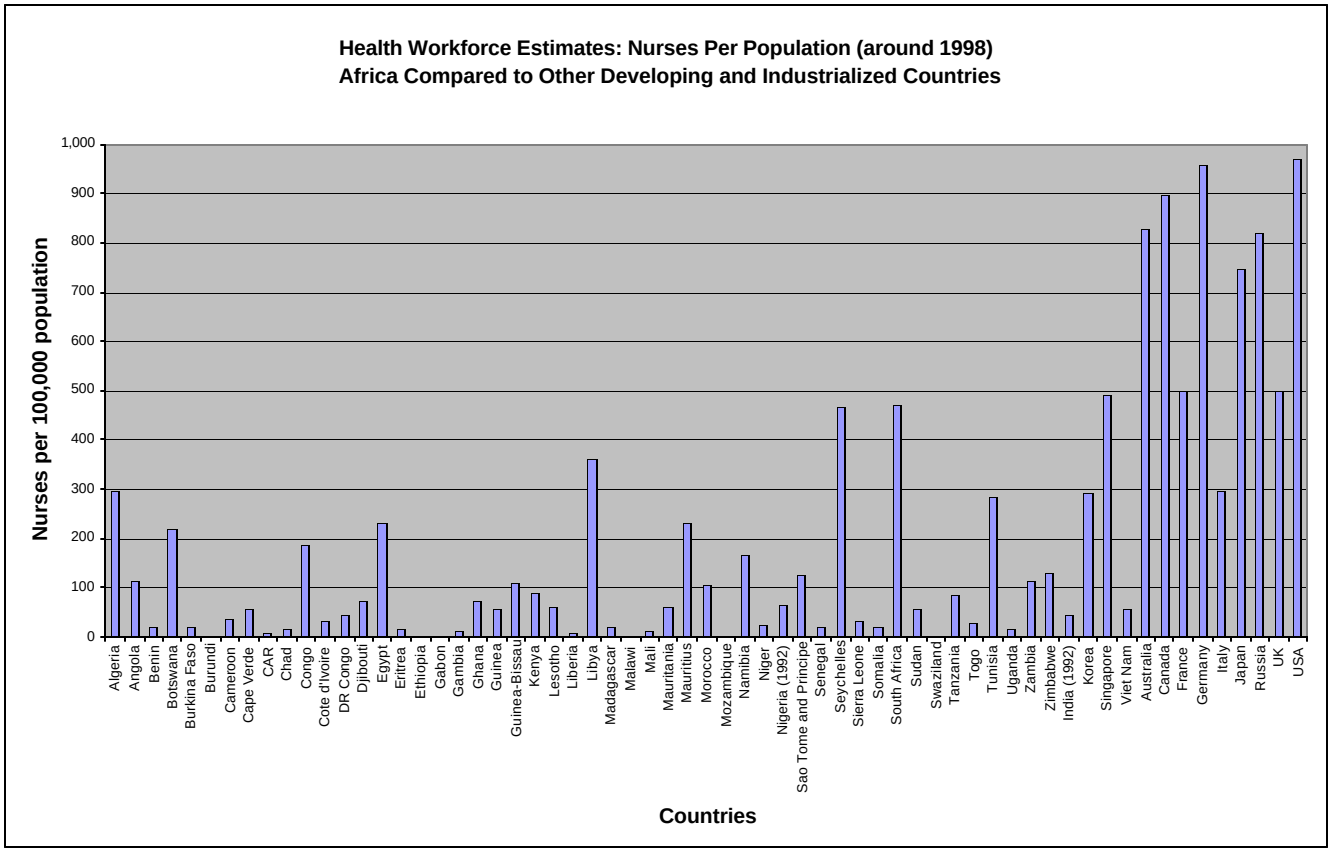


Figure 2



III. Trends in Health Workforce

The number of health sector workers has not even come close to keeping pace with the increasing population growth.[4] Although these statistics paint a discouraging picture, they provide only part of a larger picture. Issues of health worker distribution within a country and workplace conditions further compound the current crisis.

Figures 3 and 4 summarize the trends in doctors and nurses to population ratios since 1960 for 10 African countries and India (used as a comparator). See also Tables 5 and 6 in the Annex. The following are a few key observations:

- When compared to figures from either the 1970s or 1980s, 7 out of the 10 African countries[5] experienced a decline in doctors per population in the 1990s. Five of the African countries[6] experienced the same trend for nurses.

- The proportion of health personnel to population has stagnated or declined in nearly every African country, since 1960. Meanwhile, India has made considerable progress—increasing its doctor to population ratio from 17.2 in 1960 to 48 in the 1990s, and improving its nurse to population ratio from 10.4 to 45 over the same period.

- These figures indicate that ameliorating the human resources for health situation in Africa is an enormous challenge that must be surmounted to adequately serve poor populations. The experience of India shows that it can be done.

In addition to these figures, confirmation that the crisis continues and may be worsening was presented at a recent Consultation of 17 African countries organized by the World Bank and WHO. Background papers documented the following:

- In 1998, medical doctor vacancy rates in the public sector were reported at 43% in Ghana and 36% in Malawi.

- In 1998, public sector nurse vacancy rate was reported at 48% in Lesotho.

- Fifty percent of doctors in public services in Namibia are reported to be expatriates.

- Cameroon had no public recruitment of health personnel for 15 years.

- Data from Ghana, Zambia, and Zimbabwe suggest that annual losses from public sector health employment continue at rates of 15-40% (WHO/WB, 2002).

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[4] As of 2002, SSA had an estimated population of 693 million, which is expected to increase to 1081 million by 2025 according to the Population Reference Bureau's 2002 World Population Data Sheet.
[5] Cameroon, CAR, Ghana, Kenya, Madagascar, Tanzania, and Zambia.
[6] Burkina Faso, Cameroon, CAR, Ghana, and Madagascar.

