

Liberalisation of Trade in Health Services and the Implication for Africa's Health System

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Abstract

This paper explores the relationship between trade in health services, its liberalization, and Africa's health system with particular focus on Africa. Using a sample of African countries, a regression model link, health outcomes to health inputs and health policy variables were estimated to cover two separate periods- the pre- General Agreement in Trade in Services (GATS) (1990-1994) period and GATS period (1995-2006). The coefficients of the regression are then compared to determine the impact of GATS. Increasing the public health expenditure through additional budgetary provisions in African countries improves health only at the margin. The lack of agreement in the form of GATS limited the intensity of trade in health services. The non-significance of the trade in health services proxy variables during GATS period shows that health trade services impacts on Africa's health sector should be limited to commercial presence (Mode 3) and movement of health professionals (Mode 4) which are the channels through which health services trade is conducted in many African countries. Health services trade data are limited, hence proxy measure of health services were utilised in the paper and this might blur the expected impacts. The implication of the paper is for African countries to adequately participate in GATS as it involves trade in health services.

Key Words: Liberalisation, health system, mortality, services supply modes, WTO, general agreement in trade in services (GATS) JEL classification: F1,

Introduction

Many African countries in the eighties reviewed their development paradigm and adopted the Structural Adjustment Programme (SAP) basically to reform their ailing economies and restore sustained growth. SAP's main thrust included policies of liberalisation and commercialisation aimed particularly at increasing the role of the market in financing and providing health services, thus creating an environment of commercialisation also in the health sector, among others. Commercialisation of health has three dimensions; service provision by market relationships to those able to pay; associated investment in and production of services for cash income or profit; and health care finance derived from payment systems based on individual payment or private insurance (Koivusalo M. and Mackintosh, 2004). Simultaneously, the globalisation trend of the past two decades spurred in part by technological advancement and by national political and economic compulsions, affected the health care services despite its public good and non-commercial nature (Chanda, 2001). In the globalisation process, global conditions, institutions and policies affect national policies and economic decisions, while goods and services, capital, technology and information are exchanged across national borders in the globalising world.

One of the important institutions in the world's globalisation process is the World Trade Organisation (WTO). World Trade Organisation now covers not only trade in goods, but also trade in services, in trade related investments and intellectual property rights. Trade agreements at the WTO are binding on national governments and can impact on health and health services. In effect, policy-makers and stakeholders need to be cautious and take careful stock of national level capacity so as to take advantage of the benefits of trade in health services.

Trade in health services involves complex issues, such as health care reform, standardization of health system, health care accreditation, health insurance, human resource development and brain drain, language, cultural and even ethical and religious aspects. The growth of international trade in health services also has significant consequences for public health. Thus, while these issues pose new challenges a "win-win" outcome for all trade partners is possible if opportunities are appropriately utilised and threats internalised. The implication is that the relationship between trade and health is not simple, neither is it unidirectional. It is therefore

important to raise the issues to be understood and managed to promote health as well as to achieve coherence between trade and health policies and rules to health benefits. These include the potential conflicts and impacts of proposed international trade measures and agreements and protocols on a country's public health obligations, as well as the need for regular communication between health and trade officials.

This paper broadly explores the relationship between trade in health services, its liberalization, and Africa's health system with particular focus on Africa. It therefore provides an overview of Africa's health system, in terms of inputs, outputs and outcome indicators in section 2. The section also provides a brief review of the nature of international trade in health services, summarising it into the typology, associated opportunities and risks. The scant literature on trade in health services and its impacts is presented in section 3, while the paper's empirical analysis, including model articulation, estimations, results and discussion are contained in section 4. Section 5 summarises and concludes the paper.

An Overview of Africa's Health System and Trade in Health Services

Africa's Health System

According to the World Health Organisation, a health system is made up of the totality of the organizations, institutions and resources dedicated to actions which have the primary objective of improving health. Normally therefore, a country's or region's health systems includes public, private, traditional and informal sectors that provide health care service, and generate and spend resources toward financing health care provision. These are captured by health data and indicators for Africa source from the World Health Organisation. In terms of the inputs of resources into the health system, there are indications that majority of African economies or governments spend less than 10 percent of the gross domestic product on health. Only five countries, Malawi, Rwanda, Liberia Sao Tome and Principe and Burundi spent between 10 and 14% of gross domestic product on health in 2007. This may not be unconnected with war or post-conflict health reforms. The health component of total government spending could be regarded as a small percentage, with most African countries spending between less than 5% and 10% on health while very few recorded between 15% and 20% of total government spending on health. Human capital input in the African health sector depicts a very poor situation with regard to the

indicator of number of physicians per 100,000 populations. Only South Africa, Mauritius and Seychelles have numbers that range between 50 and 120 physicians per 100,000 people in 2007 (Olaniyan, 2008). The financial resource input into the health system also depicts a dismal picture of health sector financing, with the private sector contribution to total national health expenditure being very high at over 40% for majority of the countries. The share of private expenditure in total health expenditure is above 60% for many African countries including such big African economies as Nigeria, South Africa, Cameroun, Egypt, Morocco and some smaller nations namely Guinea, Burundi, Sierra Leone, Togo and Liberia. Africa's poorest indicator is the fact that health insurance is highly underdeveloped as out-of-pocket expenditure as a percentage of private expenditure remains very high, ranging between 40% and 100% for most of the African countries. Specifically, only Namibia, Malawi, South Africa and Botswana have out-of-pocket-expenditure as a percentage of private expenditure slightly above 20%. Mozambique, Swaziland and Rwanda have out-of-pocket expenditure share of about 40%. The extreme cases of countries which have out-of-pocket expenditure share of 100% include Guinea, Mali, Cape Verde, Angola, Congo, Eritrea, Gabon, Libya, Mauritius and Sudan. Nigeria, Egypt, Cameroun and Central African Republic are in the same category of countries with about 80% out-of-pocket expenditure share.

