AN EVALUATION OF HEALTHCARE EXPENDITURE POLICIES AND DEVELOPMENT OF A UNIVERSITY-BASED SUSTAINABLE HEALTHCARE FINANCING MODEL

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by

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LIST OF ABBREVIATION

ACG	Average cost of health service incurred by government
ACP	Average cost of health service borne by patients
ADB	Asian Development Bank
ADMIN	Administrative costs
ATC	Anatomical therapeutic chemical classification
ATP	Ability to Pay
CBHI	Community-based health insurance
CIHI	Canadian Institute for Health Information
CONT	Contribution rate
CONTOTH	Other contributions
COPAY	Co-payment rates
DDD	Defined daily dose
DUR	Drug utilization review
FFS	Fee-for-service
GDP	Gross domestic product
GP	General practitioner
GSHI	Government subsidies for health insurance
GTZ	The German Organization for Technical Cooperation
HCF	Health care financing
HCFA	Health care financing administration
HEHI	Total health insurance expenditure
INT	Interests from reserves
LTTGI	Long-term therapeutic groups index

M	Percentage membership in health insurance
MDGS	The millennium development goals
ME	Percentage of exempted members
MSA'S	Medical saving accounts
MSH	Management Sciences for Health.
NDP	National drug policy
NGO	Non-government organization
NHE	National health expenditures
NIHCMF	National Institute for Health Care Management Foundation
NLED	National list of essential drugs
NY	Net income of the health insurance scheme
OOP	Out-of-pocket (payment)
OTC	Over- the-counter
OTH	Other non-health care costs
PGDP	Deflator of the gross domestic product
PHI	Private health insurance
POM	Prescription only medicine
POP	Component of total population
R	Interest rate
RES	Reserves
RM	Malaysian ringgit
RPM	Rational pharmaceutical management [project]
RUD	Rational use of drugs
RX	Prescription

SHI	Social health insurance
SIMINS	Health insurance simulation model
TCI	Total health care costs incurred
TCICOV	Health care costs to be covered by the health insurance scheme
TCNI	Total health care costs incurred by the non-insured
TCONTEP	Total contributions from government employees, employees and pensioners
TCONTSE	Total contributions from self-employed
TPOP	Total population
TREVHI	Total health insurance revenues
URI	Utilization rate for the insured
URNI	Utilization rate for the non-insured
US$	United states dollars
USAID	U.S. Agency for International Development
USM	Universiti Sains Malaysia
USMHC	Universiti Sains Malaysia's health centre
USMHC-A	Consultation only service category in USMHC
USMHC-B	Consultation & prescription service category in USMHC
USMHC-C	Consultation & prescription & lab test service category in USMHC
USMHC-D	Consultation & prescription & lab test & x-ray/scanning service category in USMHC
USMHC-E	Consultation & lab test service category in USMHC
USMHC-F	Consultation & x-ray/scanning service category in USMHC
USMHC-G	Consultation & lab test & x-ray/scanning service category in USMHC
USMHC-H	Consultation & prescription & x-ray/scanning service category in USMHC

USMPC	Universiti Sains Malaysia's panel clinics
USMPC-A	Consultation only service category in USMPC
USMPC-B	Consultation, treatment and medicine (include Antibiotics) for normal disease without injection service category in USMPC
USMPC-C	Consultation, treatment and medicine (include Antibiotics) and injection for normal disease service category in USMPC
USMPC-D	Asthmatic treatment and nebulization include consultation and medicine service category in USMPC
USMPC-E	Home visit service category in USMPC
USMPC-F	Minor operation includes consultation and normal medicine service category IN USMPC
USMPC-G	Medical examination include x-ray for potential employee before accepted service category in USMPC
W	Average annual wage or pension
WB	World Bank
WHO	World Health Organization

GLOSSARY

A beneficiary	Any individual who is eligible to utilise the university health care system
Capitation	Annual average cost of utilisation per each health service category or according to benefit package per each beneficiary category.
Costs	Costs used in this study refer to the accounting costs, defined as the monetary value of actual expenditures for the acquisition of goods or services
Expenditures	Operationally defined as the total costs of health service delivered for the university staff, students or dependants including the professional costs
Financial sustainability	Financial sustainability is measured as the average ratio (expressed in percentage) of operating expenses over revenues of the healthcare facilities
Health personnel salaries	Salaries that are paid directly by the Government are included in the recurrent costs
Health status	is the number of long therapeutic group drugs prescribed at least once for any patient
Location	Health center in USM main campus and all panels of clinics
Recurrent costs	Constituted by variable costs and fixed costs
Study variables	This study designed to model the health care cost per capita and the cost per visit and the average of the utilisation per capita.
Sustainability	the health care system is sustainable when revenue from its resources is equal to its health care expenditure or when the revenue from beneficiary and subsidies divided by expenditure equals one
Total costs	Represented by recurrent and capital costs. In this analysis only recurrent costs are considered because capital costs are borne by the Government
Trend analysis	The identification of patterns and trends are techniques used by analysts studying the supply and demand of an asset traded on an open market. A trend is the general direction of a price over a period of time. A pattern is a set of data that follows a recognizable form, which analysts then attempt to find in the current data. The trend meaning in this study is the pattern of