Figure 3

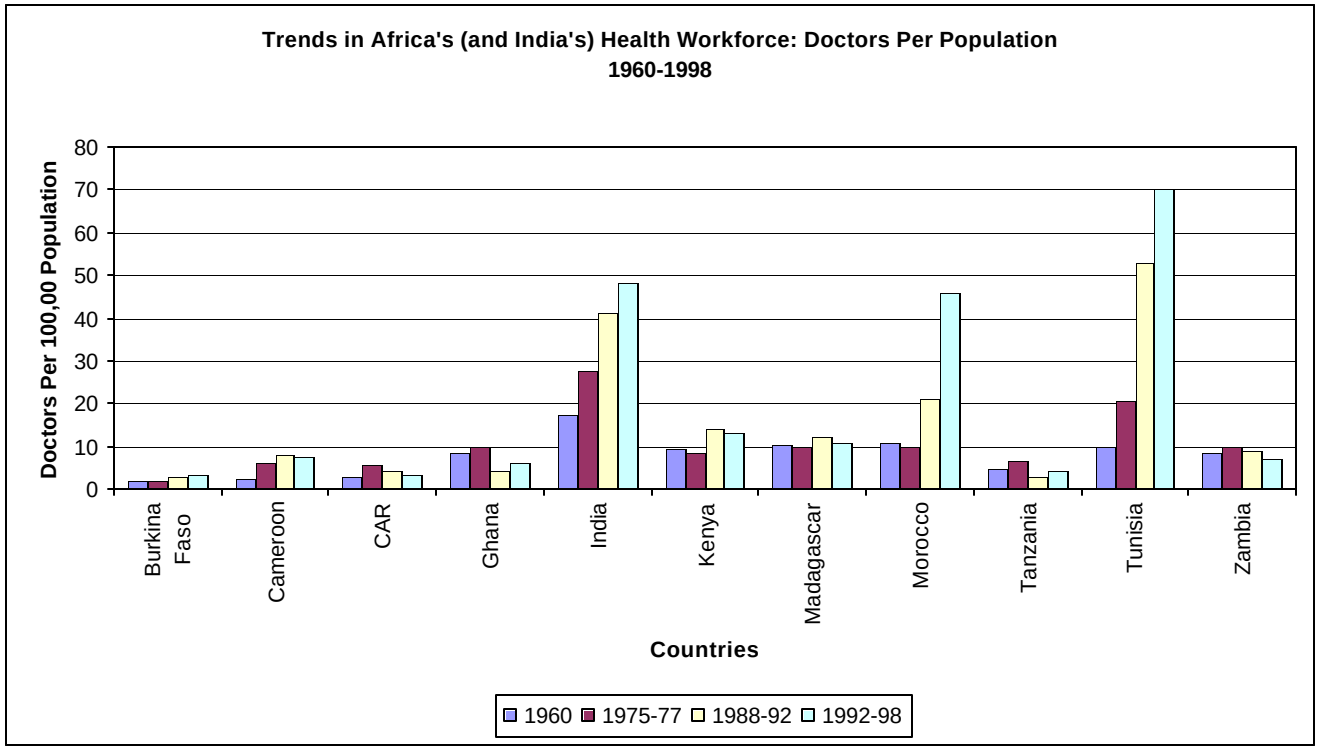
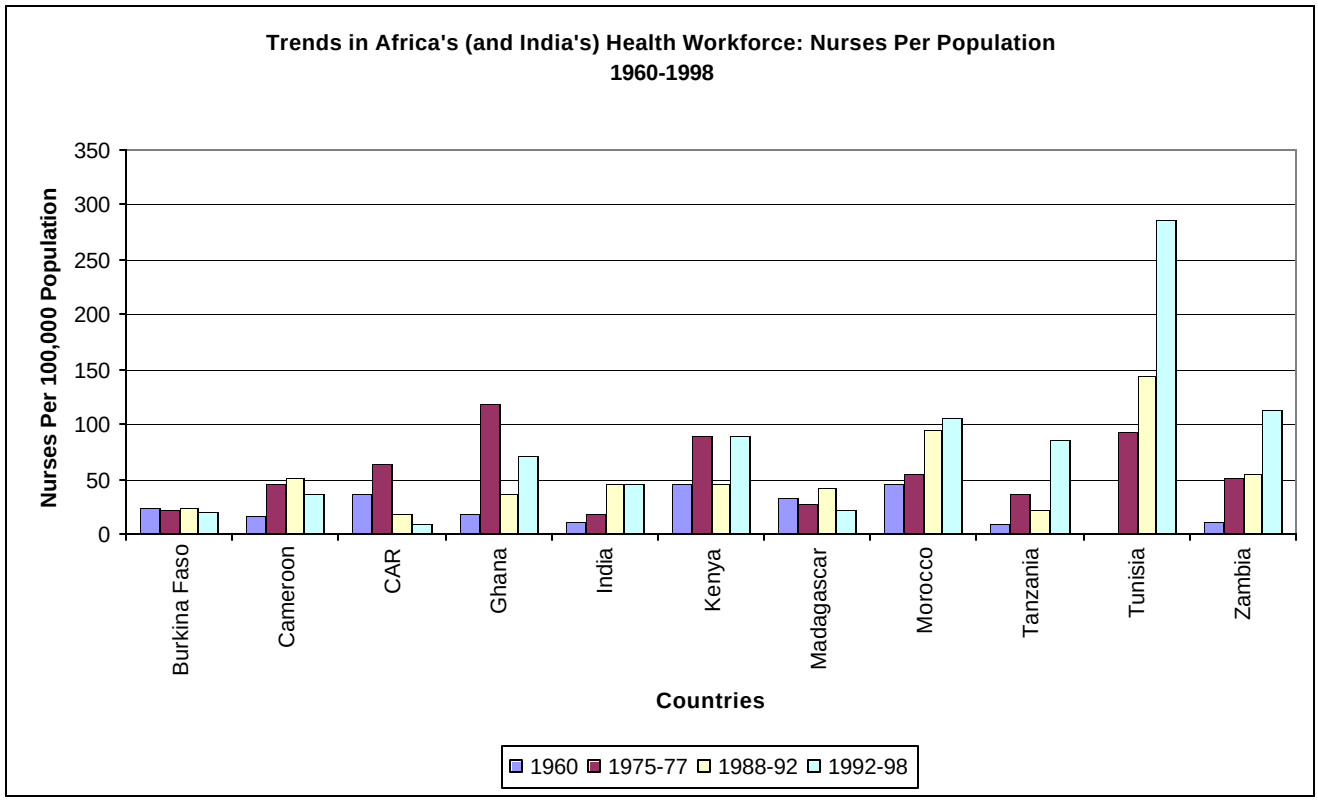


Figure 4



IV. Geographical Imbalances

Beyond national-level shortages of health personnel, imbalances in geographic distribution—especially between rural and urban areas—exacerbate the health workforce crisis (Dussault & Franceschini, 2003). In Ghana, Guinea, and Senegal, more than 50% of physicians are concentrated in the capital city where less than 20% of the population lives (Ghana MoH, 2002). In many countries, a similar situation exists for nurses, pharmacists, and medical technicians. For example, 55% of pharmacists in Ghana work in the Greater Accra region, which has only 16% of the total population; only 2% of Ghanaian pharmacists work in the Northern Region, with 10% of the population (Ghana MoH, 2002). See Annex Tables 5 and 6.

Other recent reports describe this urban-rural split dramatically. In Chad, for example, the capital region of N'Djaména was reported to have 71 physicians per 100,000 people in the population, whereas the Chari-Baguirmi region had only 2 physicians per 100,000 (Wyss *et al.*, 2002; Wyss *et al*., in press, cited in Kurowski, 2003). A report from Mali shows a similar imbalance. Nationwide, Mali was reported to have about 5.15 doctors per 100,000 people, but that ratio ranged from 18.7 in the capital region (Bamako) to a mere 1.9 in the Koulikoro region (Ministère de Santé, Mali, 2002).

Studies on the health workforce in Tunisia (which has much more adequate nation-wide ratios), Angola, and South Africa equally show geographical imbalances, implying that the urban-rural split is likely to be found continent-wide (Bchir & de Brouwere, 2000; Fresta, Fresta, & Ferrinho, 2000). This indicates that rural populations have much less access to health care services than do urban dwellers, and are often forced to travel significant distances to find any health care, even for their most basic needs.

V. Impact of Reform Processes

The crisis in the African health workforce has been emerging over several decades. Starting from very low levels in the 1960s, many countries' workforces progressed somewhat in the 1970s and 1980s, but stagnated or even declined in the 1980s and 1990s following the well-known wave of economic crises that hit the continent. Macroeconomic constraints discouraged the expansion of personnel and services; thus, the international community and developing country governments have given little attention to health-workforce issues in the past two decades. The health workforce was seen as a drain on the budget rather than an asset for poverty reduction, and unemployment of health professionals even appeared in countries where needs were enormous[7]. Some countries even enacted complete freezes on recruitment of certain health personnel (Ngufor, 1999; WHO/WB, 2002).[8]

The impact from a series of reform processes, starting in the mid-1980s, has been an important factor, which has largely determined the present situation. When many African countries were confronted with a dramatic fall in public revenue from exports for commodities, a series of important reforms were introduced. In many of the countries, the

[7] CREDESS, Paris, 1999 data for Ivory Coast, unpublished.
[8] See, for example, the case of Cameroon, Congo, and Cote d'Ivoire

Box 1: Malawi Faces Grave Shortage

The World Bank sponsored a Population, Health, and Nutrition Project in Malawi from 1991–2000. The Implementation Completion Report (ICR) found that under-staffed and under-supplied facilities have become increasingly common, with adverse effects on quality of care. A survey conducted by KPMG in 1999 showed that many district hospitals do not have doctors, that lower-level staff were performing higher-skill functions, and that even in tertiary facilities patients rarely see a doctor.

Among SSA countries, Malawi has consistently had one of the worst population to health worker ratios, with 2.22 physicians per 100,000 people in Malawi, compared to 4.55 in Kenya and 9.09 in Zambia (Picazo, 2002). Currently up to 50% of the available nursing posts are now unfilled. Malawi has struggled with low numbers of health professionals in the past, but the situation has become more acute due to: 1) low pay and poor staff benefits of government workers; 2) an exodus of government workers into the private sector, which offer better salaries and benefits; and 3) the increasing demand for skilled nurses in neighboring countries and in Europe.