In view of the performance of Africa's health system using these few indicators, the question that normally arises is whether trade in health services in form of cross border supply, consumption abroad, commercial presence and movement of natural persons augurs well for Africa or not. This is the subject matter in section 4. Meanwhile, in the subsection that immediately follows, the trend of indicators that relate to trade in health services is analysed to give an overview of the characterization of the data and a tentative expectation regarding the relationship between health trade in health services and health system sector performance.

Trade in Health Services in Africa

Health services under the GATS include general and specialized services of doctors, deliveries and related services, nursing services, physiotherapeutic and paramedical services, all hospital services, ambulance services, residential health facility services, and services provided by medical and dental laboratories. Professional services provided by doctors and nurses are separately treated from hospital

services. However, GATS does not cover all health services. It excludes services which are provided “in the exercise of governmental authority”, which according to GATS Article 1:3 (c) refers to services that are supplied neither on a commercial basis nor in competition. A case in point of excluded activities is the provision of medical and hospital treatment directly through the government, free of charge. However, health services which are provided directly by the private sector or by the public sector on a commercial basis are subject to negotiation and commitments under the GATS.

There are many provisions under GATS which address the main regulatory measures governing trade in health services. These regulations include qualification and licensing requirements for individual health professionals, approval requirements for institutional suppliers, and rules and practice governing reimbursement under mandatory regulations to be administered in a reasonable, objective and impartial manner and not be more burdensome than necessary to ensure the quality of the service; and Article VII on recognition which requires members not to accord recognition in a manner which would constitute a means of discrimination or a disguised restriction on trade.

The WTO General agreement on Trade in Services (GATS) regulates trade in services, including in health services (see Table 1). Generally countries can if they wish, liberalise their health sectors, but are not obliged to do so. Countries are under no legal obligation to make commitments in services under GATS. However, when a country decides to commit health and health related services under GATS, they make specific obligations to liberalise the sector and limit national authority to regulate services. GATS is the multilateral legal framework through which WTO members will approach the progressive liberalization of trade in services, including health-related services. It defines four ways (called *modes*) of international trading in services. Under GATS negotiations, countries make or request specific commitments relating to market access in various services sectors, including health services. For the health sector, GATS applies only to health-related services provided for profit; it excludes public-provided services not available on a commercial basis or in competition with others.

Table 1: Health Issues and Relevant World Trade Organisation Agreements

WTO rules	SPS = sanitary and phytosanitary measures	TBT = Technical barriers to trade	TRIPS = Trade related Intellectual property rights	GATS = General agreement on Trade in services
Health Issues	X	X	X	X
Infectious disease control	X	X		
Food safety	X			
Tobacco control		X	X	X
Environment	X	X		
Access to drugs			X	
Health services				X
Food security	X			
Biotechnology	X	X	X	
Information technology			X	
Traditional knowledge			X	

Source: Drager 2004

Mode 1: Mode 1 is called cross-border supply (of health services). Under this mode, *consumer remains in home territory. Service crosses national border. Supplier is located in a different country. The main components of this mode include telehealth and telemedicine.* Telehealth is the “integration of telecom systems into the practice of protecting and promoting health” while telemedicine is the incorporation of these systems into curative medicine. These methods are growing in importance. Today, global demand for telehealth services is estimated to be at about \$1.25 trillion, which includes direct clinical services of \$804.2 billion, professional back up services of \$22.5 billion, consumer health information related services of \$21.6 billion, continuing professional education services of \$3.9 billion, and management of health care delivery services of \$235.5 billion. Countries are engaged in a variety of telehealth services such as telepathology, teleradiology, and telepsychiatry and many cross-border telemedicine initiatives have emerged. For instance, telediagnostic (Chanda 2001). This mode is more prevalent among developed countries where there is adequate infrastructure to support it.

Mode 2: Mode 2 is the consumption (of health services) abroad. It is a situation where the *consumer moves outside home territory and consumes*

services in another country. It also refers to the movement of consumers to the country providing the service for diagnosis and treatment. This trade is often driven by differences in cost, quality, and availability of treatment across countries as well as factors such as natural endowments, existence of alternative medicines and treatment procedures, long waiting lists for treatment in the source country, and cultural, linguistic, and geographic proximity between sending and receiving countries. This mode is not limited to any country but can occur among developed and developing, as well as across developed and developing countries. It is common for instance for affluent patients in developing countries to seek specialized high quality treatment overseas in developed country hospitals or in neighbouring developing countries with superior health care standards. It is also common for persons in developed countries to seek quality treatment at a fraction of the cost in developing countries, or to seek alternative medicines and treatments and take advantage of natural endowments in developing countries. Another part of this trade consists of movement of health professionals and students for receiving medical and paramedical education and training abroad.

Mode 3: Mode 3 represents commercial presence—i.e. commercial and private service provision of health services. *Service is supplied through a commercial presence of the foreign producer in the consumers' home territory. This includes any type of business or professional establishment; constitution, acquisition or maintenance of a branch or representative office.* Globalisation has made it possible for many foreigners to establish hospitals, clinics, diagnostic and treatment centres, and nursing homes in host countries different from their own countries. Countries have become increasingly open to foreign direct investment in order to upgrade and modernize their health care infrastructure and training facilities. In certain cases, this mode of trade takes place when health care companies in developed and some developing countries are also increasingly engaging in joint ventures, alliances, and management tie-ups. Such ventures typically involve acquisition of facilities, management contracts, and licensing arrangements with some degree of local participation to ensure access to certified and adequately trained local persons and to ensure local contacts and commitment.

