Montreal World Health Organization Simulation

MonWHO 2014 Theme Guide

Access to Health Care

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Access to Health Care

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Introduction

What is MonWHO?

Healthcare is not limited to the interactions between patients and doctors within the walls of a hospital. Healthcare, especially in the context of global health, is a multifaceted, multi-dimensional discipline that incorporates both the intellect of science and the dynamics of the social community. The Montreal World Health Organization Simulation (MonWHO) is a conference that aims to promote a macroscopic perspective of global health, and to draw attention towards the social, cultural, ethnic, economic, and political factors of international relations that affect the global health care system. In 2007, MonWHO executives hoped to create a conference where students from any field of study could collaborate to broaden their perspectives of international health. MonWHO has grown substantially since its inaugural conference and is now supported by the McGill International Health Initiative (MIHI). In 2009 and 2010, MonWHO hosted the Global Health Advocates of the Canadian Federation of Medical Students (CFMS). In 2010, MonWHO was established alongside the European World Health Organization Simulation (EuWHO) as part of a transnational project of the International Federation of Medical Student's Association (IFMSA).

A Note from the Theme Team

Dear Delegates,

This guide serves to provide you with a brief introduction to academic discourse surrounding the conference theme, Access to Health Care. Global health and more specifically accessibility of health care is a complex and multifaceted issue. From sprawling favelas in Rio de Janeiro to small farming villages in Tamil Nadu and everywhere in between, some of the world's poorest people are without access to essential health services. At MonWHO 2014, you will address some of the core issues stymying health and development around the world. In accordance with conventional academic analysis, this guide looks at issues of health from a regionalized perspective. To provide ample context for debate, we recommend that delegates familiarize themselves with the chapter pertinent to their country. As the conference will culminate with a series of international plenary sessions, it may be advantageous to read through the entire guide. We hope that you find this publication helpful and look forward to meeting you at the conference.

Sincerely,

Gregory Marks
Theme Director

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Africa

Overview

Sub-Saharan Africa is a region of the world that is critically burdened by population-level health risks. The region carries 13% of the world's population but 24% of GBD (global burden of disease) (Cooke, 2009). The average Sub-Saharan African life expectancy at birth in 2009 was only 54 years, compared with a global average of 68 years (WHO Regional Office for Africa, 2012). Poverty, underdevelopment, conflict, and weak governance can be cited as contributing factors to the region's comparatively low average life expectancy (Cooke, 2009). The main health factors inhibiting progress in raising life expectancy and contributing to the total DALY (Disability Adjusted Life Year) of the region can be broken up, in order of prevalence, into the following categories: communicable diseases, NCDs (non-communicable diseases), and maternal and newborn health.

Communicable diseases as a whole accounted for 71.1% of Africa's total DALYs in 2004 (WHO regional office for Africa, 2012). The so-called "big three" infectious diseases of HIV/AIDS, tuberculosis, and malaria, are responsible for the largest aggregate of Sub-Saharan Africa's DALY rates. However, focus exclusively on these diseases has distorted health systems and policy priorities, as maternal health, NTDs (neglected tropical diseases), chronic disease, and mental illness have received little international attention, although they are equally important and destructive health issues for the region (Cooke, 2009).

HIV/AIDS was the number one cause of DALYs in Africa in 2004. The prevalence of HIV per 100,000 people in 2009 for the region was 2,740, compared to the 502 global average. These staggering numbers are only compounded by the underdevelopment of the region, as 51% of the population living with advanced HIV was not receiving ART (antiretroviral therapy) in 2010 and 75% of annual global AIDS deaths occur in Africa (WHO regional office for Africa, 2012). This can be attributed in part to low-cost treatments' inaccessibility for many. As ART has to be sustained throughout a person's lifetime, costs of treatment are cumulative and unsustainable unless health systems are dramatically strengthened. Furthermore, HIV testing rates remain extremely low (Cooke, 2009) and educational structures are equally inadequate; only 34% of people in Sub-Saharan Africa have a comprehensive knowledge of HIV/AIDS (WHO regional office for Africa, 2012). HIV incidence rates are not projected to change up to the year 2030, largely due to population growth (Matthers and Loncar, 2006).

Tuberculosis (TB) is another leading contributor to the region's total DALYs. As of 2004, TB was the eighth leading cause of Africa's burden of disease, compiling 2.9% of total DALYs (WHO regional office for Africa, 2012). The disease continues to affect the region, as incidence remains high. In 2009 there were 2.8 million new cases of tuberculosis in Sub-Saharan Africa (Global Fund to Fight AIDS, TB and Malaria regional SSA report, 2011). The region has the highest number of tuberculosis related deaths in the world, and the highest per capita tuberculosis mortality. South Africa has the highest prevalence, incidence, and death rate per capita globally. HIV and tuberculosis are strongly linked, as Sub-Saharan Africa has the world's highest rate of co-morbidity between the two diseases (Cooke, 2009).

Malaria is another prevalent disease in the Sub-Saharan African region. In 2004 it was the fourth leading cause of burden of disease at 8.2% of total DALYs. The region's mortality rate per 100,000 people in 2008 was 94 compared to the global average of 12 (WHO regional office for Africa, 2012). The prevention and treatment of the disease is cost effective, but limited by the capacity of local health care systems and choices in public health policies (Cooke, 2009). Biologically, children under five and pregnant women are the most vulnerable to the disease. However, the economy and geography play significant roles in vulnerability to the disease, as the poor, displaced persons, and people who live in high prevalence, hard-to-reach, and epidemic prone areas are defined as extremely susceptible to Malaria (Mwenesi, 2005). Of recent, the effects of Malaria have escalated in Sub-Saharan Africa, as the 2010 Global Burden of Disease report showed Malaria to be the single largest cause of DALYs.

Neglected Tropical Diseases (NTDs) affect more than 500 million people in Sub-Saharan Africa (Hotez and Kamath, 2009). They cause fewer deaths than the "big three" but still make a significant contribution to increased DALYs and deaths (Cooke, 2009). The treatment for most NTDs is simple and inexpensive, working best when bundled together into "rapid impact packages" that treat more than one disease at once. Thus, NTDs exclusively affect the poor and powerless in rural and impoverished urban areas, a group for whom access is often unattainable (Hotez et al., 2006). Water-borne and diarrheal diseases remain strong factors in health risks for the population; diarrheal diseases were the third leading cause of DALYs in 2004, at 8.6% (WHO regional office for Africa, 2012). This prevalence can be attributed to the lack of access to safe water and adequate sanitation as it is estimated that only 62% of Africans have access to safe water and only 60% have access to adequate sanitation (Cooke, 2009). Although improvements have been made with communicable diseases, many are far from being eradicated.

Non-communicable diseases (NCDs) accounted for 21% of Africa's total DALYs in 2004 and represented the second largest aggregate contributor to the burden of disease (WHO regional office for Africa, 2012). Diabetes, hypertensions, cancer and chronic respiratory conditions are already a major burden in Africa and are increasing rapidly, especially in urban settings, where changes in diet, substance abuse, and increased sedentary lifestyles tend to take place. Although NCDs are a prevalent cause of DALYs in the region, this category of health risk is marginalized within African public health strategies and donor priorities; 80% of health budgets are allocated to communicable diseases (Cooke, 2009). Africa is home to the highest concentration of DALYs from surgical illness as it is estimated that 85% of children in Africa will require surgical care by the age of 15 (Cooke, 2009). Many surgical conditions can be treated cheaply with simple surgery if addressed early, but there remain poor prevention and screening programs, often necessitating complex, resource-intensive surgeries. Injuries account for the greatest burden of surgical disease, followed by obstetric complications, malignancies, congenital anomalies, and perinatal conditions (Ozgediz and Riviello, 2008). Although it receives very little support or attention, mental illness compiled 5.5% of total DALYs in 2004 (WHO regional office for Africa, 2012). Mental disorders are dangerous, as they increase the risk for other general health problems and care for mental health is often non-existent or very limited in Sub-Saharan Africa (Flisher et al, 2007).

Maternal health conditions made up 3.96% of total DALYs and perinatal conditions comprised 10.14% of total DALYs in 2004. Between 2005 and 2011, only 48% of Sub-Saharan African births were attended by a skilled health professional. The main causes of maternal death in 2004 were conditions such as malaria, HIV and anemia, at 37%; maternal hemorrhage at 24%, and abortion at 14%. The region's aggregate infant mortality rate per 1000 live births was 68 in 2011 (WHO Regional Office for Africa, 2012). Maternal health is further damaged by the marginalization of women in general. Lack of female autonomy negatively affects their access to healthcare, as they are often forced to ask permission from males and need a male escort when leaving the house. A lack of control of household funds to pay for healthcare further exacerbates issues of maternal health (Rutherford, Mulholland & Hill, 2010).

Children represent an extremely vulnerable group in Sub-Saharan Africa. The region's mortality rate for children under the age of five was 107 per 1000 live births in 2011 (WHO Regional Office for Africa, 2012). Countries in Western Sub-Saharan Africa have experienced a more rapid decline in under-five mortality when compared to the rest of the region (Institute for Health Metrics and Evaluation, 2013). Pneumonia and malaria are the leading causes of these childhood deaths, both at 17%, with prematurity at 12% and diarrhea at 11% (WHO regional office for Africa, 2012). Children are especially vulnerable to under-nutrition, evidenced by the 24.3% prevalence of mal-nutrition in the region in 2011 (World Data Bank, 2011). Despite recent improvements, life expectancy in Sub-Saharan Africa is still projected to remain under 55 in 2030 and public health challenges in the region are predicted to remain severe, due to global recessions, declines in foreign aid, food security issues, and potential reductions in export aid and trade (Matthers and Loncar, 2006; Cooke, 2009).

Health Care Delivery

There is a wide diversity of health care structures across the region, but the vast majority of countries feature a system that involves both biomedical and traditional care. The traditional healing system involves practices that incorporate plants, roots, animals, mineral-based therapies, spiritual therapies, and ritual use to prevent and treat diseases. According to WHO, up to 80% of the African population uses traditional medicine for their primary healthcare (Prata, 2008). Dependence on traditional medicine varies, as does the licensing and training of traditional healers. In much of Sub-Saharan Africa there is a general distrust between those in the biomedical profession and traditional healers. The prevalence of traditional healers may reflect the inadequacies of public sector national healthcare rather than an uncompromising adherence to traditional beliefs about medicine throughout the region, as traditional medicine is often the only form of healthcare accessible to many Africans (Romero-Daza, 2002).

In Sub-Saharan Africa, the biomedical system consists of governmental, private for-profit, national, and NGO (non-governmental organization) providers. NGOs and the private sector often fill the gap when the public sector fails to meet demand. Private care, however, is often prohibitively expensive for the poor, whereas NGOs tend to target vulnerable and poorer populations. NGOs and clinics of the private sector may receive government funding, but health ministries often do not adequately integrate the activities of the public sector and private sectors. In Sub-Saharan Africa, health care is often operated on a three-tiered system: basic primary care

facilities, secondary care facilities, and tertiary (national specialty) hospitals. As resources are generally focused at the tertiary level, there are stark differences in the quality of care at different facilities, which in turn creates a strong disadvantage for the poor who are the least likely to be seen at tertiary level facilities. Only about a quarter of health care budgets are given to basic primary facilities, despite being the site for the treatments of many of the most burdensome diseases (Prata, 2008).