The Malawi Nursing and Midwifery Council has also insisted they should produce higher skilled registered nurses (mainly hospital-based, with a longer and more expensive training period) rather than the lower skilled, but more cost-effective community health nurses. In addition, a lack of nursing tutors, severe scarcity of secondary school graduates, limited science education, and increasing death and morbidity from the AIDS epidemic all continue to contribute to the Malawi nursing shortage. Without improvements in training and remuneration of health professionals, Malawi will continue to lose valuable human resources.

reforms were executed through structural adjustment programs (SAP) of the World Bank and International Monetary Fund (IMF). A central tenet of these reforms included a better control of wages, reduction of public expenditures, privatization of public enterprises, elimination of subsidies, liberalization of the economy, and devaluation of currency in order to achieve sustained growth.

Results of these measures on public servants, particularly on health personnel, were not dramatically different from one country to another. The impact is a lasting one, largely determining the attitudes of health providers and the actual availability of health personnel. In most countries, the SAP reforms went along with public service reform and decentralization of the health sector. Case studies for Cameroon and Ghana, where detailed research is available including interview surveys with health personnel, are illustrative of the impacts (See Box 2).

Although availability of health personnel is a critical issue, a review of World Bank documents in six African countries found that this issue was not adequately taken into consideration—either in magnitude or in dimension (WB/OED, 1999). Moreover, health workforce issues were often not considered, when setting specific health objectives, or promoting civil service or health sector reforms, or not understood in terms of other incentives, preventing governments from addressing workforce shortages.

Box 2: The Impact of Structural Adjustment Programs in Cameroon and Ghana

In Cameroon, government reform was initiated in the early 1980s as part of their Structural Adjustment Program (SAP) administered by the World Bank and International Monetary Fund (IMF). Measures affecting the health sector resulted in suspending recruitment, strict implementation of retirement at 50 or 55, limiting employment to 30 years, suspension of any financial promotion, reduction of additional benefits (housing, travel expenses, etc.), and two salary reductions—totaling 50% and a currency devaluation resulting in an effective income loss of 70% over 15 years. In addition, paramedical training for nurses and laboratory technicians was suspended for several years and schools closed.

The overall effect was dramatic. In 1999, the health sector budget had shrunk to 2.4% of the national budget from 4.8% in 1993. These adjustments occurred while in the private sector (40% of service provision—mostly denominational) income substantially increased adjusting again for the effects of the devaluation. Thus, the spread between public and private health worker income is large. Not surprisingly, in 1999, jobs in the public sector were about 80% unfilled, and Cameroon had a truly de-motivated health workforce.

Notwithstanding the efforts of many health workers to provide services, in general, a laissez faire attitude prevails—with under the table payments, absenteeism and a lack of attention to quality. The perception of punishment inflicted by the IMF and the World Bank is still common. On the positive side, however, budgets have been decentralized and are now available locally and the private sector has been strengthened. The serious shortage of health workers, though, has lead to the direct recruitment of qualified personnel by communities and hospitals, which have the financial resources.

In Ghana, the reform process focused on national democratization, decentralization, and the creation of the Ghana health services. While the civil service lost 32,000 jobs between 1987-1989, the health sector remained somewhat a priority and faired better than other sectors. There was also meaningful sector reform with emphasis on the quality of services. Health workers have received some benefits—such as first priority housing in rural areas and increased salaries in urban areas. Despite the well-documented severe shortage of health workers and significant brain drain, the motivation of the health workforce remains good in Ghana (Wiskow, 1999).

VI. Brain Drain

Emigration of highly skilled persons from developing to developed countries has increased in the last decade (Lowell & Findlay, 2001). Growing concerns among many developed countries about actual or future shortages has initiated large-scale recruitment of foreign-trained health workers. Foreign-trained health professionals are estimated to represent more than a quarter of the medical and nursing workforces of Australia, Canada, the UK, and the US (OECD, 2002), and the needs are rapidly growing. This trend is expected to increase with health professionals being increasingly recruited from SSA. The number of overseas trained nurses and midwives registering with the United Kingdom Co-operative Council from SSA[9] increased from 905 in 1998-99 to 2133 in 2000-01 (Martineau *et al.*, 2002). Moreover, it was estimated that 15,000 foreign nurses were recruited in the U.K. in 2001 and that 35,000 more are needed by 2008 (USAID SARA, 2003). The permanent departure of skilled labor, or brain drain, is depleting

[9]Statistics taken from South Africa, Zimbabwe, Nigeria, Ghana, Zambia, Kenya, and Malawi.

human capital in many developing countries and further reducing the possibility for strong economic growth. Lowell and Findlay (2001) aptly interpret brain drain as "the emigration or flight of skilled human capital from one country to the other in search of better returns to one's knowledge, skills, qualifications, and competencies." Simply put, the emigration of an individual is a brain drain because s/he is an investment loss to her country by not using the education gained (up to university level) to work there.

A pattern has emerged where doctors and nurses are continually moving to countries with a perceived higher standard of living, creating what has been referred to as a "carousel" of movement (Martineau, 2002). Canada for instance recruits primary care physicians from South Africa to work in remote areas, leaving South Africa to fill vacancies by recruiting abroad as well. More than 600 South African doctors are registered in New Zealand, at a cost to South African taxpayers of roughly $37 million, reports the University of Western Cape, South Africa. As of 1999, 78% of rural doctors in South Africa were from abroad, mostly from Cuba (OECD, 2002). South Africa presents a rare case because it is one of the few developing countries that pays comparatively higher salaries and is, thus, able to compensate for emigration. Many other sub-Saharan countries are not able to pay competitive salaries and are, therefore, not able to attract health personnel from abroad.

This brain drain is a particular problem in Africa where the challenge of developing and retaining human resources is extremely difficult and fundamental for development (Wadda, 2000). Although data on this phenomenon is sketchy, the International Office for Migration estimates that 300,000 African professionals live and work in the West (Shinn, 2002). Country-specific information shows large losses of health sector personnel. In Ghana, for example, a continuous flow of doctors, nurses, midwives, and pharmacists have left the country directly after receiving their degrees (See Box 3). According to its Health Minister, Kenya has only retained 600 of 6000 doctors trained in public hospitals. This number rose to 1200 after increasing compensation for doctors, which is still below the requirement. Similarly, 4000 Kenyan nurses have left for the UK and the US (Halting Africa's health brain drain, 2003). In Zimbabwe, only 360 of 1200 doctors trained during the 1990s were practicing in their country in 2000; half of those trained in Ethiopia and Zambia have also emigrated (Frommel, 2002).

Box 3: Ghana's Loss of Health Sector Workers

The State of Ghanaian Economy Report 2002 states that 31% of trained health personnel, including doctors, nurses, midwives, and pharmacists, left the country between 1993-2002. This resulted in the current ratio of approximately 1.48 physicians per 100,000 people (Safo, 2003). This may be an underestimation when compared to a report on Human Resources by the Government of Ghana (Table 1), which includes significantly greater numbers of an array of categorized health workers lost in biannual trends from 1996 to 2002. While both reports signify the extensive degree of brain drain in Ghana, it is questionable whether any of the currently existing records demonstrate accuracy, consistency, and reliability, since variations occur from report to report. As seen in Table 2, the University of Ghana Medical School, the School of Medical Sciences of KNUST, and the UDS Medical School train approximately 150 medical officers annually. However, 50% of every graduating class leaves the country within the second year, while 80% leave by the fifth year (Safo, 2003).

This exodus of medical officers is mirrored in other health sector professions. Out of 944 pharmacists trained from 1995-2002, a total 410 had left the country by the end of 2002. The number of nurses and midwives immigrating to foreign countries is greatest compared to all other categories; of the 10,145 trained between that same period, 1,996 left Ghana by the end of 2002 (Safo, 2003). It is also noteworthy to mention that only 12 medical laboratory technologists are produced annually as of 2002 without guarantee of remaining in Ghana after graduation (Ghana MoH, 2002).

Table 1. Trends in Loss of Trained Public Sector Health Staff, Ghana

CATEGORY	1996	1998	2000	2002
Doctors	1,154	1,132	1,015	964
Nurses (including auxiliaries)	14,932	15,046	13,742	11,325
Pharmacists			230	200

Source: Ghana MoH. (2002). Human Resources Projections from Internal Report.