Mode 4: Mode 4 is the presence of natural persons which in most cases happens through migration of health workers. Here, *an individual moves into the territory of the consumer to provide the service (self-employed or employee,*

non-permanent). The health workers include doctors, specialists, nurses, paramedics, midwives, technicians, consultants, trainers, health management personnel, and other skilled and trained professionals. In fact, this mode along with consumption abroad constitutes the bulk of trade in health services today. The factors driving cross-border movement of health service providers include wage differentials between countries, search for better working conditions and standards of living, search for greater exposure, training and improved qualifications, and demand-supply imbalances between receiving and sending countries in the health sector. In the nursing profession, mobility is particularly important, given the fact that nursing personnel constitute 70 per cent of health care staff and 80 per cent of direct patient care in some countries such as Indonesia (Chanda, 2001).

Trade in health services via movement of persons mainly consists of exports of health providers from developing to developed countries and between developing countries in certain parts of the world. An estimated 56 per cent of all migrating physicians flow from developing countries to developed countries, while the former receive only 11 per cent of all migrating physicians. The emigration percentage is even higher for nurses. The extent of movement of health personnel is evident from a few examples. For instance, in Ethiopia, 55.6 per cent of pathology graduates left the country between 1984- 94 (book) while in Ghana, only 22 of 65 medical graduates remained in the country (Kaiser, 2005).

Table 2 shows certain indicators relating to services trade which could give a status of trade in health services. Ideally, data on trade in health services should directly measure Mode 1: telehealth services such as telepathology, teleradiology, and telepsychiatry and telediagnostic; Mode 2: medical tourism, medical and paramedical education and training abroad; Mode 3: foreign direct investment for the establishment of hospitals, clinics, diagnostic and treatment centres, nursing homes, health care infrastructure and training facilities; and mode 4: movement of qualified health persons such as doctors, specialists, nurses, paramedics, midwives, technicians, consultants, trainers, health management personnel, and other skilled and trained health professionals.

Table 2: Indicators of Services Trade in Africa

[1] Country	[2] International migration stock (% of population), 2005	[3] Workers' remittances and compensation of employees, received (% of GDP)	[4] Service balance(BoP, current US\$ 2004	[5] Country	[6] International migration stock (% of population), 2005	[7] Workers' remittances and compensation of employees, received (% of GDP)	[8] Services balance(BoP, current US\$) 2004
Algeria	0.74	1.91	..	Liberia	1.53	..	..
Angola	0.35	..	-4479961817	Madagascar	0.34	0.06	-82565983.24
Benin	2.07	1.47	-71522026.25	Malawi	2.16	0.05	..
Botswana	4.54	1.21	-44623211.71	Mali	0.34	2.92	-290661395.7
Burkina Faso	5.84	0.97	..	Mauritania	2.15	0.11	..
Burundi	1.33	..	-58087763.76	Mauritius	1.67	3.42	432319241.3
Cameroon	0.84	0.07	..	Mozambique	2.05	0.86	-275835548.6
Cape Verde	2.21	13.94	43118426.68	Namibia	7.05	0.26	97374638.63
Central African Republic	1.89	..	..	Niger	0.89	1.76	-168823707.3
Chad	4.48	..	..	Nigeria	0.74	3.36	-2637238451
Comoros	11.19	3.10	..	Rwanda	1.34	0.98	-137160000
Congo, Dem. Rep.	0.94	..	..	Sao Tome and Principe	4.79	1.42	..
Congo, Rep.	7.19	0.22	-819633637.7	Senegal	2.80	7.68	-28081443.45
Cote d'Ivoire	13.06	0.98	-1269898335	Seychelles	5.84	1.59	110770388
Equatorial Guinea	1.15	..	..	Sierra Leone	2.16	0.17	-30951079.02
Eritrea	0.33	..	..	Somalia	3.42	..	..
Ethiopia	0.78	1.56	47171590.66	South Africa	2.36	0.27	-646194951.8
Gabon	17.67	0.07	-782805018.6	Sudan	1.76	3.69	-1020400000
Gambia, The	15.28	12.57	27417293.27	Swaziland	4.02	2.97	-168216366.3
Ghana	7.55	0.92	-356160000	Tanzania	2.07	0.13	151890000
Guinea	4.32	1.28	-189873891.8	Togo	2.98	6.72	89281386.04
Guinea-Bissau	1.21	9.30	36622290.97	Uganda	1.80	5.46	307570834.5
Kenya	1.01	2.80	617704506	Zambia	2.36	..	..
Lesotho	0.33	22.55	-32181466.3	Zimbabwe	3.93	..	..

World Bank Development Indicators, CDR0M, 2008; Note: '..' = not available

These data have not been made widely available and it is doubtful whether Africa disseminates such data at all when collected. The indicators in Table 3 are thus proxies for all health services trade (columns 4 and 8) and Mode 4 (columns 2, 3, 6 & 7). What the data indicates and is also expected from direct health data if available is that most African countries record deficits in their health services account whereas they have high migration of health professionals abroad as well as some remittances from health workers resident abroad. Evidence has shown that sub-Saharan Africa's medical graduates who work in the USA and Canada as a

proportion of medical graduates who trained in SSA averaged about 10% in 2002. For countries like South Africa, Ethiopia, Uganda, Ghana and Liberia, the proportion of the medical graduates who trained in these countries but work in the USA and Canada is above average, with Ghana and Liberia recording between 30% and 40%.