To finance the health care systems in place, many governments in the region have instituted user fees. Among the poor, these fees have proven to strongly reduce access to care and often lead to self-diagnosis and alternative modes of treatment. Across the region, health systems chronically do not support the needs of the most vulnerable populations, due to inadequate governmental spending and inefficient use of funds (Prata, 2008). Despite vast health risks and abundant vulnerable populations, in 2010, only 6.5% of GDP for the region was spent on health, compared to the 9.4% global average. Furthermore, there is a heavy reliance on out-of-pocket expenditures, especially in poorer countries, further reducing access to health care (Kengne et. al, 2013). Improving health care systems is a difficult task in the region as investment tends to be focused on disease-specific interventions at times without regards for actual health impact. There is thus a chronic failure to provide the full range of health services, which proves to reinforce health inequities and undermine broader efforts at health risk reduction (Cooke, 2009).

The majority of financial resources donated from international organizations are funneled to disease prevention and treatment and thus, health care infrastructure and laboratories are chronically underfunded. Because of this, healthcare workers rely on clinical diagnosis instead of diagnostic testing that requires a sufficiently equipped laboratory. Clinical misdiagnosis is common and leads to increased mortality and morbidity through inadequate treatment. As a result of the inadequacies of many laboratories, tests are often not performed unless the patient can pay for a test kit (Petti et. al., 2005). Additionally, delivery of surgical services in Sub-Saharan Africa is often limited by the lack of basic surgical supplies and equipment. Surgical services require a complex combination of both human resources and infrastructure, both of which the region systematically lacks. Due to this underfunding of both physical and human capital, most African countries do not have proper trauma systems, which could prevent much injury-related death (Ozgediz & Rivello, 2008).

Mental health is even more inaccessible in the region; funding for mental health is disproportionately low compared to its associated burden. As of 2010, only 23 countries in Africa had a mental health policy and only 57% of African countries had community-based mental health provisions. In most of Sub-Saharan Africa, mental healthcare is provided by regular primary care workers, as specialist mental health care workers are concentrated in third-tier hospitals. Mental health care is thus often insufficiently flexible to react to the specific needs of patients. To improve the mental health systems in the region would mean overcoming various and wide-ranging challenges such as competing priorities, lack of community engagement, reliance on community unpaid volunteers, under-funding, paucity of medical health professionals, erratic supplies of psychotropic medication, and escalating need and demand for services (Hanlon, Wondimagegn & Alem, 2010).

Access to essential medicines is a critical problem in Sub-Saharan Africa; in 2004, it was estimated that 30 to 50% of people in the region lacked access to essential medicines (IVAC, 2011). Additionally, in 2009 only 37% of the estimated need of ART treatment was being met (Global Fund to Fight AIDS, Malaria and TB's SSA regional report, 2011). Much of the focus of improving access has been on financing and procurement, which remain a serious problem in the region. The out of stock rates for EHPs (essential health products) consistently exceed those of consumer packaged goods and hospital out of stock rates for life-saving medicines are often higher than what are deemed acceptable levels. Distribution of essential medicines and vaccines is made difficult by fragmented markets and poor infrastructure. Additionally, effective EHP distribution is complicated by temperature/humidity restrictions, the necessity of complicated tracking systems, and weak ordering and inventory systems. With few incentives and financing options for EHP supply chains, small retailers often do not have the economic capacity to stock EHPs with high value or slow turnovers (IVAC, 2011).

Sub-Saharan Africa faces a critical shortage in health professionals, with only 3% of the world's health human resources residing in the region (Cooke, 2009). Per 10,000 people, the region has only 2.2 physicians, compared to the global average of 14.2, and only 9 nurses and midwives, compared to the global average of 28.1 (Kengne et al., 2013). Most prominently, the region lacks surgeons; Africa has only 1% of the number of surgeons in the United States (Ozgediz & Rivello, 2008). Medical specialists are in short supply as well, especially in rural areas as 87% of medical specialists are located in urban areas (Kifle et al., 2008). Large differences in pay and income between health workers in the private sector and the public sector affects both retention and distribution of health workers. Richer urban settings provide more opportunities for private practice, whereas workers in rural regions are often forced to supplement their generally low and sporadic public sector pay with non-financial incomes, such as locally grown food. Additionally, health workers will sometimes supplement low pay by extracting informal fees from already poor patients, which further increases inaccessibility of already limited services (McCoy et al., 2009). In many countries, the ratio of health professionals to population is stagnating or even declining (Africa Working Group, 2006). This, in addition to low pay, is due to the burden of disease on health-workers, brain drain, and limited resources available to support the workforce (Meso, Mbarika & Pood, 2009). Outside of paid health professionals, community health workers comprise a large section of the health workforce in Sub-Saharan Africa. Community health workers are non-professionals who are residents of the communities in which they work and who typically perform one or more functions associated with healthcare delivery. They are generally trained in some way but usually have no formal professional or paraprofessional certification. Although community health workers provide essential services in very poor regions, local health professionals often inadequately support them. Due to absent or very small salaries, community health workers often have high attrition rates (Haines et al., 2007).

NGOs provide four main healthcare functions in Sub-Saharan Africa: they provide social services, are involved in social welfare activities that focus on the link between status and health, complement government initiatives, and provide research and advocacy services. The perception of NGO service quality tends to be higher than that of the state, as these organizations are often able to integrate closely into a community and address specific needs (Prata, 2008). International organizations have managed to substantially alleviate some of the biggest health risks in the

region. Significant improvements in control of the "big three" in recent years have mostly been achieved through donor support, which represents 60% of funding for tuberculosis and over half of funding for malaria care in some 25 Sub-Saharan African countries (Kengne et al., 2013). Despite recent gains, addition of international aid to chronically underfunded health care systems has not helped to holistically or sustainably improve health systems, as donors tend to focus on vertical models of disease control (Prata, 2008).

Case Study: Maternal Mortality in Sierra Leone

Sierra Leone still feels the effects of the brutal 11-year war that ended in 2002. Many of the causes of the conflict, including widespread corruption, poor governance, the marginalization and disempowerment of rural communities, and inefficiency in the delivery of public services, have not been improved. Health services severely damaged by the war have yet to recover as the number of government-employed physicians has dropped from 300 in 1991, to 78 in 2009. Sierra Leone is an extremely poor country with, in 2009, a GDP per capita of only 330 dollars. As an economy highly reliant on donor funding, approximately 70 per cent of the population lives below the poverty line. In 2007, Sierra Leone was ranked lowest in the UNDP Human Development Index, largely due to the gross inadequacy of its health and education sectors (Amnesty International, 2009).

The national maternal mortality ratio in Sierra Leone is the third highest in the world, at 890 per 100,000 live births (Data Bank, 2007). A woman in Sierra Leone is over 200 times more likely to die giving birth than a woman in Sweden (MSF, 2012). Maternal deaths are a risk to infants as well, as children whose mothers die during birth are ten times more likely to die prematurely (MSF, 2012). In 2009, the primary direct causes of maternal death in the country were obstructed labour, at 15 percent; hemorrhage, at 15 percent; anemia, at 15 per cent; ruptured uterus, at 11 percent; complications from unsafe abortion, at 8 percent; and eclampsia (associated with excessively high blood pressure), at 7 percent (Amnesty International, 2009). Issues of maternal mortality are exacerbated by a lack of blood banks, as Sierra Leoneans are often very reluctant to donate blood because of superstition (IRIN, 2008). A large barrier to decreasing maternal mortality rates in the country is the shortage of qualified human health resources. In 2012, the Sierra Leonean Ministry of Health had only three obstetricians registered for a population of over five million (MSF, 2012). In 2009, only 42 percent of deliveries were attended by a skilled health attendant and less than one in five deliveries occurred in health facilities (Amnesty International, 2009). In 2008, there were just 220 trained midwives in the country (IRIN, 2008). Even if a pregnant woman is seen by a healthcare professional, standards of care are often very low. Main challenges to maternal health sited by MSF include a lack of adequate referral facilities, insufficient resources for emergency obstetric and neonatal care, and poor geographic access to these services for women with complicated pregnancies (MSF, 2012). As of 2009, six of Sierra Leone's 13 districts had no emergency obstetric care at all (Amnesty International, 2009). Delays in women seeing health professionals are often due to the poor condition of roads and the long distances between rural health facilities. Beyond poor infrastructure and the lack of skilled health workers, families are often under-educated and thus unable to determine when medical attention is necessary (IRIN, 2008). Most communities in Sierra Leone have traditional birth attendants, but they are not trained or skilled and thus symptoms of complications during

pregnancy and childbirth are not always recognized (Amnesty International, 2009). Health facilities usually receive late referrals, who can no longer be treated. Even if women are seen on time, health facilities often lack drugs, supplies, surgical equipment, and even basic items like gauze and gloves.

Women in Sierra Leone often face discrimination that impedes their ability to access necessary health services during pregnancy and childbirth. A lack of access to information concerning sexual and reproductive rights, coupled with male-dominated decisions regarding family size, adds to the risk experienced by pregnant women. A study by CARE International found that 68 percent of mothers confirmed that husbands usually made the decision on where a child was to be delivered (CARE). In rural areas, it is widely believed that obstructed labour is caused by a woman's infidelity and thus precious delivery time is used to obtain confessions from women who require immediate medical attention. Additionally, approximately 94 percent of Sierra Leone's female population has been subjected to female genital mutilation, which increases risks during childbirth. Marriage of children under 18 is still widely practiced, despite its illegalization with the 2007 *Child Rights Act*. With early marriage often comes early pregnancy. In Sierra Leone, pregnancy is the leading cause of mortality for 15 to 19-year-old girls. Studies have also found that maternal mortality rates for 15 to 19 years-olds are twice as high as those for women in their 20s (Amnesty International, 2009).

Between 2001 and 2009, the government of Sierra Leone launched an initiative in an attempt to begin mitigating issues of maternal mortality. In order to increase the accessibility of the Basic Package of Essential Health Services, the government removed some user fees at the point of service delivery. The "Free Health Care Initiative" (FHCI), targeted towards pregnant women, lactating mothers, and children under five, is offered at government-run facilities. According to government reports, within the first year of implementation, 39,100 more women delivered their babies in a health facility and 12,000 more maternity complications were dealt with in health facilities. Despite these moderate improvements, shortages of healthcare staff and shortages in drugs and equipment still prevail and thus, the transition of the policy into tangible change has been challenging. Many problems still remain, specifically the lack of effective systems of monitoring and accountability. When essential drugs are available, women are often forced to pay recovery costs in return for their use. In cases when they cannot afford payment, women are often denied the care or medicine. In Sierra Leone, weak procurement, supply, and distribution systems along with weak and corrupt drug management systems combine to produce high rates of maternal mortality (Amnesty International, 2011).

MSF has also tried to address the high maternal mortality rates in the country with the creation of a central referral facility that provides emergency obstetric care and an emergency referral system (MSF, 2012). The majority of maternal deaths occur before, during, or just after delivery and with sufficient emergency obstetric care, many of these deaths are avoidable. Emergency obstetric care includes drugs, medical supplies and trained health staff able to detect and treat complications. In 2011, it was estimated that the average maternal mortality rate in Sierra Leone was 890 per 100,000 live births. In the district of Bo, which adopted an MSF-sponsored emergency obstetric care system, figures are far lower. With a maternal mortality rate of 351 per 100,000 live births, MSF predicts that Bo's levels of maternal mortality will be 75 percent lower

than the country average by 2015. Ensuring that women have access to quality emergency obstetric care is vital in reducing maternal mortality and from the experience of MSF, reductions have been neither costly nor rich in resource requirements (MSF, 2012).

Table 1.