Table 2. Annual Output of Trained Public Sector Health Staff, Ghana

CATEGORY	Annual Production
Doctors	150*
Professional Nurses	500
Midwives	200
Community Health Nurses	200

Source: Ghana MoH. (2002). Human Resources Projections, Internal Report.
*Safo, A. (2003, July 7). 604 doctors abandon Ghana. *Public Agenda*.

Factors Contributing to Out-migration

To exactly define the factors contributing to out-migration is a difficult task because most health professionals do not report their intention to emigrate; they simply vacate their posts, resign, or ask for leave without pay for an infinite period of time (Awases *et al.*, 2003). Despite this, and that the causes and extent of emigration vary from one country to another, the most common causes can be reduced to poor economic performance, insufficient creation of new jobs, and a limited capacity to absorb qualified personnel. Negative side effects of SAPs, with their associated measures to eliminate or reduce budget deficits and public expenditure, downsizing or retreat of government from economic activity, and the liquidation or privatization of enterprises have also led to the emigration of professionals (Mato, 2002). Awases *et al*. (2003) report that other de-motivating factors include a lack of opportunities for continuing education and training, mediocre quality education and training, and inadequate day care facilities for their children.

Political instability, poor working conditions, low salaries, and an overall de-motivated workforce have also been cited as factors contributing to out-migration. Today, health professionals in SSA work in extraordinary circumstances. The pressure of having too many patients increases daily stress levels and leads to poor quality of care. Poor working conditions are reported to seriously undermine health systems performance by thwarting staff morale and motivation, and directly contributing to problems in recruitment, retention, and attrition (WHO, 1996). While the many aforementioned factors may de-motivate and discourage health care workers, other studies have found that most individuals who do *stay* in the health sector, work hard and receive recognition and status from colleagues and family (Stillwell, 2001).

VII. Impact of HIV/AIDS on Health Sector

While we have touched upon some of the issues affecting the number, distribution, and performance of workers in the health sector, the enormous impact of the HIV/AIDS epidemic merits its own discussion. The epidemic has impacted health sector manpower in two ways: 1) direct costs—labor loss, disability and death benefits, and increasing medical aid costs; and 2) indirect costs—increased absenteeism, reduced productivity, and stressed workforce from additional staff recruitment and training of personnel (Kinoti, 2001).

With a generalized epidemic of HIV/AIDS in many African countries, health care workers themselves are being infected, as they are part of the adult, sexually active population. The impact of HIV/AIDS is serious and is estimated to be the cause of between 19-53% of all deaths of government health employees in African countries, today (Tawfik & Kinoti, 2001). This results in attrition due to death and absenteeism due to sickness. For example, by some estimates a person living with AIDS may be away from work for up to half the time of their final year of life (ibid). Caring for ill family members or dependents and attending funerals also contributes to worker absenteeism.

Caring for AIDS patients has made the work environment more complex, difficult and stressful as well as a chilling place to work—with the fear of infection and also with a constant observance of patients dying. One study of Zairean nurses indicated that they had to "work significantly more, sometimes at double effort, to care for AIDS patients" (Lombela, 1996; cited in Kinoti, 2002).

The HIV/AIDS epidemic has placed additional strain on the health care sector and contributed to the human resource crisis. But the extent of the impact of HIV/AIDS on the health care sector is not fully known. More comprehensive country-level assessments of the impact are needed.

VIII. Conclusion

Given the crisis in the health sector human resources outlined in this paper, the health-related MDGs are arguably difficult targets for most African countries to attain. However, MDGs are useful in highlighting underlying problems or constraints hindering their attainment. See Box 4 below for case studies.

Box 4: Requirements for Scaling Up: Case Study of Chad and Tanzania

In 2003, Kurowski *et al.* undertook case studies of Tanzania and Chad to look at the 'role and importance' of human resources for scaling up health services in low-income countries. This study examined the size, structure, and compositions of the health workforces; estimated future human resource availability and requirements for scaling up priority interventions as recommended by the Commission on Macroeconomics and Health.

The study indicates that future staff availability is grossly insufficient for the scaling up of priority interventions, accounting for only 40% and 20% of requirements in Tanzania and Chad, respectively, by 2015. Shortages are likely to be greater than indicated, since the total health workforce would not be available for the provision of priority interventions. Even if training capacities would be immediately increased by 50%, the 2015 workforce would constitute only 45% and 25% of total human resource requirements.

The study also identified four priority issues for scaling up, which merited further research: 1) geographical imbalances must better be understood and overcome; 2) more needs to be known about health staff attrition rates—especially due to emigration—which has implications for training; 3) how can staff productivity (estimated at approximately 50 to 65%) can be improved through better staff management; and 4) alternative service delivery mechanisms need to be developed. Finally, the authors urged decades-long international commitment to scaling up, to ensure that the efforts made are not wasted.

Some of the key issues that African governments and development partners should focus on, to address this human resource crisis in the health sector, include:

- Recognizing the importance to align health sector, civil service and macroeconomic policies and their objectives to improve the HWF performance

- Acknowledging that African countries must offer internally competitive wages and benefit packages to retain highly trained staff; this includes increasing compensation so that workers receive a living wage, and do not have to seek outside employment or under-the-table payments for services to survive

- Investing into training capacities, in particular training that is specifically oriented to the needs of national markets to stem brain drain

- Improving training and knowledge regarding HIV/AIDS to decrease risk for workers, address fears and misconceptions, and improve patient care

- Investing into HIV/AIDS prevention and care to mitigate the impact of the epidemic on the demand for health services and to prevent any further depletion of the workforce

- Exploiting alternative service delivery mechanisms (community based, syndromic approaches) to reduce the workload of health personnel

- Improving the non-monetary incentive frameworks faced by health personnel (e.g. continuous training, supervision, appropriate equipment) to improve motivation and thus the productivity and quality of the health workforce

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.

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Annex

Table 3: WHO Estimates of Health Personnel Per Population From Africa

Figures are from one year between 1994-1998, unless otherwise noted

	Rate per 100,000 population / Year			
Country	**Physicians**	**Nurses**	**Midwives**	**Pharmacists**
Algeria	84.6	297.8	NA	NA
Angola	7.7	114.5	4.3	NA
Benin	5.7	20.4	7.9	NA
Botswana	23.8	219.1	0.0	NA
Burkina Faso	3.4	19.6	3.4	NA
Cameroon	7.4	36.7	0.5	NA
Cape Verde	17.1	55.6	NA	NA
CAR	3.5	8.8	4.9	NA
Chad	3.3	14.7	2.3	NA
Congo	25.1	185.1	24.9	NA
Côte d'Ivoire	9.0	31.2	15.0	NA
DR Congo	6.9	44.2	NA	NA
Djibouti	14.0	74.0	NA	2.0
Egypt	202.0	233.0	NA	56.0
Eritrea	3.0	16.0	2.2	NA
Gambia	3.5	12.5	8.2	NA
Ghana	6.2	72.0	53.2	NA
Guinea	13.0	55.7	5.2	NA
Guinea-Bissau	16.6	109.4	12.7	NA
Kenya	13.2	90.1	NA	NA
Lesotho	5.4	60.1	47.0	NA
Liberia	2.3	5.9	4.3	NA
Libya	128.0	360.0	NA	23.0
Madagascar	10.7	21.6	10.7	NA
Mali	4.7	13.1	3.0	NA
Mauritania	13.8	62.4	10.1	NA
Mauritius	85.0	232.9	NA	NA
Morocco	46.0	105.0	NA	11.0
Namibia	29.5	168.0	116.5	NA
Niger	3.5	22.9	5.5	NA
Nigeria (1992)	18.5	66.1	52.4	NA
Sao Tome and Principe	46.7	127.4	29.6	NA
Senegal	7.5	22.1	6.6	NA
Seychelles	132.4	467.6	394.6	NA
Sierra Leone	7.3	33.0	4.7	NA
Somalia	4.0	20.0	NA	0.1
South Africa	56.3	471.8	NA	NA
Sudan	9.0	58.0	NA	1.1
Swaziland	15.1	NA	NA	NA
Tanzania	4.1	85.2	44.8	NA
Togo	7.6	29.7	10.4	NA

Tunisia	70.0	286.0	NA	17.0
Uganda	NA	18.7	13.6	NA
Zambia	6.9	113.1	NA	NA
Zimbabwe	13.9	128.7	28.1	NA
Africa Region Average	**27.2**	**106.6**	**30.9**	**NA**

Source: WHO Statistical Information Service. May be accessed at http://www3.who.int/whosis.