Table 3: Country Representation of Overseas Trained Nurses in the United Kingdom

COUNTRY	1998-99	1999-00	2000-01	2001-02	2002-03	Average Annual Growth rate (%) (1998 – 2003)	2008
South Africa	599	1460	1086	2114	1480	19.8	3657
Nigeria	179	208	347	432	524	24.0	1534
Zimbabwe	52	221	382	473	493	56.8	4674
Ghana	40	74	140	195	255	44.8	1626
Kenya	19	29	50	155	152	51.6	1216
Zambia	15	40	88	183	135	55.2	1215
Mauritius	6	15	41	62	60	58.5	600
Malawi	1	15	45	75	57	124.5	3249
Botswana	4	-	87	100	42	60.0	441

Source: Kategekwa (2008)

Concern with the benefits in liberalised trade in health services has dominated the research activities of many scholars over the past years. Explanations for benefits in trade in health services have tended to be driven by theories that place the benefits on the contribution to GDP in most countries; providing jobs, inputs and public services for the economy. Trade in services can improve economic performance and provide a range of traditional and new export opportunities.

Rudolf & Antonia (2001) in their work opined that the potential for trade in health services has expanded rapidly in recent decades. More efficient communication systems have helped to reduce distance-related barriers to trade; rising incomes and enhanced information have increased the mobility of patients; and internal cost pressures have led various governments to consider possibilities for increased private participation. As yet, however, health services have played only a modest role in the General Agreement on Trade in Services (GATS). It is possible that members of the World Trade Organization have been discouraged from undertaking access commitments by the novelty of the agreement, coordination problems between relevant agencies, widespread inexperience in concepts of services trade, a traditionally strong degree of government involvement in the

health sector, and concerns about basic quality and social objectives. However, fifteen years have passed since GATS entered into force, allowing hesitant administrations to familiarize themselves with its main elements and its operation in practice.

Findings by Massimiliano, Ellis and Dirk (2008), suggest that developing countries are increasingly important players in the international health services markets. Examples include countries like India, South Africa, China and Brazil in medical tourism, exploiting their cost advantage and quality of part of their health sector, and the Philippines in nursing services trade via temporary migration of health personnel. Filipino nurses constitute 76% of foreign nurse graduates in the United States. While these exports may become an important share of a country's foreign exchange earnings, it is important that development of a trade strategy complements the primary objective of government to provide a universal coverage of health care to local communities. Thus domestic regulation could be welfare enhancing even if it were highly restrictive to trade. Gewertz and Amado (2004) opened a discussion on trade and health by examining the ethical implications of the WTO's Agreement on Trade-Related Intellectual Property Rights and its impact on drug availability in poor countries. Business ethicists, however, have not yet grappled with the broader implications free trade agreements may have for democracy in rich and poor nations alike.

Similarly, studies in trade related services by Chantal, Mickey and Hoeven (2009) concluded that even though trade liberalisation seems to have positive effects on economic growth, it is not sufficient to boost growth. In many countries, trade reforms have not translated into enhanced economic expansion because complementary policies are needed. Trade liberalisation and openness are associated with greater wage inequality and raised economic insecurity. Trade liberalisation has facilitated the availability of highly processed, calorie-rich, nutrient-poor foods in developing countries, but further research is needed to better understand the effects of trade on unhealthy diets. Policy makers and health professionals need to be aware that the global economy affects the health of populations and understand how risks associated with trade liberalisation can be mitigated.

Andrew (2000) in his study concluded that, while opening an economy to trade may not provide the desired quick fix, the removal or

relaxation of quantitative import and export restrictions and lowering of tariffs would result in increased exports and growth. The dawn of a global economy ushered in by universal trade liberalization, therefore, need not spell catastrophe for African economies as is widely feared. Grossman and Helpman (1991) also pointed out that one of the key inputs to a country's innovation system is human capital, and the amount of human capital allocated to innovation is closely reflected in technological change in the economy. Trade can constrain innovation and growth if it tends to shift human capital from research and development activities to other sectors of the economy to meet the human capital needs of direct production activities. In countries with scarce skilled human capital, this would drive human capital away from research and development, reducing innovation and growth.

Studies carried out by Robert (2003) indicated that the world is currently experiencing a surge of international regulations aimed at limiting the development policy options of developing country governments. Of the three big agreements coming out of the Uruguay Round - on investment measures (TRIMS), trade in services (GATS), and intellectual property rights (TRIPS) -the first two limit the authority of developing country governments to constrain the choices of companies operating in their territory, while the third requires the governments to enforce rigorous property rights of foreign (generally Western) firms. Together the agreements make comprehensively illegal many of the industrial policy instruments used in the successful East Asian developers to nurture their own industrial and technological capacities and are likely to lock in the position of Western countries at the top of the world hierarchy of wealth.

The literature on trade in health services is polarized between a 'trade' faction, which emphasizes the potential for developing countries to increase foreign exchange earnings, with limited (and determinedly optimistic) consideration of the implications for domestic health systems; and a 'health systems'¹ faction, which sees grave dangers to health systems, which it assumes to outweigh any economic gains, generally without any explicit consideration of economic effects.

The 'trade' literature is epitomized by Zarilli (2002): Developing countries have the potential to become exporters in (the health services) sector.... Further trade liberalization of the health sector can lead to

improved health systems in developing countries by providing additional financial resources, exposing health professionals from developing countries to new techniques, and providing them access to higher qualifications. Also, improvements can follow from introducing innovative management systems in developing countries, upgrading the quality of the health treatments they can provide, especially in the rural areas, and strengthening foreign and domestic competition. All of these would be good reasons for liberalizing the sector.