Barriers and Opportunities to Introduction of Point-of-Care (POC) Diagnostic Tests to Low Resource Settings (LRSs)

Barriers	Impact on Supply	Impact on Demand	Opportunities
Ambiguous policy on use of diagnostics for clinical management	Undefined market opportunities and uncertainty in demand projections	The value proposition for adoption of a diagnostic test is undermined	Clearer policy guidelines with respect to diagnostic testing need to be established
Fragmented, unclear, and complex regulatory and registration processes at both international and national levels	Difficulty in mapping the most effective route to product registration when targeting to multicountry markets	In absence of clear international regulatory standards, procurers default to inappropriate regulatory standards	Where possible, regional regulatory and registration processes could be harmonized
Inconsistency between policy recommendations and regulatory standards	Leads to ambiguous product specifications and can lead to overdesigned, costly products	Leads to ambiguous criteria by which to evaluate technologies	Regulatory standards need to be harmonized with policy guidelines and publicized
Absence of robust and standard indicators/metrics to assess the impact of POC diagnostics tests beyond analytical performance	Challenge to demonstrate the value proposition for a POC product	No way of assessing the benefits of a new POC test when matched against central laboratory test	Investment is needed in fundamental operational research and modeling; local operational research capacity needs to be built
Inconsistency in purchasing practices from the donor community and national program	Leads to ambiguity in target price points and product specification trade-off decisions	Disenfranchises the end user (national laboratory systems) and patient as key stakeholders in defining product attributes and adoption decisions	Standards for assessment of impact and appropriateness of new POC technologies need to be developed and disseminated to key stakeholders
Poor definition of market opportunities	Challenging to define appropriate product profiles and specifications; disincentive to develop products specifically for LRS	A weak product pipeline, and products in the pipeline are often not appropriate for the end user; decision making for adoption of new technologies is poorly informed	Rigorous market intelligence needs to be collected and appropriately disseminated to key stakeholders
Undeveloped market environment	High uncertainty in timelines for product introduction and scale-up		

(Palamountain et al., 2012)

South and Southeast Asia 2

Overview

The region of South and Southeast Asia is composed primarily of developing countries, within which are rapidly growing cities and megacities. Megacities in particular are becoming increasingly more common, and are defined as having greater than 10 million inhabitants (Gurjar et al., 2010). One of the most pressing issues in Southeast Asian health is widespread air pollution associated with rapid urbanization and urban sprawl (Gurjar et al., 2010). Accordingly, the air quality in this region is associated with risks of deleterious pollution-induced health outcomes (Gurjar et al., 2010). Non-communicable diseases including cancers and cardiopulmonary diseases could increase in prevalence as a result of such environmental toxins.

Two of the most problematic infectious diseases in South and Southeast Asia are TB and HIV. Southeast Asia bears 40% of the global burden of TB, with a prevalence of 5 million cases (3.5 million new) in 2010 (SEARO, 2013). In particular, India bears 25% of the world's incidence, and is ranked number one as the highest TB-burdened country in the world. Generally in Southeast Asia, the majority of infections occur during the most productive years of life, from 25-54 years of age. Infections are far more common among males, with a male to female ratio of 2:1. Optimistically however, due to the implementation of WHO-speared programs called Directly Observed Treatment, Short-course services (DOTS), there has been an overall 40% decrease in TB disease prevalence compared to the 1990 baseline (SEARO, 2013). Despite reductions in TB-prevalence, the HIV epidemic is growing in Southeast Asia, with 3.5 million people living with HIV (PLHIV) in Southeast Asia, representing 11% PLHIV worldwide in 2009 (SEARO, 2013). Five countries in Southeast Asia account for most HIV cases globally; for example, 2.4 million PLHIVs reside in India alone. Thailand has the greatest HIV prevalence, followed by Myanmar, Nepal, India and Indonesia. Overall, the rate of co-morbidity is 5.7% in Southeast Asia, and a high case-fatality rate of TB in areas with high HIV prevalence has been observed (SEARO, 2013).

Health Care Delivery

Health systems in South and Southeast Asia offer a heterogeneous mixture of public and private health care, combined with growing trade and medical tourism. The growth and expansion of an educated middle class in many countries in this region has resulted in the creation of a booming private sector, resulting from demands for high quality care and access to the newest technologies (Chongsuvivatwong et al., 2011). Governments in many of these countries are looking to a future of universal coverage of basic health services, with targeting towards populations who may be disadvantaged or vulnerable. Some systems that target such disadvantaged groups include the Health Card in Thailand, the Health Fund for the poor in Vietnam, and Health Equity Funds in Cambodia and Laos (Chongsuvivatwong et al., 2011).

In China, public health spending is just 4.92% of the total GDP, which is under the 5% level recommended by the WHO (Jiang et al., 2013). Both private and public health care systems exist in China. Privatized health care in China however contrasts with most other Southeast Asian countries. Private institutions serve primarily disadvantaged people, providing cheaper care than

public institutions, likely a consequence of competition with other private health care institutions (Liu et al., 2006). This results in higher consumer satisfaction in quality and price. However, in 2006, 60% of payments towards health care in China were out of pocket (Liu et al., 2006), and rising costs of health services and medicines are obstacles to accessing health care (Jiang et al., 2013). In particular, those most at risk are the poor and those who live in rural areas, and there is an obvious disparity in quality of care and access (Jiang et al., 2013). Those with health insurance in urban areas account for only 50%, while in rural areas only 12-20% have insurance (Liu et al., 2006). Moreover, about 17% of China's population is living below the international poverty line of $1/day, and thus is unable to afford adequate treatment (Jiang et al., 2013).

In Malaysia and Thailand, two of the more well-developed nations of Southeast Asia, spending on public health has a relatively pro-poor focus. Both countries can afford to have a dual system of public and private health care, with the public portion being universal health care funded by general taxation (O'Donnell, 2007). In Malaysia, the private health care sector grew from frustration with long wait times and a lack of responsiveness, which created a market for privatized health care. The private health care system is used mainly by those who are well off and can afford to bypass the long waiting times, bottlenecks, and bothers of the public system. The success of the private system has allowed the government to shift public spending towards those with lower incomes (O'Donnell, 2007).

In Sri Lanka, disadvantaged people have access to healthcare, and in general, the distribution of health resources favors the poor since the country spends a significant portion of public spending on health care. The low-income countries of Bangladesh, India and Indonesia have both public and private systems of health care, but with an obvious discrepancy in quality of care between those with low and high income, primarily due to purchasing power (O'Donnell, 2007). In India and Bangladesh, those people who are impoverished are left only with the option to utilize inadequate care from unqualified providers. Moreover, in Bangladesh, resources are concentrated in large hospitals in urbanized city centers, which have a strong tendency to be located far from the rural outskirts, making them less accessible to the poor (O'Donnell, 2007).

Systems within Southeast Asia that are funded through general taxation tend to be stable, due to the strong governmental and health agency influence on maintaining adequacy and equity in care (Chonsuvivatwong et al., 2011). However, Vietnam and Indonesia have both decentralized their health care systems, and in doing so, have greatly impacted their systems' performance and equity. In Malaysia, the health care system is changing from a public system with heavy government influence, towards one with greater privatization of health care (Chonsuvivatwong et al., 2011).

In India, there is a combination of both traditional and conventional practices in mainstream medicine. Allopathic health care service providers, including doctors, nurses, dentists, physiotherapists, and physicians are generally trained in practices such as Yoga, Sidha, and Homeopathy (Rao et al., 2012). In addition, about 25% of the informal registered medical practitioners (RMP), who act as the first contact for health care in rural or urban poor areas, have no medical training. India is burdened by a simultaneous deficit of qualified health workers and excess of unqualified health workers, particularly in poor areas, in both rural and urban settings.

The quantity of allopathic health care workers in India is under half of the WHO guideline of 22.8 workers per 10 000 people. Moreover, there is a dearth of governmental influence and regulation, which is needed to sustain an adequate quality of health care service (Rao et al., 2012).

Like India, China has an unfortunate paradox of a simultaneous excess and shortage of health care workers. In 2005, the country featured a surplus of new medical graduates. Those who were unable to find appropriate work often transferred to other professions in order to avoid unemployment (Hu et al., 2008). Conversely, there is a striking scarcity of health care workers in rural areas, especially workers with advanced training. For example, of health care workers in urban areas, 43% have at minimum a bachelor's degree; in rural areas however, only 13% do (Hu et al., 2008). China also suffers from a distinct shortage of nurses; the nurse-to-population ratio is even lower than the medical doctor to population ratio (Liu et al., 2007).

In 2005, the Chinese Ministry of Health started the "Ten Thousand Physicians to Support Rural Healthcare Project" in order to temporarily relieve unfilled demand for high quality care in rural areas (Hu et al., 2008). The Ministry sent 10 000 doctors and nurses to the countryside for 6 months to a year. While the program was transiently effective, it did not, however, solve the issue of sustained inadequate care in rural areas (Hu et al., 2008).

In terms of physical access, trends are varied within South and Southeast Asia. In Malaysia for example, 50% of the population lives less than 10 km away from a public hospital and 4.6 km from a public clinic (O'Donnell, 2007). In Sri Lanka, the majority of the population lives within 5 km of a healthcare facility, and in rural areas, most people live within 5-10 km of a peripheral facility (Hsiao, 2000). In Thailand, health care is highly centralized in Bangkok, but in all sub-districts and districts there is extensive infrastructure throughout rural areas for primary care centers and community hospitals. Finally, in Vietnam, health care is relatively accessible to those in rural regions, as there exists a network of collective health centers (O'Donnell, 2007).

Telemedicine in India has demonstrated proof of concept in improving health care access in rural and remote regions. The Indian Space Research Organization (ISRO), which has connected 22 specialist-hospitals with 78 rural/remote hospitals across India via geo-satellites, facilitated access to expert consultants for patients in rural areas by removing the burden of traveling to city centers (Bagchi, 2006). This telemedicine technology is set up at rural hospitals, where a personal computer with medical software is connected to diagnostic tools such as an electrocardiogram or x-ray machine. Using satellite technology, the results from these instruments are sent to the specialists who, along with the local doctors, can then appropriately diagnose and/or treat patients with the help of video-conferencing (Bagchi, 2006).

ONCONET-Kerala is an oncology network, which is considered a pilot project in telemedicine to provide cancer care to the rural population of Kerala, India. A specialty cancer hospital was connected with remote hospitals to aid in the follow-up and continued care of patients with cancer (Sudhamony et al., 2008). Since these patients struggle to access health care in a timely manner, there is a real market for telemedicine in these regions. This method allows for the avoidance of travel expenses for patients who reside in remote and rural areas and who need to

access a major hospital. In addition, patients have benefited from early cancer detection, treatment, prevention, education, and avoided unnecessary admission as a result of this technology. Overall, the telemedicine project was a success, and has sparked plans for a larger-scale ONCONET-India (Sudhamony et al., 2008).

Much of the potential for emerging technology lies in the increasing use of the Internet among remote or disadvantaged populations. Currently, there is an inequality in information technology access and use. For example, the Internet is frequently underrepresented among disadvantaged groups, such as elderly, disabled, and rural groups, which is a result of the so-called "digital divide" (Lai et al., 2004). Optimistically however, in the past 2.5 years Internet use of consumers above 55 years of age has increased by 50%, suggesting a large potential for the future of these technologies as a health care platform.

Case Study: Medical Tourism in Southeast Asia

Demand for health care has grown rapidly in association with rises in income and educational attainment among the global population. Changes in demography, such as aging populations in developed countries, and shifts in disease burden from infectious to chronic diseases, have also stimulated the demand for high quality health care. The availability of medical services in some nations at competitive costs, combined with the lack of availability, long lines, and high costs in other nations has fuelled a new wave of health care consumers: medical tourists (Pocock and Phua, 2011).