Table 4: WHO Estimates of Health Personnel Per Population, Averages

Figures are from one year between 1994-1998, unless otherwise noted

	Rate per 100,000 population / Year			
Country	**Physicians**	**Nurses**	**Midwives**	**Pharmacists**
Sub-Saharan Africa Average	**17.1**	**87.4**	**30.9**	**1.1**
Sub-Saharan Africa without South Africa Average	**16.1**	**77.3**	**30.9**	**1.1**
North African Average*	**106.1**	**256.4**	**NA**	**26.8**
Four Emerging Countries'				
India (1992)	48.0	45.0	NA	NA
Korea	136.1	291.2	NA	NA
Singapore	162.7	492.1	NA	NA
Viet Nam	48.0	56.0	17.6	NA
Four Emerging Countries' Average	**98.7**	**221.1**	**NA**	**NA**
Industrialized Countries				
Australia	240.0	830.0	40.0	NA
Canada	229.1	897.1	NA	NA
France	303.0	497.0	21.7	100.0
Germany	350.0	957.0	11.3	57.7
Italy	554.0	296.0	29.2	102.0
Japan	193.2	744.9	18.9	NA
Russia	421.0	821.0	62.5	6.2
UK	164.0	497.0	43.3	58.2
USA	279.0	972.0	NA	NA
Industrialized Countries' Average	**303.7**	**723.6**	**32.4**	**64.8**

Source: WHO Statistical Information Service. May be accessed at http://www3.who.int/whosis.

* Algeria, Egypt, Libya, Morocco, and Tunisia

Table 5: Trends in Physicians 1960-1998[10]

	Doctors per 100,000 population per year*			
Country	**1960**	**1975-77**	**1988-92**	**1992-98**
Burkina Faso	1.7	1.8	3.0	3.4
Cameroon	2.5	6.1	8.0	7.4
CAR	2.8	5.7	4.0	3.5
Ghana	8.2	10.0	4.0	6.2
India	17.2	27.6	41.0	48.0
Kenya	9.5	8.4	14.0	13.2
Madagascar	10.4	9.8	12.0	10.7
Morocco	10.6	9.9	21.0	46.0
Tanzania	4.8	6.5	3.0	4.1
Tunisia	10.0	20.8	53.0	70.0
Zambia	8.3	9.8	9.0	6.9

* Figures are from an individual year within the given period.

Table 6: Trends in Nurses 1960-1998[7]

	Nurses per 100,000 population per year*			
Country	**1960**	**1975-77**	**1988-92**	**1992-98**
Burkina Faso	22.9	22.1	24.6	19.6
Cameroon	16.3	44.8	51.2	36.7
CAR	36.2	64.1	18.0	8.8
Ghana	18.4	119.0	36.4	72.0
India	10.4	17.6	45.1	45.0
Kenya	44.8	89.3	44.8	90.1
Madagascar	32.2	28.2	42.0	21.6
Morocco	45.7	54.6	94.5	105.0
Tanzania	9.6	36.2	21.9	85.2
Tunisia		93.4	143.1	286.0
Zambia	10.1	51.8	54.0	113.1

* Figures are from an individual year within the given period.

[10] Annual statistics from the World Bank and WHO. See: World Bank. 1978 and 1980. *World Development Report: World Development Indicators*; World Bank. 1993. *World Development Report: Investing in Health.* p. 208; and WHO. 1998. WHOSIS database. Available at http://www3.who.int/whosis.

Table 7: Health Personnel Statistical Database

	GDP (2002)	Income level	Region	Population (2002)	IMR 1990	IMR 2000-2002	Physicians per 100,000 (1995-1999)	Year	Nurses per 100,000 (1995-1999)	Year	Midwives per 100,000 (1995-1999)	Year	Dentists per 100,000 (1995-1999)	Year	Pharmacists per 100,000 (1995-1999)	Year
Afghanistan		1	3	27,963,000	167	165	11	*1997*	18	*1997*			1	*1997*	2	*1997*
Albania	$1,071	2	4	3,195,100	37	23	129	*1998*	380	*1998*	59.1	*1994*	31.5	*1996*	40.6	*1994*
Algeria	$1,657	2	5	31,320,000	42	39	84.6	*1995*	297.8	*1995*	...	...	28.2	*1995*	...	...
American Samoa				70,000	0											
Andorra		5	4	70,000	0	6	253	*1998*	283	*1998*	9.4	*1998*	53.1	*1998*	89.1	*1998*
Angola	$598	1	1	13,896,000	166	154	7.7	*1997*	114.5	*1997*	4.3	*1997*	0	*1997*	...	...
Antigua and Barbuda	$9,204	5	6	68,890	0	12	113.6	*1996*	330.3	*1996*	...	...	18.2	*1996*	...	...
Argentina	$6,579	3	6	37,928,000	25	16	268.4	*1992*	76.8	*1994*	...	...	66.2	*1997*	...	...
Armenia	$1,495	2	4	3,072,000	50	31	316	*1998*	481	*1998*	48.1	*1998*	27.6	*1998*	3.8	*1998*
Aruba		5	6	90,000	0											
Australia	$24,801	4	2	19,581,000	8	6	240	*1998*	830	*1998*	40	*1998*	40	*1998*	...	...
Austria	$33,480	4	4	8,140,900	8	5	302	*1998*	532	*1998*	18.6	*1997*	47.2	*1998*	52.8	*1997*
Azerbaijan	$505	1	4	8,184,300	84	77	360	*1998*	767	*1998*	137	*1998*	27.1	*1998*	33.1	*1998*
Bahamas, The	$13,836	5	6	313,990	24	13	151.8	*1996*	229.7	*1996*	...	...	25.4	*1996*	...	...
Bahrain	$11,070	5	5	671,970	15	13	100	*1997*	283	*1997*			9	*1997*	20	*1997*
Bangladesh	$396	1	3	135,680,000	96	51	20	*1997*	11	*1997*	...	...	...	...	...	...
Barbados	$8,610	5	6	269,380	14	12	125.4	*1993*	330.3	*1993*	...	...	16.1	*1993*	...	...
Belarus	$1,579	2	4	9,930,800	18	17	443	*1998*	1182	*1998*	67.6	*1998*	40.6	*1998*	30.7	*1998*
Belgium	$31,333	4	4	10,320,000	8	5	395	*1998*	1075	*1996*	65	*1996*	68.2	*1998*	145	*1998*
Belize	$3,227	3	6	253,330	39	34	54.8	*1996*	82	*1996*	...	...	10.6	*1996*	...	...
Benin	$435	1	1	6,603,400	111	94	5.7	*1995*	20.4	*1995*	7.9	*1995*	0.3	*1995*	...	...
Bermuda		5	6	60,000	0											
Bhutan	$580	1	3	850,820	0	74	16	*1995*	39	*1995*	56	*1995*	...	...	...	...
Bolivia	$947	2	6	8,697,100	87	60	129.9	*1997*	69.4	*1997*	...	...	21.1	*1997*	...	...
Bosnia and Herzegovina	$1,671	2	4	4,120,600	18	15	143	*1998*	452	*1998*	35.8	*1991*	19	*1998*	11	*1998*
Botswana	$4,233	3	1	1,711,800	45	80	23.8	*1994*	219.1	*1994*	0	*1994*	2.2	*1994*	...	...
Brazil	$4,644	2	6	174,490,000	50	31	127.2	*1996*	41.3	*1996*	...	...	85.1	*1996*	...	...
Brunei	$17,650	5	2	350,630	10	6	84.8	*1996*	401.5	*1996*	...	...	12.8	*1996*	...	...
Bulgaria	$1,733	2	4	7,868,000	15	14	345	*1998*	713	*1998*	70.6	*1998*	58.6	*1998*	18.5	*1998*
Burkina Faso	$258	1	1	11,831,000	118	104	3.4	*1995*	19.6	*1995*	3.4	*1995*	0.3	*1995*	...	...
Burundi	$143	1	1	7,071,000	114	114	...	...	...	...	...	...	...	...	...	...