While Zarilli acknowledges 'obstacles that need to be removed to reach those results', these are obstacles to trade taking place rather than to trade producing the benefits he describes. The 'health systems' side of the argument focuses primarily on the implications of the GATS rather than of trade in health services per se. (There is a sense almost that the health side of the debate, as mostly health specialists rather than economists, has conceded the argument on the latter.) This idea is exemplified by Pollock and Price (2000, 1999) The new criteria proposed at the WTO threaten some of the key mechanisms that allow governments to guarantee health care for their populations by requiring governments to demonstrate that their pursuit of social policy goals are least restrictive and least costly to trade.¹

Even the 'trade' literature generally fails to consider the broader economic effects of increased health service exports, regarding increased foreign exchange earnings as an end alone, without considering indirect effects or the distribution of costs and benefits. It also frequently blurs the distinction between exports and imports of health services, appealing to the potential foreign exchange earnings from exporting health services (e.g. Adlung and Carzaniga, 2001; WHO/WTO, 2002), but rarely mentioning the foreign exchange costs of importing them, even though a country's commitments under the GATS affect its imports and not its exports.

The extent of the literature is limited relative to the potential importance of the issue and the impact of policy decisions under consideration. It is largely speculative in nature, in terms of both economic and health systems effects; and it is mostly written by nationals of

¹Health systems have been undergoing significant changes in recent years yet these changes are often not based on robust evidence. A greater understanding of how health systems do, and do not, function is a fundamental prerequisite to improving health in developing countries. Policies to scale up add a further dimension to the need to understand health systems. Global factors are increasingly influencing the functioning of the health sector and require policy attention.

developed countries or of the few developing countries for which health service exports are economically important and, overall, officially welcomed (most notably India). Most of the available country studies (except on migration of health professionals) are of these countries (e.g. those in UNCTAD/WHO, 1998; Drager and Vieira, 2002), leading to a relative neglect of the effects of importing health services. They are generally descriptive of the current and possible future nature and extent of trade, and of regulations affecting such trade, with at most partial and anecdotal evidence of its effects rather than rigorous analysis.

Researchers have adopted many different empirical methods to analyse the linkages between trade liberalisation in health services and development of health system. These different methodologies have their respective strengths and weaknesses, and can be considered to follow conceptual approaches. McCulluch and Calendrino (2001) identified three main empirical approaches used by various researchers in exploring these links; (i) the descriptive or qualitative approach, (ii) the data-based approach and (iii) the modelling approach. In sum, most of the empirical works for the past years have concentrated on cross-country and panel data regression analyses. Similar studies on trade liberalisation (Samuel 2009) adopted the time series approach in which a short-run dynamic equation using the Error Correction Model (ECM) and using the co-integrating test to ascertain or corroborate the results of the empirical study was adopted.

As affirmed by Collier *et al.*(1997), "There are three ways of evaluating the impact of liberalisation of trade in health services on economic performance: (i) Computable General Equilibrium (CGE) modelling, it has the virtue of allowing a systematic evaluation of alternative scenarios; (ii) cross-section analysis, it involves comparing the experience of countries that have undergone liberalisation with those that have not; and (iii) time-series analysis; depending on the availability of data, this is potentially the most fruitful; this is essentially a before and after methodology, that is, it tracks the series concerned up to liberalisation and after liberalisation...". However, in recent years, the use of frontier models is becoming increasingly widespread for a variety of reasons. First, the notion of a frontier is consistent with the underlying economic theory of optimising behaviour. Second, deviations from a frontier have a natural interpretation as a measure of the efficiency with which production units pursue their behavioural objectives.

Consequently, Hussein (2005) posits that globalization represents a challenge to health systems, both in the Eastern Mediterranean Region of the World Health Organization and worldwide (especially in Africa). The opening up of trade in health services will create new opportunities for health systems while also putting pressure on them and creating new challenges for them. Health systems are expected to benefit in particular from developments in information technology, which will facilitate access to up-to-date biomedical technology and skills for large segments of population. At the same time, concerns have been expressed about the potential negative impacts of free trade in health services on access to essential health services, on the existing brain drain of qualified professionals from the region and on overall equity with respect to health care. Assessing trade in health services is a relatively new area that has only recently caught the attention of public health professionals and health policy-makers alike. Country studies on assessing trade in health services require a valid and reliable methodology that will allow the possible impact of international trade on access, quality, equity and efficiency of health services to be estimated. This section addresses such a need.

However, based on the study by the WHO (2005), a better methodology in assessing trade in health services is in the approach where the four modes of trade in health services are used to analyze the study, these modes of trade in health services are as follows; Mode 1; Cross-border supply of health services, Mode 2; Assessment of consumption of health services in other countries, Mode 3; Assessment of commercial presence of foreign health provider, and Mode 4; Assessment of movement of health professionals to other countries. Azza (2006) used a methodology based on a country case-study in which he investigated trade in health services in terms of its impact on health services as well as on the determinants of health (including poverty and economic growth). He was of the opinion that focus should be on obtaining evidence that trade liberalization is good for health and that in the absence of such evidence it would be best for countries to adopt a “wait and see” approach to GATS. However, it was pointed out that trade in health services was already happening before GATS and therefore there is no new impact issue. A key question to address, it was suggested, is whether “open” or “non-open” health systems perform better. To measure this, indicators are required (by Mode) for openness and performance. There is a need to focus on the impact in specific areas of concern; in this regard, a country-focus on different areas could be useful. In conclusion, some of the empirical work for the past

fifteen years have concentrated on cross-country, country-case studies, panel data regression and the use of time series methodology. Only a few studies have employed the OLS methodology and recently, the computable general equilibrium (CGE) techniques.