Medical tourism is broadly defined by patients who travel abroad to seek medical care. The medical treatments are sometimes combined with recreational activities, hence the term 'medical tourism'. In Southeast Asian countries such as Malaysia and Thailand, medical tourism has emerged as a growing industry and key economic strategy (Pocock and Phua, 2011). Malaysia and Thailand have also become main medical hubs in the region, attracting patients from within and outside Southeast Asia.

The Birth of Medical Tourism

Prior to the East Asian financial crisis of 1997-1998, Southeast Asia experienced a period of strong economic growth. Educational attainment was rising and the middle class was expanding, moving in hordes to large city centers. These people put significant pressure on governments and health care providers for higher quality medical care, specifically in response to frustration with a perceived lower quality and responsiveness of public health care. The demand resulted in the formation of private health sectors in many Southeast Asian countries including Malaysia and Thailand (Chongsuvivatwong et al., 2011). However, these private hospitals suffered after the financial crash. The devaluation of the Malaysian *ringgit* and the Thai *baht*, induced soaring prices of imported medical supplies and technologies, rising unemployment, and losses of savings, pushing previous fee-paying clients back to public services (Chee, 2008; Turner, 2007). In response to their diminished clientele, private hospitals sought to attract foreign customers with the help of their governments and thus used devalued currency as a prominent marketing point. Both Malay and Thai private hospitals capitalized on their ability to promote medical services and travel at highly competitive prices by attracting wealthy foreign patients (Chongsuvivatwong et al., 2011). Medical tourism has since become a highly lucrative industry in Southeast Asia.

Medical tourism in Malaysia and Thailand has received strong support from the government, due to the practice's tangible economic benefits including foreign investment in public health infrastructure and job creation. Revenues from this industry and reduction of emigration of health care workers to other countries such as the United States of America also incentivizes governments to help the medical tourism industry grow. Economic development in Malaysia and Thailand also improves the countries' health status, by affording the potential for decreases in child mortality and increases in life expectancy (Pocock and Phua, 2011). The Malay and Thai governments largely work as marketing vehicles, promoting their private hospitals abroad through the creation of medical tourism committees and departments that are solely devoted to

increasing the inflow of international patients. For instance, in 2003, Thailand established their medical hub policy. In that same year, Malaysia formed an inter-ministerial committee for the promotion of medical tourism (Pocock and Phua, 2011). More recently in 2009, the Malaysian government launched the Malaysia Healthcare Travel Council (MHTC) which aimed to restructure the health care system to bring in more international patients (Sarwar, 2013). Additionally, medical visas in these two countries are available for foreign patients (Pocock and Phua, 2011). Medical tourism in Malaysia and Thailand thus enjoys strong governmental support.

The Malaysian and Thai medical tourism industries are built on a promise of high quality medical services at low costs. Many private hospitals in Thailand and Malaysia have been accredited by the Joint Commission International (JCI), which is known as the top international assessor of health care facilities (Turner, 2007). When assessing the costs of procedures to medical tourists, a favorable currency exchange along with low wages in Thailand and Malaysia results in highly competitive pricing. For instance, a coronary bypass in the United States, valued at about $130 000, costs only $11 000 in Thailand (Woodman, 2007). In the Southeast Asian medical tourism market, Thailand has become the leader in volume with 1.3 million patients treated in 2006 alone (Chongsuvivatwong et al., 2011). Malaysia also features a substantial quantity of medical visitors, estimated at 300 000 in 2006 (Connell, 2011). These countries also have medical niches, with cosmetic and gender reassignment surgery in Thailand, and cardiac and cosmetic surgery in Malaysia (Pocock & Phua, 2011; Aizura, 2010).

Negative Impacts of Medical Tourism

Due to government support, criticisms and concerns of the impacts of medical tourism on Thai and Malaysian public health systems are often overlooked and ignored. The countries already face issues with their provision of universal care which medical tourism will only serve to exacerbate (Connell, 2011). Both Malaysia and Thailand have a two-tiered health system, consisting of privatized health care for those who can afford it and public services for those who cannot. The disparity in the quality of health care will be worsened by medical tourism, with citizens already perceiving public services to be unresponsive and of poor quality (Pocock and Phua, 2011). There also exist problems in these two countries with retaining healthcare workers in the public sector. Malaysia has recently experienced a large migration of health care workers from rural/poor states to private hospitals in urban centers, thus limiting resources for those using public services (Rasiah et al., 2009; Connell, 2011). The large discrepancies in salaries between private and public health care workers, combined with lower workloads in the private sector, has sparked the movement of human health resources from public to private hospitals. As specialists have transferred from urban public hospitals to private ones that cater to foreigners, a stress has been placed on the country's public health system. In Malaysia, only 25% of specialists practice in the public sector and this number is expected to decline further (Quek, 2009: Pocock and Phua, 2011). Medical tourism will only exacerbate the drain of health care workers from the public to private sector.

Both Malaysia and Thailand invest significantly in their private health sectors, medical tourism included. The Malaysian government provides subsidies in the form of tax breaks and

preferential access to land. However, the use of public funds in this matter will not likely benefit the public health system as private hospitals cater largely towards foreign patients and wealthy citizens. While private health care remains well funded, construction of new public health care facilities in Malaysia has stalled due to a lack of governmental resources (Pocock and Phua, 2011). In Thailand, new medical graduates already preferentially decide to work in private hospitals, a practice which medical tourism could serve to further encourage. Medical schools in Thailand receive significant public funding. The return to this investment in health can be jaded though as more lucrative private hospitals often attract the brightest graduates. In an attempt to prevent such practices, some governmental action has been taken, as both Malaysia and Thailand have developed programs requiring graduates of public medical universities to sign 3-year public hospital contracts. Further attempts have been made to offer competitive wages at public hospitals, often by standardizing medical fees for local and foreign patients (Turner 2007).

Privatized hospitals in Malaysia and Thailand are regulated by industry and accredited by international organizations, whereas public hospitals are regulated by the Ministry of Health. These regulating bodies have different standards, promulgating a difference in the quality of healthcare received by fee-paying and non-fee-paying patients. Private hospitals have higher standards than public hospitals, which can lead to different health outcomes between those able to afford private care (including foreign patients) and those who cannot (Turner, 2007). For instance, the Bangkok Hospital boasts itself as the only hospital (private or public) in Thailand to have a Gamma Knife, but access to this advanced medical technology is restricted to those who can afford private care (Turner 2007). Furthermore, private and public hospitals do not share resources. In private Thai hospitals there are 10 000 unused beds yet there are not enough bed and long waiting times in public hospitals (Poopat, 2010; Connell, 2011). Inequity exists in Malaysia and Thailand in regard to access and quality of healthcare received by those able to and not able to afford healthcare, a situation which medical tourism has already begun compounding.

The rise of medical tourism in Malaysia and Thailand and the governments' continued support certainly raises concerns about the inequitable access and quality of health care in these countries. Medical tourism has the unfortunate ability to exacerbate existing disparities over access. Ideally, revenues from caring for foreign patients would be invested into the countries' public health care systems and their goal of universal healthcare for all. However, if this is not achieved, health gaps between those who can and cannot afford treatment will widen. Unfortunately, the long waiting times in the home countries of foreigners who come to Malaysia and Thailand for treatment are transferred to the poor-middle income citizens who are unable to pay for health care. Proper government intervention is needed to mitigate the inequitable access gap with an ideal target of health care for all.

East Asia and Oceania

Overview

East Asia and Oceania, exclusive of China, are primarily comprised of high-income nations. Instead of suffering from a double burden of disease, the greatest concerns in this area are non-communicable diseases, specifically, cancer, heart disease, cerebrovascular disease and diabetes (WHO, 2011). Japan, a country with a rapidly ageing population structure, features high incidence of stroke, heart disease, and cancer (IHME, 2010). The Republic of Korea is also experiencing a drastic rise in non-communicable disease, with the leading causes of death being cancer, cerebrovascular diseases, heart diseases, suicides, diabetes, and traffic accidents. Problematically, the Republic of Korea has one of the highest smoking rates of any country in the OECD (WHO, 2011).

Australia has had a small improvement in ranking among OECD countries for obesity rates. The country however is still the third worst on this measure (WHO, 2011). One of the major contributing factors to the trend is the same modernization of lifestyles that is present in other highly developed nations. The "modernity paradox" refers to the fact that children in modernized countries such as Australia are often less healthy than earlier generations were, as a result of obesity, diabetes, mental health problems, developmental disorders, learning disabilities, childhood asthma and other allergies and disorders (Armstrong et al., 2007). Besides the small improvement in obesity, rankings in Australia have also improved in a number of other categories, such as smoking rates, heart diseases, lung and colon cancer, transportation accidents, respiratory diseases, diabetes, and prostate cancer (WHO, 2011). In 2009, the leading cause of mortality was ischemic heart disease, followed by cerebrovascular disease, dementia and Alzheimer's disease. These last two diseases can be explained by the ongoing shift towards a burden of disease profile consistent with an aging population. More people are expected to suffer in the future from disability caused by dementia, Parkinson's disease, hearing and vision loss, osteoarthritis, and cancer (WHO, 2011).

New Zealand's disease profile is very similar to that of Australia. Cancer and ischemic heart diseases were the leading causes of death in 2007, and obesity affects over half of the adult population, and almost a third of children. The increasingly ageing population of this region is burdened by long-term conditions such as dementia and cardiovascular disorders (WHO, 2011). As in Australia and a number of other regions, inequalities exist in terms of health risks. For example, more deprived populations such as the Maori and Pacific people tend to have higher smoking rates. Additionally, Maori people are more likely to be obese (WHO, 2011).

Health Care Delivery

Health care provision in East Asia and Oceania is a combination of public and private services. In Hong Kong and Singapore, hospital sectors are largely public, whereas first-level clinics are mainly privately owned, operated, and financed (Wagstaff, 2007). Despite the public ownership of hospital sectors in these states, Hong Kong is 80% financed out of general revenues and Singapore relies heavily on private finance. Contrastingly, in Japan, Korea and Taiwan, hospital sectors, hospital clinics, and ambulatory care are largely privately operated, but the latter two

receive a large portion of their financing from public sources such as the Universal Health Insurance reimbursement (Wagstaff, 2007).

The Asian tigers, along with Japan, increased their share of GDP devoted to health between 1998 and 2001. They financed this change in a number of ways. Hong Kong generates half of its health finances through general tax and non-tax revenues. Japan, Korea and Taiwan all use social insurance for about half of their spending. Singapore finances as much as two-thirds through out of pocket payments. And in fact, all of these nations, except for Japan, rely on out of pocket payments for over 30% of spending. Finally, in Taiwan and Hong Kong, private insurance accounts for a fairly small share whereas among the other Asian tigers, it tends to be negligible (Wagstaff, 2007).

High-income countries, such as Japan and Hong Kong, have been able to achieve universal health care coverage. However, within-country inequalities still exist. In Japan, this symptom of inequality is lessened by the social insurance law that demands equal benefits for all (Langenbrunner & Somonathan, 2011). Inequalities are also more rare when restriction on access to services are fewer, as they are in Hong Kong. In low-income countries however, inequalities are more present, as is to be expected. For example, in Papua New Guinea, the tax-financed system hasn't achieved universal coverage and the poor face significant barriers to access, such as formal and informal charges for using public health facilities (Langenbrunner & Somonathan, 2011).