Cambodia	$325	1	2	12,487,000	80	97	29.7	*1998*	73.8	*1998*	28.8	*1998*	1.8	*1998*	...	...
Cameroon	$711	1	1	15,523,000	85	96	7.4	*1996*	36.7	*1996*	0.5	*1996*	0.4	*1996*	...	...
Canada	$23,590	4	6	31,414,000	7	5	229.1	*1995*	897.1	*1996*	...	...	58.6	*1997*	...	...
Cape Verde	$1,571	2	1	458,030	45	29	17.1	*1996*	55.6	*1996*	...	...	1.5	*1996*	...	...
Cayman Islands		5	6	35,000	0											
Central African Republic	$348	1	1	3,828,000	115	115	3.5	*1995*	8.8	*1995*	4.9	*1995*	0.2	*1995*	...	...
Chad	$248	1	1	8,144,400	118	117	3.3	*1994*	14.7	*1994*	2.3	*1994*	0.2	*1994*	...	...
Channel Islands		5	4	149,000	7	6										
Chile	$5,436	3	6	15,579,000	16	10	110.3	*1994*	47.2	*1996*	...	...	41.5	*1996*	...	...
China	$942	2	2	1,281,000,000	38	31	161.7	*1998*	98.6	*1998*	3.9	*1998*	...	...	...	...
Colombia	$2,274	2	6	43,745,000	29	19	116	*1997*	48.3	*1994*	...	...	40.3	*1994*	...	...
Comoros	$436	1	1	585,940	88	59	7.4	*1997*	34.1	*1997*	14	*1997*	14	*1997*	...	...
Congo, Dem. Rep.	$87	1	1	53,797,000	128	129	6.9	*1996*	44.2	*1996*	...	...	1.1	*1996*	...	...
Congo, Rep	$87	1	1	53,797,000	128	129	25.1	*1995*	185.1	*1995*	24.9	*1995*	...	...	...	...
Cook Islands	$0			0	83	81	90	*1997*	200	*1997*	30	*1997*	90	*1997*	...	...
Costa Rica	$3,927	3	6	3,941,800	15	0	141.1	*1997*	109.1	*1997*	...	...	39.4	*1997*	...	...
Côte d'Ivoire	$712	1	1	16,775,000	100	102	9	*1996*	31.2	*1996*	15	*1996*	...	...	...	...
Croatia	$5,549	3	4	4,376,900	11	7	229	*1998*	474	*1998*	33	*1998*	65.7	*1998*	45.5	*1998*
Cuba		2	6	11,263,000	11	7	530.4	*1997*	677.6	*1997*	...	...	84.5	*1997*	...	...
Cyprus	$14,800	5	4	764,970	11	5	255	*1996*	447	*1996*			65	*1995*	104	*1995*
Czech Republic	$5,691	3	4	10,210,000	11	4	303	*1998*	886	*1998*	44.7	*1998*	62	*1998*	44.3	*1998*
Denmark	$39,211	4	4	5,373,300	8	4	290	*1994*	722	*1994*	21.1	*1997*	88.6	*1995*	18.2	*1994*
Djibouti	$775	2	5	656,510	119	100	14	*1996*	74	*1996*			1.7	*1996*	2	*1996*
Dominica	$3,157	3	6	71,800	19	14	49.3	*1996*	415.5	*1996*	...	...	5.6	*1996*	...	...
Dominican Republic	$2,129	2	6	8,634,700	53	41	215.6	*1997*	29.9	*1997*	...	...	23.4	*1997*	...	...
Ecuador	$17,046	2	6	13,112,000	43	24	169.6	*1997*	70.1	*1997*	...	...	63.9	*1997*	...	...
Egypt, Arab Rep.	$1,250	2	5	66,372,000	76	35	202	*1996*	233	*1996*			25	*1996*	56	*1996*
El Salvador	$1,763	2	6	6,523,900	46	33	107.1	*1997*	34.9	*1997*	...	...	35.6	*1997*	...	...
Equatorial Guinea	$1,541	1	1	481,420	122	101	24.6	*1996*	39.5	*1996*	2.2	*1996*	1	*1996*	...	...
Eritrea	$166	1	1	4,308,800	92	72	3	*1996*	16	*1996*	2.2	*1996*	0.1	*1996*	...	...

Estonia	$5,000	3	4	1,358,000	12	11	297	*1998*	625	*1998*	37.4	*1998*	67.9	*1998*	53.5	*1998*
Ethiopia	$124	1	1	67,335,000	128	116	...	...	...	...	...	...	...	...	...	...
Faeroe Islands		5	4	50,000	0											
Fiji	$2,910	2	2	823,300	25	18	47.6	*1997*	195.1	*1997*	...	...	4.3	*1997*	...	...
Finland	$32,575	4	4	5,199,000	6	4	299	*1998*	2162	*1998*	78	*1998*	93.7	*1998*	145	*1998*
France	$30,667	4	4	59,442,000	7	4	303	*1997*	497	*1996*	21.7	*1996*	67.8	*1996*	100	*1997*
French Polynesia	$19,895	5	2	239,800	18	10										
Gabon	$4,405	3	1	1,290,600	60	60	...	...	...	...	...	...	...	...	...	...
Gambia, The	$370	1	1	1,375,700	103	91	3.5	*1997*	12.5	*1997*	8.2	*1997*	0.5	*1997*	...	...
Georgia	$537	1	4	5,177,000	24	24	436	*1998*	474	*1998*	31.1	*1998*	35.3	*1998*	9.2	*1998*
Germany	$32,807	4	4	82,495,000	7	4	350	*1998*	957	*1998*	11.3	*1997*	75.9	*1998*	57.7	*1998*
Ghana	$432	1	1	20,071,000	74	57	6.2	*1996*	72	*1996*	53.2	*1996*	0.2	*1996*	...	...
Greece	$14,157	4	4	10,631,000	10	5	392	*1995*	257	*1992*	18.5	*1993*	102	*1995*	69.2	*1988*
Grenada	$3,516	3	6	101,710	30	20	49.5	*1997*	367.7	*1997*	...	...	8.6	*1997*	...	...
Guam		5	2	159,350	9	6										
Guatemala	$1,545	2	6	11,992,000	60	43	93.3	*1997*	27	*1997*	...	...	13	*1997*	...	...
Guinea	$628	1	1	7,744,400	145	109	13	*1995*	55.7	*1995*	5.2	*1995*	...	...	...	...
Guinea-Bissau	$193	1	1	1,252,700	153	130	16.6	*1996*	109.4	*1996*	12.7	*1996*	0.9	*1996*	...	...
Guyana	$938	2	6	771,970	65	54	18.1	*1997*	84.2	*1997*	...	...	3.8	*1997*	...	...
Haiti	$344	1	6	8,286,500	102	79	8.4	*1992*	10.7	*1997*	...	...	1.2	*1992*	...	...
Honduras	$711	2	6	6,755,100	47	31	83.2	*1997*	25.5	*1997*	...	...	16.8	*1997*	...	...
Hungary	$5,735	3	4	10,166,000	15	8	357	*1998*	385	*1998*	18.6	*1998*	42.4	*1998*	47.3	*1998*
Iceland	$31,835	4	4	283,990	6	3	326	*1997*	865	*1998*	85.9	*1998*	105	*1997*	83.1	*1997*
India	$494	1	3	1,048,300,000	80	67	48	*1992*	45	*1992*	...	...	...	...	...	...
Indonesia	$1,060	1	2	211,720,000	60	33	16	*1994*	50	*1994*	26	*1994*	...	...	...	...
Iran, Islamic Rep.	$1,787	2	5	65,540,000	54	35	85	*1996*	259	*1996*			16	*1996*	11	*1996*
Iraq		2	5	24,256,000	40	107	55	*1998*	236	*1995*			5.7	*1998*	11.8	*1998*
Ireland	$30,157	4	4	3,877,600	8	6	219	*1998*	1593	*1998*	411	*1998*	46.2	*1998*	77.8	*1998*
Israel	$17,067	5	5	6,494,200	10	6	385	*1998*	613	*1998*	18.6	*1998*	116	*1998*	60.5	*1998*
Italy	$21,233	4	4	57,919,000	8	4	554	*1997*	296	*1989*	29.2	*1982*	64.4	*1997*	102	*1996*
Jamaica	$2,174	2	6	2,612,900	17	17	140.1	*1996*	64.5	*1996*	...	...	9	*1994*	...	...
Japan	$44,108	4	4	127,140,000	5	3	193.2	*1996*	744.9	*1996*	18.9	*1996*	68.6	*1996*	...	...
Jordan	$1,661	2	5	5,171,300	35	27	166	*1997*	296	*1997*			49	*1997*	77	*1997*
Kazakhstan	$1,893	2	4	14,795,000	42	81	353	*1998*	649	*1998*	56.1	*1998*	25.1	*1998*	65.7	*1994*
Kenya	$325	1	1	31,345,000	63	78	13.2	*1995*	90.1	*1995*	...	...	2.2	*1995*	...	...