Methodology

The methodological and empirical literature suggests that the impact of services trade liberalisation can be modelled by assessing the impact of that liberalisation on economic growth.

Since this paper's interest is on sector performance, we specify an empirical equation that borrows from the literature of health outcomes determinants (e.g. Esrey et al. 1991, Waldmann 1992, Anand and Ravallion 1993, Pritchett and Summers 1996, Filmer and Pritchett 1999, Easterly 1999, Galiani et al. 2002 and Wang 2002) which link health outcomes such as child mortality, maternal mortality, and morbidity to health inputs and health policy variables including income, income distribution, income growth, nutritional status, GDP per capita, female illiteracy rates, ethnolinguistic fractionalization, country predominant religion, rural share of the population, vaccination, infrastructure (access to electricity, improved sanitation and safe water, hygiene, and transport). We then augment the health outcome equation with trade in health services variables by specifying an equation of the form:

$$H_i = f(X_i, T^H_i, u_i) \quad (1).$$

Where H is a vector of health outcome variables of an African country i , X is a vector of health input variables and T^H is composed of the variables measuring the four modes of international health services supply namely telehealth services (Mode 1); medical tourism, medical and paramedical education and training abroad (Mode 2); foreign direct investment for the establishment of hospitals, clinics, diagnostic and treatment centres, nursing homes, health care infrastructure and training facilities (Mode 3); and movement of qualified health persons such as doctors, specialists, nurses, paramedics, midwives, technicians, consultants, trainers, health management personnel, and other skilled and trained health professionals (M4). In explicit terms, equation 1 is specified as:

$$\ln H_i = \alpha_i + \beta_1 \ln RY_i + \beta_2 \ln INFR_i + \beta_3 \ln HI_i + \beta_4 \ln T^H_i + e_i \text{ ----- } (2).$$

Where H_i is a vector of health outcome variables which are life expectancy, infant mortality, and under-5 mortality; RY_i is the income variable; HI_i is health input vector comprising nutritional status, illiteracy rates, vaccination and number of physicians; $INFR_i$ is a vector of infrastructure variables concerning access to electricity, road infrastructure, sanitation, and safe water, transport, and rural share of the population; while TH_i is a vector which represents telehealth, consumption of medical services abroad, foreign direct investment in host country health sector, and migration of health personnel abroad.

Variable Description

The variable measurements are as follows: life expectancy is life expectancy at birth, infant mortality is infant mortality rate (per 1,000 live births), and under-5 mortality is per 1000; income is measured by real GDP per capita; nutritional status is measured by malnutrition prevalence, height for age (% of children under 5), illiteracy rates is literacy rate, adult total (% of people ages 15 and above), vaccination is proxy by DPT and measles immunisation (% of children ages 12-23 months), number of physicians is physicians (per 1,000 people) and health expenditure, public (% of GDP); electricity is electric power consumption (kWh per capita), sanitation is improved sanitation facilities (% of population with access), and safe water improved water source (% of population with access), Roads, paved (% of total roads), and urbanization is proxy by urban population growth (annual %). The proxy for telehealth is International voice traffic (out and in, minutes), consumption of medical services abroad is proxy by health expenditure, private (% of GDP), and migration of health personnel abroad is measured by total international migration stock.

A Priori Expectations: Income, number of physicians, immunization, literacy rate, electric power consumption, improved sanitation, improved access to water, and public health expenditure are expected to be negatively related to infant mortality and under-5 mortality, while it is positively related to life expectancy at birth. In terms of the trade variables, telehealth variable is expected to be negatively related to all the health outcomes since provision of consultation to foreign patients deprives domestic patients of the time the physician provides the telehealth services.

Data Requirement and Sources

Though consumption of health services abroad can be directly captured by medical tourism the paucity of data necessitates the proxy of private share of health expenditure. The higher the private share of health expenditure, especially in developed countries, the higher the consumption of medical services abroad, and the higher the diversion of resources to service foreign national. Hence, this proxy is expected to be negatively related to life expectancy and positively related to infant mortality and under-5 mortality. International migration which proxy for movement of health personnel abroad is expected to relate negatively to life expectancy and positively with infant and under-5 mortality.

In the implementation of the OLS estimation, because of scanty data for the earlier years for many of the African countries, averages were taken to cover two separate periods 1990-1994 representing the pre-GATS period and 1995-2006 covering the GATS period. Data and estimation for each period were then treated as a cross-section and the coefficients compared to determine the impact of GATS. All variables except the ones expressed in rates are in logarithmic form while the equation is estimated in double logarithm.

Results and Discussion

Table 4 presents the outcome of the estimation of the determinants of life expectancy, infant mortality and under-5 mortality rates of African countries prior to the signing of the GATS in December 1994. From the life expectancy equation, five traditional variables are of the right sign and significant in accordance with a priori expectation. These are the public health expenditure, number of physicians, malnutrition prevalence, literacy rate and road infrastructure. None of the proxies for trade in health services variable is significant. Similarly, in the infant mortality equation, only the number of physicians, literacy rate, and electricity infrastructure variables are significant and rightly signed. Again, none of the proxies for trade in health services variable is significant. The malnutrition prevalence variable is significant and rightly signed in the under-5 mortality equation rather than the electricity infrastructure variable. The proxies for trade in services are expectedly not significant also. The insignificance of the trade in health variable is assumed to be as a result of lack of agreement in trade in health services which implies that though there could have been some trade in

health services taking place, the scale would at best be insignificant as there was not in existence any systematic multilateral framework that guides the orderly development of such trade.