In East Asia and the Pacific in general, high-income countries tend to rely on public payment, comprised of taxes and social insurance. Wage-related contributions that are shared among employers and employees occupy a large portion of prepayment revenues in social insurance systems. In these countries, private insurance represents a small share of overall health expenditure. Out of pocket payments, copayments, coinsurance and deductibles are also very present in these economies (Langenbrunner & Somonathan, 2011).

Japan's population is the oldest in the world; it is expected that in 2050, 40% of Japanese people will be aged 65 or older. This predominantly elderly population is likely to heavily burden the health care system, as fewer people will be contributing to the finances of the system and a relatively greater amount of the population will be dependent. Additionally, the older population will likely be suffering from chronic, and therefore expensive diseases (Hsu & Yamada, 2007). In this country, the labour tax burden is likely to jump from 29% to 40% to support the ageing population unless there is health care reform. Two potential places for reform, the Universal Health Insurance co-payments and a consumption tax, would improve the welfare of future generations, but at the expense of current residents. Moreover, public support for such a proposal is far from being reached (Hsu & Yamada, 2007).

Different financing methods result in different results depending on their context of implementation. In East Asian and Pacific low-and middle-income countries, financing is generally progressive, whereas in high-income countries there is a tendency for more regressive financing. For example, the burden of health financing through total payments is generally progressive in Hong Kong. In Japan however, it is regressive, as well as in Korea and Taiwan,

though to a lesser extent (Langenbrunner & Somonathan, 2011). In terms of taxation, this is also most progressive in Hong Kong, followed by Korea and Taiwan (Wagstaff, 2007). In Japan, on the other hand, taxes are regressive. In all of these systems, social insurance contributions are regressive, and private insurance is progressive (Wagstaff, 2007).

With increasing technological innovation and changing environmental and economic conditions, the relative share of public and private financing sources of East Asian health care systems may change. For example, Australia's healthcare system will soon face the challenge of the cost of keeping up with new technologies. Publicly financed health care will need to keep up with new technology in order to appease the tax-paying population. Since there is a mix of public and private healthcare funding in Australia, the system is vulnerable to inequalities in health care delivery, favoring the private sector (Armstrong et al., 2007). In the past decade, out of pocket costs have increased 50% and private healthcare is still less frequently available in rural and remote areas, than it is in cities (Armstrong et al., 2007).

A number of emerging technologies have the potential to positively influence health care access and delivery in the region of East Asia and Oceania. For example, educational advancements have been made in the field of m health or mobile health. Fiji's "Dr. SMS" is an application that allows its subscribers to directly communicate with doctors, issue alerts about emerging diseases, and provide a platform for natural disaster response. Using this application, doctors can also provide referrals to nearby medical facilities. A similar m health program also exists in Papua New Guinea called Haus Lain, launched by a global health NGO called PSI. The program sends SMS text messages to subscribers on a variety of educational topics, including malaria, prevention of child and infant deaths, gender-based violence, and HIV (Cave, 2012).

In addition to m health, e health is rapidly developing as a healthcare tool. E health refers to use of the Internet rather than mobile devices for improving the scope of healthcare. Using social media, for example, healthcare providers can record and communicate information and data on diseases, disasters, and resource needs in real time, which allows for better coordination of healthcare and humanitarian response (Cave, 2012). The Fiji Medic Home Run program works in this way by sharing and discussing medical information, and answering questions and health issues from participating Facebook members (Cave, 2012).

E health innovations in the East Asia and Oceania region have also been developed in online infrastructure for assistive healthcare. Mobile Cloud for Assistive Healthcare (MoCAsH) is a proposal for an advancement on already established healthcare applications of cloud computing (Hoang & Chen, 2010). Cloud computing simply refers to the use of many computers all connected through the Internet in real time. The MoCAsH infrastructure differs from previous cloud computing models in that it tackles issues of security and privacy to protect data and data ownership, and to strengthen security aspects. In addition it enhances the quality of service. The MoCAsH would retain the three original characteristics of cloud assistive health care: mobile sensing and actuating, active health records, and a collaborative protocol. The benefit of successful integration of health care and an Internet and mobile technology platform is the potential for better accessibility to healthcare providers, as well as enhanced efficiency and quality of service. This type of technology is at the forefront of a transition from traditional

health care and monitoring systems to an automatically monitored system that enables rapid emergency response. A number of similar technologies have been developed in this field that may have similar potential. For example, one technology developed at the Seoul National University Korea is called SmartUM, a large-scale cloud middleware (Hoang & Chen, 2010).

The expanding domain of e health also has applications in the surgical field. Shimizu et al. (2007) have succeeded in internationally disseminating surgical images while completely retaining the original image quality. This high quality image transmission is a particular success in the field of surgery since a high-quality and accurate depiction of anatomy is imperative to support safe and successful procedures. The implications of this success could revolutionize medicine and medical education. This technology has also advanced in other regions within Asia and the Pacific. For example, other recently developed telesurgery practices include live streaming of surgery and video-conferencing in real time, both of which facilitate dissemination of surgical knowledge and expertise, greatly enhancing the educational potential in this discipline. Moreover, telesurgery may be further applied into telemanipulation by robotics, computer-assisted surgery and teaching with the help of virtual reality. A follow-up study boasted that, of surgeons at one teleconferance, 99% and 90% placed emphasis on the importance for opportunities to ask questions and establish direct contact with experts, respectively. Clearly this educational opportunity is invaluable. This technology has also widely expanded regionally. Originally communicating just between Japan and Korea, it now exists in 20 cities in 10 countries. In addition, 20 major institutions and 13 meeting venues have made preparations for surgical telecommunication using these techniques. This e health application is the first to have been applied at a large scale to surgery (Shimizu et al., 2007).

Australia has made efforts to implement Health and Information Technology (HIT) in its health care system. Accordingly, the National Health Information Group implemented “HealthConnect” with the goal of decreasing health care costs. The implementation of an electronic health record (EHR) is one of HIT’s elements. In fact, the government of Australia has more than doubled its current investment in the development of EHRs (Anderson et al., 2006b). To use the EHR, patients will be able to choose which portion of their current health record will be transmitted to the HealthConnect record, and privacy and confidentiality is protected by the federal government and Australian states. It has been noted that although the current spending on HIT-related projects is under $100 million, there are proposals for up to $1.1 billion to be put towards these types of projects. The program is funded with the help of Australian territories and states (Anderson et al., 2006b).

Aging Population and Health Care Costs: A Case Study of Demographic Change and Public Finances in Japan

Introduction

Population aging and the pressure that this demographic change puts on the finances of governments is gaining importance in the 'developed' world, as the fertility rates of many countries are decreasing and people are living longer. Japan, which is one of the countries aging the most quickly, is not escaping the challenges associated with such demographic changes. Impact of population aging on the financing of health care is multifaceted and has more than one cause. This case study will use Japan as an example of the consequences of demographic changes on financing of the health care system, and on health care accessibility for future Japanese generations.

The Japanese health care system

In Japan, everyone has the obligation to contract health insurance, with employers and employees contributing equally to insurance premiums (O'Donnell *et al.*, 464). Low-income citizen's insurances are taken care of by the government, given the universality of Japan's health care system:

> Japan's health insurance plans are entirely controlled by the government, including employer-provided plans and plans for individuals with low income and the elderly. Medical spending is shared by insurance (53 percent), government (32 percent), and out of pocket (15 percent). The coverage is identical across plans, including hospital services, physician expenses, laboratory tests, and outpatient prescription medications. (Yashiro, 21)

Japanese citizens contribute to one of three insurance premiums: the Society-Managed Health Insurance (SMHI), managed by employers; the Government-Managed Health Insurance (GMHI), managed by the government for people whose employers do not provide for insurance; or the Citizens' Health Insurance (CHI), for "self-employed [and] lower income" people (Yashiro, 22). Heavy burden is put on the Japanese government as a large portion of "enrolees in SMHI and GMHI switch to CHI after retirement. As a result, the elderly share of enrolees is 25 percent in CHI compared to 3 percent in SMHI and 6 percent in GMHI." The Japanese government controls discrepancies between different insurance plans by subsidizing 50% of the health care costs of CHI (Yashiro, 22). Moreover, the Health System for the Elderly (HSE) acts as a pool for the "health care costs for individuals age seventy and older across various health insurers." (Yashiro, 24) Population aging will have the obvious effect of increasing the burden for the Japanese government, as more and more people will be retired, and as a shrinking workforce will contribute less to tax revenue.

Demographic pressures

In 2011, the fertility rate in Japan was as low as 1.39. It has been declining since the 1960s, reaching an all-time low in 2005, at 1.26. Moreover, Japan's life expectancy rate was the world's highest, at 82.59 (male and female combined) in 2011. Japan's life expectancy has almost constantly risen since 1960; the highest values having been reported in 2003, 2005, and 2009. Given very low fertility rates, the share of people aged 65 and older has been rising constantly from 5.73% in 1960 to a high of 23.39% in 2011. Given low fertility rates and high life expectancy, this share is expected to continue increasing in the next decades. Indeed, "Japan's population will have the largest proportion of old people in the world in 2050, when 40% of its population will be over 65 years of age." (Tamiya, 1183) But what impact would such a large portion of residents aged 65+ have on the Japanese health care system?

Challenges

High involvement of the Japanese government in health care system financing makes public finances more vulnerable to demographic changes and other shocks to the Japanese economy. As the portion of elderly people increases and people live longer, pressure is put on the financing of health care. In fact, new technologies making possible longer and healthier lives are often costly, and rich states such as Japan cannot – politically – afford to ignore the existence of such innovations. As the elderly comprise a large proportion of Japan's dependent population, the demand for new and innovative medical technology is only likely to increase (Tabata, 472).

With exceptionally low fertility rates, further pressure is put on the health care system as a shrinking labour force must contribute more to address the costs of a growing elderly contingency. Elders are currently responsible for almost one-third of total health care costs in Japan (Yashiro, 19). They are also though responsible for a huge portion of *"increase* in [health care] costs," ninety percent, writes Yashiro. These grand health care costs attributed to the elders are due to longer time spent in the hospital and to the high costs of technology required to respond to the elders' demand, but also to the fact that retired people often "switch to the local authorities' insurance plan," thus "[increasing] the burden on these plans." (Yashiro, 20)

If no reform is brought to the Japanese health care system, it is likely that, given demographic pressures, proper financial resources will be lacking. Although Japan does not spend a lot per capita on health care compared with other countries, the amount spent has been increasing (private and public expenditures combined). Japan spent $3,958 (current US dollar) per capita on health care in 2010, up from $2,612 in 2006. In 2010 in the United States, health care expenditure per capita was $8,233, whereas in Canada it amounted to $5,257. In order to maintain universal accessibility to health care, Japan will have to resort to some changes in the financing of its system.

Potential policy implementation and consequences

With changing demographics putting increasing pressure on the health care system, there are a number of potential systemic changes being proposed in Japan. First, contributions to insurance premiums could increase. Also, taxes could be raised, an idea that receives much public

opposition. On the other hand, out-of-pocket payments could in the future cover a larger share of the total medical cost. Faruqee *et al.* estimates that "medical contribution rates would have to go up by" about fifteen percent to impart true impact (196). Another scenario is a "reduction in social security benefits" (Faruqee *et al.*, 198). The Japanese government could also decide to increase the retirement age, but with the old-age dependency ratio in Japan already at 36.93% (Faruqee *et al.*, 198), the population may negatively receive such an increase.