Kiribati	$575	2	2	94,700	65	51	29.6	*1998*	235.8	*1998*	...	...	4.9	*1998*	...	...
Korea, Dem. Rep.		1	2	22,519,000	26	42	297	*1995*	180	*1995*	60	*1995*	...	...	...	...
Korea, Rep.	$14,280	4	2	47,640,000	8	5	136.1	*1997*	291.2	*1997*	...	...	33.4	*1997*	...	...
Kuwait	$13,345	5	5	2,103,900	14	9	189	*1997*	475	*1997*			26	*1997*	35	*1996*
Kyrgyz Rep.	$13,345	1	4	2,103,900	14	9	301	*1998*	750	*1998*	72.8	*1998*	27.4	*1998*	6.7	*1998*
Lao, PDR	$477	1	2	5,530,100	120	87	24.3	*1996*	107.7	*1996*	...	...	4.3	*1996*	...	...
Latvia	$3,100	3	4	2,335,000	14	17	282	*1998*	549	*1998*	33.2	*1998*	43.5	*1998*	...	...
Lebanon	$2,868	3	5	4,441,200	32	28	210	*1997*	100	*1997*			80	*1997*	50	*1997*
Lesotho	$577	1	1	2,086,700	102	91	5.4	*1995*	60.1	*1995*	47	*1995*	0.5	*1995*	...	...
Liberia	$199	1	1	3,295,100	157	157	2.3	*1997*	5.9	*1997*	4.3	*1997*	0.1	*1997*	...	...
Libya		3	5	5,533,900	34	16	128	*1997*	360	*1996*			13	*1996*	23	*1996*
Lithuania	$2,659	3	4	3,476,000	10	8	395	*1998*	884	*1998*	43.5	*1998*	61	*1998*	57.8	*1998*
Luxembourg	$56,513	4	4	443,500	7	5	272	*1998*	782	*1998*	21.9	*1998*	65.8	*1998*	69.4	*1998*
Macedonia, FYR	$2,418	2	4	2,038,000	32	22	204	*1998*	488	*1998*	66.6	*1998*	51.9	*1998*	14.9	*1998*
Madagascar	$217	1	1	16,437,000	103	84	10.7	*1996*	21.6	*1996*	10.7	*1996*	1	*1996*	...	...
Malawi	$162	1	1	10,743,000	146	114	...	...	...	...	...	...	...	...	...	...
Malaysia	$4,811	3	2	24,305,000	16	8	65.8	*1997*	113.3	*1997*	27.1	*1997*	8.6	*1997*	...	...
Maldives	$1,990	2	3	286,680	80	58	40	*1995*	113	*1995*	185	*1995*	...	...	...	...
Mali	$313	1	1	11,346,000	152	141	4.7	*1994*	13.1	*1994*	3	*1994*	0.1	*1994*	...	...
Malta	$10,098	5	5	397,000	9	5	261	*1998*	1100	*1993*	77.1	*1993*	35.8	*1998*	49.3	*1998*
Marshall Islands	$1,554	2	2	53,200	63	54	42.2	*1996*	148.8	*1996*	10.1	*1996*	5.1	*1996*	...	...
Mauritania	$513	1	1	2,828,000	120	120	13.8	*1995*	62.4	*1995*	10.1	*1995*	2	*1995*	...	...
Mauritius	$4,537	3	1	1,212,400	21	17	85	*1995*	232.9	*1995*	...	...	13.5	*1995*	...	...
Mexico	$3,713	3	6	100,920,000	37	24	186.4	*1990*	86.5	*1995*	...	...	65.9	*1990*	...	...
Micronesia Fed. Sts.	$3,713	2	2	100,920,000	37	24	57.3	*1999*	279	*1999*	0.8	*1999*	12.2	*1999*	...	...
Moldova, Rep.	$729	1	4	4,255,000	30	27	350	*1998*	874	*1998*	87.1	*1998*	41.2	*1998*	67.5	*1994*
Monaco		5	4	30,000	0	0	664	*1995*	1621	*1995*	35.7	*1995*	121	*1995*	218	*1995*
Mongolia	$440	1	2	2,448,500	77	61	243.3	*1998*	307.3	*1998*	...	...	13.5	*1998*	...	...
Morocco	$1,476	1	5	29,641,000	66	39	46	*1997*	105	*1997*			4	*1997*	11	*1996*
Mozambique	$229	1	1	18,438,000	143	125	...	...	...	...	...	...	...	...	...	...
Myanmar		1	2	48,895,000	91	77	29.7	*1999*	26.1	*1999*	22.1	*1999*	2.1	*1999*	...	...
Namibia	$2,412	2	1	1,823,200	65	55	29.5	*1997*	168	*1997*	116.5	*1997*	4	*1997*	...	...
Nauru*	$0			0	65	55	157	*1995*	588	*1995*	...	...	...	...	...	...
Nepal	$241	1	3	24,122,000	100	0	4	*1995*	5	*1995*	7.4	*1995*	...	...	...	...