After the signing of the GATS in 1995, global trade in health services was expected to increase even though only few African countries committed their health sector. The impact on Africa's health sector is expected to be felt more. Table 5 provides the estimation of the determinants of life expectancy, infant mortality and under-5 mortality during the GATS period. The first observation in this period's result is that fewer traditional variables are significant while the trade in health services variables are not significant, at all as is the case with their non-significance in the pre-GATS period though their associated coefficients are larger than during the pre-GATS period.

Nurses who trained in sub-Saharan Africa and migrated to developed countries have also been documented in the literature. A synopsis of the trend of selected countries which have their nurses in the United Kingdom is indicated in Table 4 for the period 1998-2003. The average annual growth rate of the number of nurses of African origin that work in the UK is the highest for Malawi, followed by Botswana, Mauritius, Zimbabwe and Kenya. Using the average annual growth rate to project the number of nurses trained in Africa in the UK, by 2008, Zimbabwean-trained nurses in the UK could reach over 4000, while for each of South Africa and Malawi they could be over 3000.

Table 4: Determinants of Health Outcomes in Pre-GATS Period (1990-1994)

Independent variables	Life expectancy at birth	Infant mortality rate	Under-5 mortality rate
	0.006	0.011	0.015
GDP per capita (constant 2000 US\$)	(0.5)	(0.46)	(0.59)
Health expenditure, public (% of GDP)	0.591 (4.8)***	-0.136 (-0.59)	0.031 (0.13)
Immunization, DPT (% of children ages 12-23 months)	0.000 -(0.06)	-0.004 (-1.1)	-0.002 (-0.45)
Immunization, measles (% of children ages 12-23 months)	0.000 -(0.06)	0.003 (0.71)	0.001 (0.13)
Physicians (per 1,000 people)	0.073 (2.91)***	-0.063 (-1.33)	-0.112 (-2.39)
Malnutrition prevalence, height for age (% of children under 5)	-0.004 (-2.17)***	0.001 (0.41)	0.007 (1.98)
Literacy rate, adult total (% of people ages 15 and above)	0.008 (3.1)***	-0.011 (-2.28)**	-0.021 (-4.33)
Electric power consumption (kWh per capita)	0.001 (0.15)	-0.023 (-2.2)**	-0.015 (-1.36)
Improved sanitation facilities (% of population with access)	-0.007 (-2.31)**	-0.005 (-0.89)	0.007 (1.2)
Improved water source (% of population with access)	0.003 (1.19)	0.005 (1.12)	-0.003 (-0.54)
Urban population growth (annual %)	-0.003 (-0.4)	-0.001 (-0.04)	0.012 (0.76)
Roads, paved (% of total roads)	0.002 (2.94)***	-0.001 (-0.52)	-0.002 (-1.81)
International voice traffic (out and in, minutes)	0.006 (1.78)*	-0.007 (-1.15)	-0.008 (-1.17)
Health expenditure, private (% of GDP)	(dropped)	(dropped)	(dropped)
	-0.005	0.022	0.049
International migration stock, total	(-0.29)	(0.69)	(1.47)
_cons	1.351 (14.37)	1.246 (7.0)	1.258 (6.74)
Adjusted R ²	0.794	0.577	0.7533
Number of observation	50	50	50
F (14, 35)	14.450	5.79	11.69

Source: Authors' estimation. Absolute value of z statistics in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%. All variables in log except the assets dummies. _cons represent the constant term.

Specifically, number of physicians and road infrastructure are the two statistically significant variables in the life expectancy equation, while DPT immunization and number of physicians are the statistically significant variables in the infant mortality equation. In the under-5 mortality equation, income, DPT immunization, improved access to sanitation, and road infrastructure variables are statistically significant.

Table 5: Determinants of health outcome in GATS period (1995-2006)

	Life expectancy at birth	Infant Mortality rate	Under-5 Mortality rate
GDP per capita (constant 2000 US\$)	0.044 (0.88)	-0.112 (-1.56)	-0.236 (-3.12)***
Health expenditure, public (% of GDP)	-0.015 (-0.66)	0.001 (0.04)	0.013 (0.37)
Immunization, DPT (% of children ages 12-23 months)	0.003 (1.12)	-0.008 (-2.33)**	-0.009 (-2.39)**
Immunization, measles (% of children ages 12-23 months)	-0.002 (-0.78)	0.004 (1.1)	0.005 (1.24)
Physicians (per 1,000 people)	0.086 (2.13)**	-0.141 (-2.42)**	-0.072 (-1.17)
Malnutrition prevalence, height for age (% of children under 5)	-0.003 (-0.65)	0.004 (0.52)	0.004 (0.47)
Literacy rate, adult total (% of people ages 15 and above)	0.004 (0.72)	0.006 (0.75)	-0.001 (-0.1)
Electric power consumption (kWh per capita)	-0.009 (-1.19)	-0.005 (-0.42)	0.009 (0.75)
Improved sanitation facilities (% of population with access)	-0.003 (-0.3)	0.005 (0.37)	-0.001 (-0.04)
Improved water source (% of population with access)	-0.018 (-1.82)*	0.021 (1.48)	0.034 (2.23)**
Urban population growth (annual %)	0.001 (0.1)	-0.006 (-0.41)	0.007 (0.48)
Roads, paved (% of total roads)	0.004 (3.33)***	-0.001 (-0.85)	-0.007 (-3.91)***
International voice traffic (out and in, minutes)	0.003 (0.68)	-0.008 (-1.2)	-0.003 (-0.48)
Health expenditure, private (% of GDP)	-0.019 (-0.67)	0.048 (1.14)	0.063 (1.43)
International migration stock, total	0.017 (0.62)	-0.033 (-0.82)	-0.044 (-1.04)
_cons	1.330 (5.97)	1.628 (5.04)	2.220 (6.51)
Adjusted R2	0.596	0.683	
Number of observation	50.000	50	
F (14, 35)	5.820	8.02	