Imai highlights some problems that could be targeted by the Japanese government. Targeting these issues could reduce the financial burden of health care by increasing efficiency of the system. They are: "the volume of consultations appears to be excessive [,] hospital stays tend to be long [,] the fragmented social insurance system has resulted in horizontal inequity in finance [and] the size of insurance funds…is insufficient to pool health risk effectively." (Imai, 157) In order to reduce the number of consultations per doctor and thus to reduce the amount of work doctors endure; Japan could make consultations more expensive. Consultation fees could for example be calculated on the basis of revenue, maintaining accessibility as high as possible. Since "hospitals are largely paid on a bed-day basis," (Imai, 164), one witnesses long lengths of bed stays. To tackle this problem, the government could potentially introduce a system in which hospital beds are paid on the basis of diagnosis, as it already did with the Diagnosis Procedure Combination, implemented in university hospitals (Imai, 167). Finally, to address the problem of fragmented insurances the state could "integrate the national health insurance (NHI) funds at the prefecture level, which should…eliminate the horizontal inequity within prefectures." (Imai, 168)

The state could also decide to "[allow] for mixed financing between private and public health insurance" (Yashiro 40), although special care would need to be taken in order to preserve the accessibility and high quality of the services provided to users of public insurances. Japan has also begun to review the services offered to elders exclusively. In 2000, the government introduced the Public nursing carer insurance, a "long-term care for the elderly… now funded by insurance premiums" of people aged forty years and older (Yashiro, 33). This reform was introduced as a pre-empt to the issue of aging population, but also as a response to the fact that Japanese families have become increasingly less able to account for the needs of their elders (Imai *et al.*, 158).

Conclusion

To conclude, the stresses of an aging Japanese population will translate into difficulties with the financing of its universal health care system. A shrinking work force, combined with longer life expectancy, will result in the depletion of actual resources targeted towards financing health care. Japan thus has to rethink its methods of producing and delivering health care in order to make its system more effective. The process promises to be hard, with potential public and political opposition, and the worry that an increased debt-to-GDP ratio might threaten the financial wellbeing of the country. Japan appears to be on the right track though, with reforms to long-term care already underway. The Japanese population now needs to remember the issues at stake: some of its reforms might even inspire other 'developed' states, as these countries' health care finances, burdened by an aging population, begin to look like those of Japan.

The Middle East

Overview

Over the past few decades, states of the Gulf Cooperation Council (GCC) – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) – have experienced astounding economic development and rapid modernization. Overall health care quality and standards in the GCC have continuously improved with a decrease in infant mortality and an increase in life expectancy at birth. Consequently, urbanization and rising per capita income in the GCC have led to the consumption of unbalanced diets and more sedentary lifestyles, thereby aggravating the prevalence of lifestyle diseases. As such, the Gulf's prevalent health-risks are cardiovascular diseases, cancer, diabetes and obesity.

Cardiovascular diseases are the leading cause of death in the GCC. According to recent research conducted by the Duke University Medical Centre, the Middle East has one of the highest rates of cardiovascular diseases in the world, with 9 percent of adults on average having either died or suffered from heart attacks or strokes (Kronfol, 2012). In 2008, around 18 percent of all deaths in Saudi Arabia were caused by heart disease. Meanwhile, the disease was the primary cause of death in both the United Arab Emirates – where it accounted for 41 percent of all mortalities – and Oman. The prevalence of hypertension in Kuwait and Qatar has reached 26.3 percent and 32.1 percent respectively (Kronfol, 2012).

Colon and breast cancer are the most common types of cancer found in the Gulf States, with the latter more prevalent. In 2010, 20 percent of female cancer patients in the GCC were diagnosed with breast cancer. On average, around 5,000 Saudis yearly are diagnosed with breast cancer, typically discovered at an advanced stage due to inadequate disease awareness and surveillance.

Recently, the growing rate of diabetes has become a notable issue in the Gulf. In 2011, all GCC countries (with the exception of Oman) were among the International Diabetes Federation's list of top 10 most diabetic-prevalent nations in the world. The United Arab Emirates ranked highest among GCC countries of diabetes prevalence, while it placed second based on international ranking, with a prevalence of 18.73 percent. Saudi Arabia ranked third with 16.83 percent, Bahrain fifth with 15.43 percent, Qatar sixth with 15.39 percent, Kuwait eighth with 14.59 percent, while Oman ranked twelfth globally with 13.42 percent. In the UAE, Abu Dhabi's Ministry of Health stated in 2010 that 75 percent of its nationals' deaths were caused by diabetes. With three existing types of diabetes, the World Health Organization (WHO) reports the GCC as having the highest incidences of type 2 diabetes – which is most common among adults. Recent research reports indicate that 10.1 percent of adults in Kuwait suffer from Type 2 diabetes, with 12.7 percent of the population affected in Qatar, 13 percent affected in the UAE, and 14.3 percent affected in Bahrain. These Gulf States thus feature four of the top five highest proportions of Type 2 diabetes sufferers.

The high rates of prevalence of Type 2 diabetes are arguably caused by the overwhelming trend of obesity in the GCC. According to WHO, obesity is a major risk factor for diabetes and cardiovascular diseases. The Gulf States feature an extremely high obesity rate of 40 percent – one of the highest in the world. As such, the GCC is beginning to be recognized as one of the most obese regions in the world, with close to two thirds of the entire population of the region

being overweight in Kuwait. According to global obesity rates, 28.9 percent of males and 38.2 percent of females in Bahrain are obese, while in Kuwait 37.2 percent of males and 52.4 percent of females are obese, and in Oman about a quarter of adults (26.4 percent) are obese. Also, the International Association for the Study of Obesity reports Qatar having the highest rate of obesity among boys in the Middle East and North Africa (MENA). In Saudi Arabia, obesity is more problematic among women – as 29.5 percent of males are obese, while 43.5 percent of women are classified as over-weight.

From such statistics, it appears as though women are those who are disproportionately affected by the condition. Subsequently, obesity among children has begun to reach alarming rates in some GCC countries. Dr. Omniyat Al Hajeri, manager of Health Professional Licensing at HAAD (The Health Authority – Abu Dhabi) in the UAE, tested 190,000 nationals in 2010, and found that 30 percent of school children were overweight or obese. Of this population, he predicted that 70 percent are likely to remain overweight as adults.

As previously stated, the rise in chronic lifestyle diseases is attributed to the GCC's adoption of more sedentary and unhealthy lifestyles and diets. In consequence, the region has seen a spike in levels of non-communicable diseases like diabetes and obesity, while cardiovascular diseases remain a prevalent health-risk in the Gulf. Relatively recent, some argue this trend as the "New World Syndrome" – a theory that claims the discovery of wealth (oil in the case of the GCC) is linked to changing lifestyles.

Health Care Delivery

There are two distinct types of health providers in the Arab region: the public and the private sector. In the public sector, Ministries of Health (MoH) offer health care services. The GCC governments often play various and important roles in health care – from providing health services to regulating the industry and paying for new health facilities. In 2011, about 71 percent of healthcare spending was from public funds. Some GCC governments are looking to scale back as they seek to stimulate more private funding of health care, primarily through Public-Private Partnerships (PPPs). Private services are currently for profit and as such, limited in number and access to only those who have the ability to pay up front or through private insurance.

Investments by governments, as well as the private sector, have improved health care infrastructure in the GCC. Although many governments are building and upgrading healthcare facilities, the GCC continues to lag the standards of developed nations in terms of hospital beds, diagnostic labs, and medical training.

Emergency medical services are provided in most countries of the region through major public hospitals. Hospitals account for 40-70 percent of the national health budget in most Arab countries (Kronfol, 2012). Hospitals dominate health systems and provide concrete and visible health achievements for the public and for policy-makers in most countries. Moreover, hospitals are labour-intensive and employ half the physicians and two-thirds of the nurses in the region. In most Arab countries, government-owned hospitals are the reference places for tertiary care, training of human resources, and research.

House calls by general practitioners were very frequent in the earlier half of the 20th century in the Arab region. However, the rapid expansion of the populations in many cities, leading to traffic congestion, longer distances to travel to city suburbs and safety concerns, has contributed to a diminution in the provision of house calls. As such, health ministries in the Middle East have a strong urban bias in their distribution of medical and health services. Practically all secondary and tertiary care is provided in cities.

Amid rising demand for health care, Gulf States have announced plans to ramp up infrastructure. Strengthening health care infrastructure would boost overall expenditure as well as per capita spending through improved services at new facilities. As such, growing expenditure on health care coupled with infrastructure expansion and regulatory reforms will continue to improve health care standards in the GCC, including accessibility to health services. Saudi Arabia for instance spends the most on healthcare in the GCC, and thus has the largest health infrastructure. In fact, Saudi Arabia has more hospitals and hospital beds than all other GCC nations combined, with 408 hospitals featuring 55,932 beds in 2009.

Despite proposed advancements in health care infrastructure, up to an estimated 100 million citizens of the Arab region lack regular access to essential medicines (Kronfol, 2012). Ministries of health are responsible for ensuring the provision of safe vaccines to each Gulf state. Immunization is usually carried out in governmental facilities such as health centres and dispensaries, as well as inside of physicians' private offices.

Qatar Advisory Council approved a law in 2011 to liberalize the medicine market and eliminate monopoly among distributors. The law allows more players in the market subject to the Qatari Supreme Council of Health's control. The law is part of a study conducted to identify domestic market requirements and solutions for shortages and unavailability of medicine in Qatar. Conversely, the UAE's Ministry of Health has decided to maintain a firm regulation of medicine prices. In an attempt to combat issues of accessibility, the country's Health Minister agreed to reduce the prices of 67 medicines between 5 and 40 percent in 2011.

The GCC is highly reliant on expatriates – foreign medical professionals – including physicians, specialists, dentists, and nurses for the provision of healthcare. The shortage of home-trained medical professionals is another major problem in the GCC. As there are limited medical education options in the region, health care organizations must depend heavily on expatriates, who are estimated to account for between 40 and 80 percent of the total workforce. Currently around 20 qualified physicians serve every 10,000 people, compared to approximately 27 doctors in the US and UK systems – indicating a shortage of about 180,000 physicians. Additionally, according to WHO, the MENA region has 28.4 nurses per 10,000 people, which is nearly 71% lower than in the US.

Increased demand has improved the overall quality and standard of health care services in the GCC. Several international players entered the market with advanced facilities and technologies to tap growing opportunities in GCC health care. These firms function in various capacities. For example, Starcare Health operates individually, while Sagar Polyclinic works in partnership with Oman Holdings International. The UAE has been perhaps most successful in attracting international educational partnerships. Abu Dhabi Health Services Company (SEHA), a public

stock company that owns and manages operations of Abu Dhabi's public health care facilities, has partnerships with the Cleveland Clinic, the Johns Hopkins School of Medicine, and the Medical University of Vienna. With the presence of such educational partnerships, the exchange of innovations and best-practice care techniques should foster improved standards of health.