Netherlands	$31,160	4	4	16,144,000	7	5	251	*1990*	902	*1991*	9.1	*1997*	47.1	*1996*	17.4	*1997*
New Zealand	$19,024	4	4	3,869,600	8	6	217.5	*1997*	771	*1997*	56.2	*1997*	39	*1997*	...	...
Nicaragua	$437	1	6	5,334,900	52	36	85.6	*1997*	91.9	*1997*	...	...	18.6	*1997*	...	...
Niger	$207	1	1	11,542,000	191	156	3.5	*1997*	22.9	*1997*	5.5	*1997*	0.2	*1997*	...	...
Nigeria	$248	1	1	132,780,000	114	110	18.5	*1992*	66.1	*1992*	52.4	*1992*	2.6	*1992*	...	...
Niue*	$0			0	114	110	130.4	*1996*	478.3	*1996*	87	*1996*	87	*1996*	...	...
Norway	$38,843	4	4	4,538,700	7	4	413	*1998*	1840	*1998*	59.1	*1998*	118	*1998*	57.1	*1998*
Oman	$6,277	3	5	2,539,400	25	12	133	*1998*	325	*1998*			9	*1998*	19	*1998*
Pakistan	$527	1	3	144,900,000	96	84	57	*1997*	34	*1996*			2.3	*1997*	34	*1996*
Palau	$5,435	3	2	19,900	0	24	110.4	*1998*	144	*1998*	5.6	*1998*	11	*1998*	...	...
Panama	$3,839	2	6	2,940,400	27	19	166.8	*1995*	144.1	*1997*	...	...	83.8	*1997*	...	...
Papua New Guinea	$856	1	2	5,373,300	79	70	7.3	*1998*	67	*1998*	...	...	2.7	*1998*	...	...
Paraguay	$1,703	2	6	5,510,000	30	26	109.8	*1997*	23.9	*1997*	...	...	22.8	*1997*	...	...
Peru	$2,404	2	6	26,749,000	58	30	93.2	*1997*	115.2	*1997*	...	...	39.6	*1997*	...	...
Philippines	$1,195	2	2	79,944,000	45	29	123	*1996*	418	*1996*	163	*1996*	52	*1996*	...	...
Poland	$3,762	3	4	38,626,000	19	8	236	*1997*	527	*1990*	64.3	*1997*	45.6	*1997*	53.5	*1997*
Portugal	$13,151	4	4	10,032,000	11	5	312	*1998*	379	*1998*	8.3	*1984*	33.3	*1998*	75.3	*1998*
Qatar		5	5	610,490	19	11	126	*1996*	289	*1996*			21	*1996*	51	*1996*
Romania	$1,611	2	4	22,355,000	27	19	184	*1998*	409	*1998*	39.6	*1998*	23.9	*1998*	7.3	*1998*
Russian Federation	$2,734	2	4	144,070,000	17	18	421	*1998*	821	*1998*	62.5	*1998*	32.2	*1998*	6.2	*1998*
Rwanda	$295	1	1	8,163,000	107	96	...	...	...	...	...	...	...	...	...	...
Samoa	$1,491	2	2	176,200	33	20	34.4	*1996*	155	*1996*	36	*1996*	4	*1996*	...	...
San Marino		5	4	30,000	0	4	252	*1990*	508	*1990*	26	*1990*	36.4	*1984*	52.1	*1990*
Sao Tome and Principe	$347	1	1	154,210	69	57	46.7	*1996*	127.4	*1996*	29.6	*1996*	5.2	*1996*	...	...
Saudi Arabia	$6,614	3	5	22,116,000	34	23	166	*1997*	330	*1997*			16	*1997*	21	*1997*
Senegal	$628	1	1	10,007,000	90	79	7.5	*1995*	22.1	*1995*	6.6	*1995*	1.2	*1995*	...	...
Seychelles	$5,715	3	1	83,590	17	13	132.4	*1996*	467.6	*1996*	394.6	*1996*	12.2	*1996*	...	...
Sierra Leone	$165	1	1	5,235,500	185	182	7.3	*1996*	33	*1996*	4.7	*1996*	0.4	*1996*	...	...
Singapore	$27,254	5	2	4,164,000	7	3	162.7	*1998*	492.1	*1998*	...	...	28.9	*1998*	...	...
Slovak Rep.	$27,254	3	4	4,164,000	7	3	353	*1998*	708	*1995*	39.3	*1995*	48.2	*1998*	33.8	*1998*
Slovenia	$12,326	5	4	1,992,000	8	4	228	*1998*	681	*1998*	32.7	*1990*	60.8	*1998*	36.3	*1998*
Solomon Islands	$527	1	2	443,300	29	20	14	*1995*	119	*1995*	...	...	7	*1995*	...	...
Somalia		1	1	9,390,800	133	133	4	*1997*	20	*1997*			0.2	*1997*	0.1	*1997*
South Africa	$4,183	2	1	43,580,000	45	56	56.3	*1996*	471.8	*1996*	...	...	17.8	*1996*	...	...
Spain	$17,885	4	4	41,180,000	8	4	424	*1997*	458	*1997*	16.2	*1988*	38.5	*1997*	113	*1997*

Sri Lanka	$891	2	3	18,968,000	19	17	36.5	*1999*	102.7	*1999*	41.9	*1999*	2.5	*1999*	4.5	*1999*
St. Kitts and Nevis	$6,125	3	6	45,980	30	20	117.1	*1997*	497.6	*1997*	...	...	19.5	*1997*	...	...
St. Lucia	$3,709	3	6	158,520	19	17	47.3	*1997*	263	*1997*	...	...	6.2	*1997*	...	...
St. Vincent and the Grenadines	$2,471	2	6	116,720	21	22	87.7	*1997*	238.6	*1997*	...	...	5.3	*1997*	...	...
Sudan	$356	1	1	32,365,000	75	65	9	*1996*	58	*1996*			0.7	*1996*	1.1	*1996*
Suriname	$1,057	2	6	422,570	35	26	25.2	*1996*	156.3	*1996*	...	...	0.9	*1996*	...	...
Swaziland	$1,528	2	1	1,088,200	77	106	15.1	*1996*	...	...	...	...	...	...	...	...
Sweden	$32,117	4	4	8,924,000	6	3	311	*1997*	821	*1997*	71.8	*1991*	152	*1997*	67.3	*1998*
Switzerland	$46,993	4	4	7,227,500	7	5	323	*1998*	779	*1990*	26.5	*1990*	48.8	*1997*	61.5	*1998*
Syrian Arab Republic	$801	2	5	17,005,000	37	23	144	*1998*	189	*1998*			74	*1998*	53	*1998*
Tajikistan	$453	1	4	6,315,700	98	0	201	*1998*	484	*1998*	65.4	*1998*	18.4	*1998*	12	*1998*
Tanzania	$204	1	1	35,181,000	102	104	4.1	*1995*	85.2	*1995*	44.8	*1995*	0.7	*1995*	...	...
Thailand	$2,986	2	2	61,613,000	34	24	24	*1995*	87	*1995*	...	...	...	...	...	...
Timor-Leste				753,000	0	85										
Togo	$324	1	1	4,766,600	88	79	7.6	*1995*	29.7	*1995*	10.4	*1995*	0.7	*1995*	...	...
Tonga	$1,750	2	2	101,160	25	17	44	*1997*	315.1	*1997*	31	*1997*	9.2	*1997*	...	...
Trinidad and Tobago	$5,466	3	6	1,318,300	21	17	78.8	*1994*	286.8	*1994*	...	...	8.4	*1997*	...	...
Tunisia	$2,580	2	5	9,788,300	37	21	70	*1997*	286	*1997*			13	*1997*	17	*1997*
Turkey	$2,942	2	4	69,626,000	61	36	121	*1998*	109	*1998*	64.4	*1998*	21	*1998*	33.6	*1998*
Turkmenistan	$1,787	2	4	5,545,400	80	69	300	*1997*	587	*1997*	78.4	*1997*	21.6	*1997*	33.5	*1997*
Tuvalu*	$0			0	80	69	30	*1999*	300	*1999*	90	*1999*	10	*1999*	...	...
Uganda	$367	1	1	23,395,000	100	79	...	...	18.7	*1996*	13.6	*1996*	0.2	*1996*	...	...
Ukraine	$1,038	2	4	48,717,000	18	17	299	*1998*	736	*1998*	58.7	*1998*	39	*1998*	46.7	*1997*
United Arab Emirates	$15,590	5	5	3,049,200	12	8	181	*1997*	341	*1996*			26	*1996*	81	*1996*
United Kingdom	$23,015	4	4	58,858,000	8	6	164	*1993*	497	*1989*	43.3	*1989*	39.8	*1992*	58.2	*1992*
United States	$31,977	4	4	288,370,000	9	7	279	*1995*	972	*1996*	...	...	59.8	*1996*	...	...
Uruguay	$5,463	3	6	3,381,000	20	14	370.3	*1996*	70	*1996*	...	...	126.3	*1996*	...	...
Uzbekistan	$525	1	4	25,391,000	53	52	309	*1998*	1011	*1998*	67.5	*1998*	24.4	*1998*	3.1	*1998*
Vanuatu	$1,176	2	2	205,570	52	34	12	*1997*	260	*1997*	...	...	...	...	...	...
Venezuela, RB	$2,978	3	6	25,093,000	23	19	236.3	*1997*	64.4	*1997*	...	...	57.1	*1997*	...	...
Viet Nam	$2,978	1	2	25,093,000	23	19	48	*1998*	56	*1998*	17.6	*1998*	...	...	...	...
Yemen, Rep.	$314	1	5	18,601,000	98	79	23	*1996*	51	*1995*			1.6	*1996*	4	*1996*

Zambia	$410	1	1	10,461,000	108	112	6.9	*1995*	113.1	*1995*	...	...	...	...	...	...
Zimbabwe	$522	1	1	12,967,000	53	76	13.9	*1995*	128.7	*1995*	28.1	*1995*	1.3	*1995*	...	...

***No WDI data**

Income level:		**Region:**	
	1 low income		**1** SSA
	2 lower middle income		**2** EAP
	3 upper middle income		**3** SA
	4 high income OECD		**4** ECA
	5 high income non-OECD		**5** MENA

Source: Courtesy of Christophe Kurowski