Source: Authors' estimation. Absolute value of z statistics in parenthesis. * significant at 10%; ** significant at 5%; *** significant at 1%. All variables in log except the assets dummies. _cons represent the constant term.

The finding that five traditional variables in the life expectancy equation are rightly signed and significant during the pre-GATS period implies that as government increases the public health expenditure through additional budgetary provisions in African countries, the quality of life of citizens improves even if at the margin, as there remain health-related challenges facing African countries, in particular, the spread of some communicable diseases as well as the menace of HIV/AIDS. Since part of the increased public health expenditure assists in creating additional employment opportunities for physicians and training and retraining, the number of physicians is also found to contribute to improvement in life expectancy. In the same vein, malnutrition prevalence appears to have reduced with the result that a 1% reduction in malnutrition prevalence leads to 0.004% in life expectancy, which also implies that governments and all stakeholders need to channel more resources to increase nutritional contents of foods for children under-5 for demonstrable improvement in life expectancy.

The literacy rate improves life expectancy as expected due to the fact that a literate population would be able to read and understand information about health and wellness either as it relates to the individual or to the generality of the citizenry. A literate society better understands information about communicable and other diseases and their implication for health than a predominantly illiterate one. Likewise, when there is adequate health infrastructure such as hospitals, health centers and posts in the remotest areas of the country, coupled with other soft infrastructure such as the provision of adequate information on the need for such infrastructure, the population is likely to increase the rate of infrastructure utilization which will translate into improved life expectancy. The contribution of road infrastructure to the intensification of hospital infrastructure use cannot be overstated as road infrastructure plays the vital role of creating access to health infrastructure. Hence, the finding that improvement in road infrastructure assists in the improvement of life expectancy is not superfluous.

As expected and discussed above, none of the proxies for trade in health services variable is significant because it is assumed that even if this trade has been taking place, the lack of agreement in the form of GATS limited its intensity. After the signing of the GATS in 1995, the impact of GATS on Africa's health sector was expected to be more felt. For example in the case of telehealth and migration of health personnel abroad, where the

impact is expected to be negative if in the case of temporary movement, it becomes more regular with a bigger flow of health personnel. In other words, even as only few African countries committed their health sector in the GATS, the fact that a lot of movement of African health personnel to developed countries is in form of migration, not related to GATS, should also impact negatively on Africa's health system, but such migration should give a clue to what would be the impact on Africa of GATS related movement. We expect that the coefficients of the trade related variables will be larger and more statistically significant in the GATS period than in the pre-GATS period. The result with respect to the first expectation was obtained in the case seen in Table 7 as the GATS period's result trade-in-health variables have coefficients that are larger than those of the pre-GATS period. Specifically, the implication of the non-significance of the trade in health services proxy variables in the GATS period is that the impact of trade in health services on Africa's health sector should be limited to commercial presence (Mode 3) and movement of health professionals (Mode 4) which are the channels through which health services trade is conducted in many African countries. Even then, the importance of specific and direct health trade data cannot be overemphasized. The use of proxies may likely blur the expected impacts. One other reason may be the estimation technique which is the OLS. Using panel estimation or time series analysis could improve both the coefficients of the GATS period as well as their statistical significance. These are the areas in which this paper could be extended.

Conclusion

This paper broadly explores the relationship between trade in health services, its liberalization, and Africa's health system with particular focus on Africa. It finds that majority of African economies or governments spend less than 10 percent of the gross domestic product on health; the health component of total government spending could be regarded as a small percentage, with most African countries spending between less than 5% and 10% on health, while very few recorded between 15% and 20% of total government spendings on health. In addition, the situation of human capital resources is very poor with the number of physicians per 100,000 people remaining small in most of the countries. To compound Africa's health system difficulties, the financial resource input into the health system depicts a dismal picture of health sector financing, with private sector contribution to total national health expenditure being very high at

over 40% for majority of the countries. Africa's poorest indicator is the fact that health insurance is highly underdeveloped as out-of-pocket expenditure as a percentage of private expenditure remains very high, ranging between 40% and 100% for most of the African countries.

Though trade in health services data have not been made widely available, proxy measure of health services trade indicates that African countries record deficits in their health services account whereas they have high migration of health professionals abroad as well as some remittances from health workers resident abroad. Econometrics estimation shows that many traditional variables are significant and rightly signed but not the trade in health services proxy variables. The implication of the non-significance of the trade in health services proxy variables in the GATS period is that the impact of trade in health services on Africa's health sector should be limited to commercial presence (Mode 3) and movement of health professionals (Mode 4) which are the channels through which health services trade is conducted in many African countries. Even then, the importance of specific and direct health trade data cannot be overemphasized. The use of proxies may blur the expected impacts. One other reason may be the estimation technique which is the OLS. Using panel estimation or time series analysis could improve both the coefficients of the GATS period as well as their statistical significance. These are the areas in which this paper could be extended.

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