Latin America

5

Overview

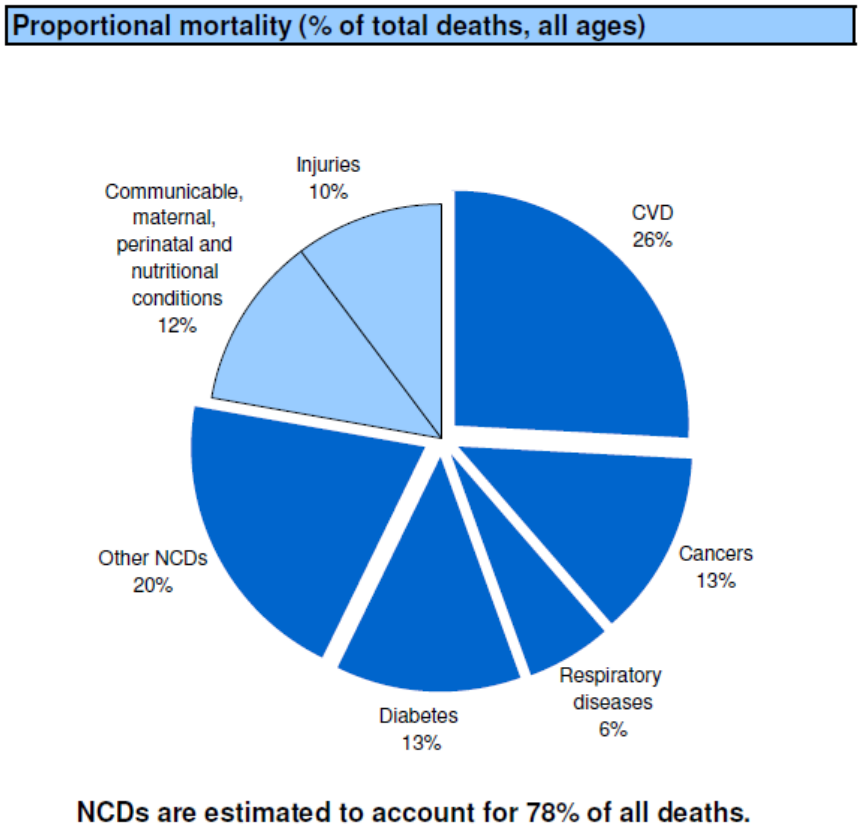
Developed South American countries including Chile experience the largest Disability Adjusted Life Years (DALYs) due to non-communicable diseases including ischemic heart disease, lower back pain, stroke, and major depressive disorder (IHME, 2010). Neighboring countries including Argentina and Uruguay feature similar DALY figures, highlighting the presence of a geographic cluster whereby regions of central and southern South America tend to share a similar burden of disease (IHME, 2010).

Less developed Central American countries including Guatemala feature a vastly different disease profile as the largest share of DALYs occurs as a result of communicable and congenital diseases including lower respiratory infections, diarrheal diseases, and preterm birth complications (IHME, 2010). The aforementioned clustering of DALY figures also appears in Central America with Honduras, Guatemala, and Nicaragua sharing six of the top ten causes of morbidity and mortality in 2010 (IHME, 2010).

As disease profiles tend to vary with levels of development, parts of Latin America face a double burden of disease. The interrelation of communicable and non-communicable diseases can also be found on a national level, with Brazil among the foremost countries to be double-burdened. Featuring a great degree of economic inequality, evidenced by a GINI index score of 54.7, Brazil has extremes of both wealth and poverty (Todaro, 2008). Within the wealthier classes, non-communicable diseases tend to be the most common causes of mortality. In contrast, impoverished residents of urban shantytowns (favelas) and underdeveloped rural districts are more likely to be plagued by communicable diseases and infections (Todaro, 2008).

Transcending the epidemiological clustering of disease are the effects of injury. When assessing the global burden of disease in the Latin American and Caribbean region, interpersonal violence and road injury aggregate to account for a Disability Adjusted Life Year figure of close to 14 million. When compared to the 8.5 million DALY figure garnered by ischemic heart disease, the scope of impact caused by injury is illuminated. Resulting from varying levels of political stability and infrastructural development, injury is often marginalized in the assessment of morbidity and mortality in Latin America.

According to the World Health Organization (WHO), non-communicable diseases (NCDs) are estimated to account for seventy-eight percent of all deaths in Mexico, representing one of the country's largest health challenges (WHO Mexico, 2011). As indicated by the chart below, cardiovascular disease accounts for twenty-six percent of deaths in Mexico, followed by diabetes and cancer at thirteen percent each.



Source: Mexico. (2011). World Health Organization -- NCD Country Profiles

As a rapidly industrializing country, Mexico is unique in that it straddles health challenges confronted by countries in both the developed and developing world. With the increasing prevalence of NCDs, Mexico is experiencing a paradigm, which the WHO refers to as the transition from "diseases of poverty" to "diseases of affluence" (Frenk et al, 2006). Indeed, Frenk et al (2006) notes how between 1950 and 2000, the proportion of Mexican deaths attributable to infectious diseases decreased from 50% to 14%. In contrast, the proportion of deaths attributable to non-communicable disease increased from 44% to 73% during the same period (Frenk et al, 2006). As is common in the epidemiological transition, economic growth has prompted a shift in the primary cause of mortality from infectious to non-communicable disease.

Health Care Delivery

Directly addressing Millennium Development Goals four and five, both Brazil and Mexico developed state-funded systems to incentivize maternal and child health. Through the Bolsa Familia and Oportunidades programs, conditional cash transfers have been adopted to promote health screenings and preventative care among vulnerable populations. The tangible results afforded by such programs could serve as a model for other countries of Latin America as issues relating to maternal and child mortality are present in many of the region's low and middle income countries (Todaro, 2008).

Further Latin American health care innovation has come by way of e health systems (WHO, 2006). Such infrastructure, often co-existing with national health care plans, works to improve health service accessibility, particularly among vulnerable populations. Since 2003, Mexico has provided information on health not only to medical professionals, but also, to the general public through an e health portal (WHO, 2006). The National Telehealth program launched by the ISSTE in 1996, has expanded health care by working in association with rural clinics. Concurrently, the eMexico health program has facilitated the acquisition of medical appointments, and coincided with the national digital archive system to encourage scientific research (WHO, 2006).

Overview

One of the most significant health risks in the United States is obesity. With 31.1% of men and 33.2% of women considered to be obese, the US has the highest rates of obesity among OCED nations (O'Neill, 2007). In 2001, the US Surgeon General identified a correlation between the obesity epidemic and premature morbidity. With a host of co-morbid disorders, obesity imposes a large burden on the American health care system (U.S. Department of Health and Human Services, 2001). The rate of obesity has increased across all ages and genders in the United States, reaching what many consider to be epidemic proportions (O'Neill, 2007). Left unaddressed, the Surgeon General estimates that the effects of obesity may soon eclipse those caused by cigarette smoking, eradicating many gains that have been achieved in controlling rates of non-communicable diseases such as cancer and diabetes (U.S. Department of Health and Human Services, 2001).

High investment in the health care system has resulted in rising life expectancy rates and fewer cases of infant mortality over the last thirty years, two measures which O'Neill (2007) suggests are the result of improvements to overall health (McGlynn et al, 2003). Rates of communicable and infectious diseases have also dropped. The top leading causes of death in the United States are chronic and non-communicable diseases (NCDs). Heart disease, cancer, lower respiratory infections, and diabetes, many of which are correlated with lifestyle risk factors, account for sixty-two percent of all deaths in the United States (Murphy et al, 2010; Murray et al, 2006).

In Canada, an aging population structure has led to an increased vulnerability to non-communicable diseases (Irvine et al, 2013). Cancer, ischemic heart disease, diabetes, and stroke are particularly prevalent in Canada, with heart diseases being the leading overall cause of death in the country (IHME, 2010). With a prevalence of close to two and a half million, Canadians are increasingly likely to be diagnosed with diabetes. Such rates are compounded by the fact that 34% of Canadians are considered to be overweight, with 26% percent having a Body Mass Index (BMI) associated with obesity (Public Health in Canada, 2013).

Cases of tuberculosis, while significantly decreasing in Canada as a whole, continue to disproportionately affect certain populations, such as foreign–born and Aboriginal Canadians (Public Health in Canada, 2013). Sexually transmitted infections (STIs) also pose a significant public health risk. Over the past 15 years, rates of reported STIs have steadily increased in the Canadian population. Correspondingly, rates of Canadians living with HIV increased by eleven percent between 2008 and 2011 (Public Health in Canada, 2013). An often-underreported issue, the *Mental Health Commission of Canada* (2012) estimates that mental health illnesses affect one in five Canadians in any given year. Due to the stigma associated with such illnesses, the actual figures may even be higher than those reported (Mental Health Commission, 2012).

Health Care Delivery

The American health care system has both public and private features, with Medicare and Medicaid being the two predominantly public health care programs. Other public programs include TRICARE and the *Veterans Health Administration*, which provide care for military

personnel and their families (Irvine, 2013). The federally funded Medicare primarily serves Americans over the age of sixty-five, while Medicaid is a joint federal-state program designed to cover the health care needs of lower income families (Irvine, 2013). Challenges have surfaced with longer life expectancy and rising health care costs straining funds earmarked for Medicare assistance. Medicaid has also faced struggles, particularly with issues of eligibility and discrepancies in services provided. Variable reimbursement rates have even led to some unwillingness on the part of physicians to take on Medicaid patients (Irvine, 2013).

With coverage rates of 72% in 2000 and 64% in 2010, the amount of Americans with private health insurance had been dropping steadily before the introduction of the Affordable Care Act (Irvine, 2013). Although the US spends more on health care as a percentage of GDP than its OECD counterparts, inefficient expenditures have often serve to limit health-related effects. Anderson et al (2003) speculate that part of the reason for this inefficiency is more expensive medical wages, equipment and pharmaceutical supplies. While Canadians have longer hospital stays than Americans, on average, American hospital services tend to be more expensive, due to more intense treatments and systemic inefficiencies (Anderson et al, 2003).

Despite the diversity of public and private health insurance programs, nearly 50 million Americans, or 15% of the population, lack health insurance (Irvine et al, 2013). Around seventeen percent of US citizens under the age of 65 do not have any health insurance coverage. Many cited cost as being the main reason for lacking insurance (Adam et al, 2011). In 2011, one in three Americans identified as members of families who were experiencing financial burdens relating to medical costs, a rate which was increased amongst older Americans (Cohen et al, 2012) Such burdens often have fatal consequences, with many individuals delaying diagnosis until later stages of illness, or being compelled to seek treatment in the emergency room instead of preventative care clinics. Correspondingly, premature death is seventy percent higher among Americans lacking health insurance (Irvine et al, 2013).

Health care services are delivered by province in Canada, making provincial health cards necessary. New immigrants to Canada must wait three months before being issued a Medicare card. Primary and secondary health care facilities, including hospitals and walk-in clinics, are largely concentrated in urban areas, presenting challenges of accessibility to Canadians living in remote or rural areas. While Canada as a whole features 2.4 physicians and 9.3 practicing nurses per 1,000 people, rural parts of the country have far fewer human health resources with an estimated .79 physicians per 1,000 people (Irvine et al, 2013).

While a variety of clinics and hospitals are available to all Canadians, challenges exist with acute emergency room wait times. O'Neill (2007) notes how the "free" healthcare system has necessitated Canada to ration health resources, making wait times higher. Mortality from cancer is also slightly higher for Canadians when compared to Americans. Of recent, there has been an explosion of private clinics, which charge both patients and the government for medical procedures and services. Supporters of such systems maintain that diverting those who can afford out-of-pocket medical services helps alleviate acute wait times. Critics of the two-tier system have countered that the migration of health workers to highly remunerated private clinics erodes resources available to the public system and in fact exacerbate wait times (Glauser, 2011).

Overview

In the European Union, chronic diseases are the leading causes of death, among which include ischemic heart disease, stroke, and cancer (Mladovsky et al., 2009). For heart disease, there are considerable gender and regional mortality gaps, with the highest prevalence among men in Central and Eastern Europe. Over the past number of years, these death rates have fallen, whereas cancer incidence has increased. There are large variations for cancer death rates across countries, with the highest rates found in Hungary, the Czech Republic, Denmark, Ireland, and Sweden.

Diabetes, lower respiratory infections, and liver disease are also noteworthy NCDs affecting the European Union. About 50% of people with diabetes are unaware of their condition. Diabetes is a risk factor for vascular disease, which also causes high mortality on its own. Lower respiratory infections are prevalent across much of Europe, with mortality rates for men two to three fold higher than those for females. A gender gap in disease prevalence is also present with liver disorders, which affect men primarily, resulting from alcohol consumption. Eastern Europeans and more specifically those countries, which were once a part of the USSR, have some of the highest levels of cirrhosis (Mladovsky et al., 2009).

Mental health is believed to account for a sizable proportion of the health burden across Europe. Major Depressive Disorder alone was estimated to have accounted for some 5.1 million DALYs in Europe and Eurasia (IHME, 2010). Governments of the European Union are increasingly recognizing mental health issues as a priority area, although information and data collection about mental health is still lacking in much of Europe. As such, the availability of services dwarf needs in many European nations.

Overall, the causes of the main chronic disease epidemics are well established and well known, with the most significant preventable risk factors coming from tobacco use, unhealthy diet (including excessive alcohol consumption and excessive caloric intake) and physical inactivity (Mladovsky et al., 2009). These life habits in turn are expressed through higher blood pressure, glucose and cholesterol levels, and higher rates of obesity.

In Europe, those who most often struggle with health care accessibility are the elderly, migrants, women, and minority ethnic groups (Scheiladlung & Kuhl, 2011). In Bulgaria, 46% of the Roma population has no health insurance, due to eligibility criteria. In the United Kingdom, 47% of all migrants are not covered by standard employment-based social health protection. (Avato et al., 2010). Migrant women and those of marginalized ethnic groups particularly struggle to receive proper health care.

Health Care Delivery

European countries rely on both public and private health care systems (OECD/European Union, 2010). On average, more than two-thirds of private funding is accounted for by out-of-pocket payments. For all western European countries, the public sector is the main source of health financing, with private health insurance accounting for only 3-4% of total health expenditure. Over recent decades, there has been a convergence of public health care spending across the entire continent (OECD/European Union, 2010). While the public sector covers the major share of overall health expenditures, it does not play a dominant role in every area of health services. Dental care, for instance, receives two-thirds of its revenues from private sources and medical goods (e.g. pharmaceuticals) are mostly paid for via private funds.

Recent studies conducted at the national level have measured equity in access to health care services. In the United Kingdom, it was determined that higher income citizens are more likely to seek primary care, an effect especially apparent amongst women. The rich were also shown to disproportionally access specialist services across Europe, most evident in Finland.

Influenza is one of the most pressing issues of public health in Europe. Immunization against seasonal influenza for the elderly, patients with chronic diseases, and other at-risk groups has become increasingly widespread in European countries over the past decade (OECD/European Union, 2010). In 14 European countries, more than half of the population aged 65 years and older were vaccinated for influenza in 2008. That being said, a discrepancy exists across nations: vaccination rates range from lows of 21% in the Czech Republic and 26% in Slovenia, to over 75% in the Netherlands and the United Kingdom (OECD/European Union, 2010).

There are a number of factors that have contributed to the rise in influenza immunization rates in Europe. Patients and practitioners have a greater acceptance for preventive health services, public health insurance coverage for vaccines has improved, vaccines are being delivered by healthcare providers who are not physicians, and a series of public health measures have been put in place, including massive vaccination campaigns for at-risk groups. In contrast, reasons put forward to explain low vaccination rates in countries such as the Czech Republic include poor public awareness, inadequate insurance coverage for vaccination costs, and a lack of consensus within the medical profession about the importance of vaccination (European Union, 2010).

Access to high-quality services depends crucially on the size, skill mix, geographic distribution and productivity of the health workforce (OECD/European Union, 2010). Greece in 2008 had by far the highest number of doctors per capita, with 6 per 1000 people, nearly twice the EU average of 4, maintained by Austria, Italy, and Norway. The number of doctors per capita was the lowest in Turkey, followed by Poland and Romania. There are more specialists than generalists in all countries, except for Romania and Portugal. Health professionals can be salaried or self-employed. Physicians are mostly independent and self-employed, working at private practices or contracting with public hospitals to provide services (European Union, 2010).

Nurses are the most numerous health professionals, outnumbering physicians in most European countries (OECD/European Union, 2010). They play a critical role in providing healthcare not

only in traditional settings such as hospitals and long-term care institutions, but also increasingly in primary care and in patients' homes. Professional nurses can be subdivided into several role categories: registered nurses, clinical nurses, nurse anesthetists, nurse practitioners, public health nurses, and specialist nurses.

The health care sector is highly labour intensive and one of the largest economic sectors in the European Union – accounting for 17 million jobs (8% of all jobs) (European Commission, 2012a). The number of jobs increased by 21% (4 million new jobs) between 2000 and 2010. Even during the economic crisis, employment in the healthcare sector continued to grow. The field is projected to grow at a rate of 5% per year, higher than the European Union average of 3% for all sectors combined, with one million additional jobs projected to be created between 2010 and 2020 (European Commission, 2012a).

The health care sector is also facing major labour challenges. With much of Europe experiencing an aging population structure, there has been rising demand for medical care, specifically for the treatment of chronic disease. There is a struggle to keep up with such demand and to offer a sufficient workforce to meet the population's needs. The health care sector also faces an aging workforce, too few new recruits to replace retirees, and significant employee turnover due to demanding working conditions and relatively low pay (European Commission, 2012a). Most member states of the European Union are currently facing critical workforce shortages. In 2009, 30% of all doctors in the European Union were over 55 years of age and doctors are expected to retire annually at a rate of 3.2% by 2020 (European Commission, 2012a). In response to this, many countries have expanded nursing training programs and efforts to increase retention rates of healthcare professionals. The European Commission Action Plan seeks to help European Union countries work together to boost employment by improving health workforce planning and forecasting, anticipating future skills needs, improving recruitment and retention of health professionals, and mitigating the negative effects of migration on health systems (European Commission, 2012a).

Using digital tools and services for health, professionals can improve access to health advice and treatment in order to make health care systems more efficient and cost-saving (European Commission, 2012b). For instance, the Danish Health Data Network is a streamlined service for patients and health care workers that has led to cumulative savings of $120 million a year. It provides fast and efficient communication between patients, general practitioners, and social care professionals. The Danish information system has been cited as one of the most efficient e-health systems in the world, saving doctors an average of 50 minutes per day on administrative work and thus permitting more patient interaction. A recent study across the Netherlands, the United Kingdom, and Germany showed that home telemonitoring systems could improve survival rates by 16%, reduce days spent in hospital by 26%, and result in economic savings through nurse telephone support (European Commission, 2012b).

Case Study: Access to Health Care in Germany

Every health care system in the world is unique in its structure and in the way in which it evolved. Rarely, if ever, is this evolution a linear progression. Instead, the development of any health care system is riddled with obstacles and challenges based on the political, socio-cultural, and economic framework of each nation. The following presents a brief outline of access to health care in Germany; many insights can be gained from this particular nation in terms of the strengths and weaknesses of its health care system.

Access to Health Care

Access to health care can mean access to health insurance as well as access to medical care. Having access to health insurance, however, does not automatically guarantee access to medical care. In Germany. there are both public and private payers. While this system has many benefits (as shall be further discussed below), it also presents certain weaknesses. For example, reports on access show substantial improvements in waiting times for members of private plans, compared to those relying on public insurance (Göpffarth, 2012). Economists predict that these access problems will increase if cost containment efforts stay restricted to governmental programs (Göpffarth, 2012).

Strengths of the German Health Care System

Throughout the development of German national health insurance, its guiding principles have been, and still are, decentralization, solidarity, and the use of non-state operations (Altenstetter, 2003). Conservative forces in society, which include public and private employers, churches, and faith-based and secular social welfare organizations have strongly influenced health care in Germany. These conservative forces have been committed to preserving equitable access to quality medical services for decades, and nowadays they represent a strong foundation for the delivery of medical services and nursing care (Altenstetter, 2003).

The following outlines a number of lessons that can be drawn from an understanding of the German health care system. For one, the solidarity-based financing, rather than funding from general taxes, has been beneficial to both health and industrial relations in Germany. Secondly, mandatory long-term health insurance has provided access to nursing home care and other forms of non-medical care for the elderly, thus keeping them healthier and avoiding marginalization. Thirdly, business and labour leaders, federal and regional policymakers, and most segments of the German public remain convinced that solidarity is a better mechanism to resolve conflicts and secure access to health care than fierce competition and adversarial politics (Altenstetter, 2003). Lastly, solidarity, subsidiarity, and self-governance blossom under the following 5 conditions, which can all be found in Germany (Altenstetter, 2003): (1) The profit motive (especially as espoused by investor-owned insurance companies) is kept out of health care or at least kept to a minimum in order to save substantial sums, which would otherwise pay for marketing; (2) a community-focused and inclusive culture surrounding the delivery of care has to be emphasized; (3) countervailing forces (payer vs provider, federal vs regional) should be used and relied on for problem solving; (4) federal or regional offices should act as facilitators,

enablers, and monitors of last resort; and (5) the link between the voting public and elected officials should not be severed through special interest politics.

Weaknesses of the German Health Care System

No German citizen is without health insurance, and yet barriers to access do exist. In Germany, the main system of coverage is statutory health insurance, and complementary systems exist, which include governmental subsidy or compensation schemes, governmental schemes for asylum seekers, refugees and illegal immigrants, and private health insurance. There are three main barriers to access in general, namely, cost-related barriers to access, geographical barriers of access to health services, and organizational barriers (Riesberg & Wörz, 2008). Specific barriers to health care exist for particular groups living in Germany. Located at the heart of Europe, both politically and geographically, Germany is not only home to German citizens, but also, a considerable number of immigrants, refugees and asylum seekers. For these groups in particular, a multitude of barriers to health care exist. In a world that is becoming increasingly globalized a great number of different nations are facing the same challenge of integrating migrating populations, and ensuring access to health care is one of the most important parts of the problem. In Germany, barriers to health care for immigrants include coverage-related barriers, benefit-related barriers, cost-related barriers, geographical barriers, and demand-side barriers (Riesberg & Wörz, 2008). Demand-side barriers include health literacy, as well as differing beliefs about healthcare. Furthermore, cultural and language differences all represent further barriers to access to health care for immigrants.

Conclusion

The German health care system is grounded in solidarity, subsidy, and self-governance, and is a highly effective system for providing access to health insurance for German citizens. Disparities exist, however, between those with private versus public health insurance, as evidenced by the increased waiting times for the publicly insured. Furthermore, a multitude of barriers to access to health care exist, particularly for immigrants, refugees and asylum seekers.

Box 1: National Health Insurance at a Glance **(Göpffarth, 2012)**

Scope:
- no citizen is without insurance - 92% are covered by National Health Insurance, the rest are insured privately or are wealthy
- mandatory contributions into National Health Insuranc- choice of generalist physicians and specialists, dentists, hospitals, and long-term nursing care
- probability of coverage across all hospitals, doctors' offices, regions, and communities
- chip card serves as membership identification; medical and dental offices, hospitals, and specialized facilities must honor it
- choice of sickness fund
- about 7% of the population carries commercial insurance
- 7%-10% of those covered by National Health Insurance take out private insurance for amenities while hospitalized
- private health insurance is offered by about 50 companies

Coverage:
- working individual, their spouses, and their children
- retired persons
- unemployed
- all students, whether at community colleges, senior colleges, or universities
- in principle, children are covered until age 18 but, depending on whether a child works or is a student, can continue until age 23 or 25, respectively)

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8

Chapter 1

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