	usage
USM health care system	All USM health care facilities including USMHC and USMPC
USM policy	any plan or policy applied or reinforced to act as cost containment tool or to control utilisation and cost
Utilisation	Defined operationally as the total number of university student, staff, and dependant visits to the USM's wellness centre or to the panel of clinics.
Utilization rate	Defined as total number of health services done by all patients at a health center /panel divided by the total population of the (USM) per year. Other variables defined in methods of chapter 2 and 3
Variable costs	Costs which can directly be related to patient care use such as drugs and consumables while indirect costs cannot be directly attributed to patient care use such as salaries, water and electricity costs. The allocation of the fixed costs among members and non-members are based on their relative use of curative consultations (volume)
Variables	Several variables of interest are selected based on the research questions and hypotheses of the study. The rationale and the measurement of the variables to be included in the models for access to care and financial sustainability are described below:

PENILAIAN DASAR PERBELANJAAN PENJAGAAN KESIHATAN DAN PEMBANGUNAN SATU MODEL PEMBIAYAAN PENJAGAAN KESIHATAN BERASASKAN UNIVERSITI YANG LESTARI

ABSTRAK

Peningkatan kos penjagaan kesihatan adalah masalah di seluruh dunia. Menilai dan menambah baik sistem pembiayaan penjagaan kesihatan harus menjadi sebahagian daripada mana-mana agenda pembaharuan penjagaan kesihatan. Untuk mengimbangi akaun kesihatan semasa, terutamanya dalam kes defisit, tiga pembolehubah boleh diambil kira- subsidi kerajaan, ko-bayaran dan kadar caruman insurans itu. Dalam tesis ini, penilaian bagi sistem pembiayaan penjagaan kesihatan di USM dan model simulasi digunakan untuk menangani isu-isu dalam sistem pembiayaan penjagaan kesihatan USM semasa. Kemudian, memeriksa beberapa senario alternatif menggunakan model simulasi insurans kesihatan "SimIns", dengan memberi perhatian khusus kepada ramalan perubahan dalam perbelanjaan kesihatan dan kebolehlaksanaan pembiayaan perubahan tersebut. Secara keseluruhan, tesis ini adalah satu kajian keratan rentas yang terdiri daripada tiga bahagian. Bahagian Satu adalah penilaian dan kajian analisis kos untuk menilai model pembiayaan penjagaan kesihatan semasa di Universiti Sains Malaysia (USM). Keputusan bahagian satu menunjukkan isu-isu yang berpotensi dalam model pembiayaan penjagaan kesihatan semasa USM. Bahagian Dua tesis ini memeriksa kadar penggunaan kakitangan, pelajar, dan jabatan masing-masing dalam pelbagai dasar kawalan kos yang diguna pakai oleh USM. Kecenderungan penggunaan dan kos bagi semua perkhidmatan kesihatan yang disediakan oleh pusat kesihatan atau klinik panel telah dinilai.

Kategori penggunaan kesihatan telah dimodelkan dan kemudian digunakan sebagai input dalam bahagian ketiga untuk membina model pembiayaan penjagaan kesihatan yang mampan. Data yang diperlukan untuk bahagian ini telah diperoleh dari pangkalan data berkomputer USM yang menyimpan rekod perubatan elektronik (EMR) pesakit. Enam tahun kewangan bagi semua kakitangan, pelajar dan tanggungan mereka untuk kedua-dua pusat kesihatan USM dan semua klinik-klinik panel USM telah dikumpulkan. Bahagian Tiga tesis ini berusaha untuk membina dan membangunkan satu model pembiayaan penjagaan kesihatan yang mampan. Model simulasi insurans kesihatan (SimIns) yang dibangunkan oleh kedua-dua GTZ dan WHO telah digunakan. Pelbagai keadaan telah dibangunkan untuk mendapatkan model yang mampan untuk kakitangan dan pelajar. Dapatan bahagian ini akan berfungsi sebagai model pembiayaan penjagaan kesihatan yang cekap bagi USM atau konteks lain yang serupa. Tesis ini telah membuat kesimpulan bahawa perbelanjaan kesihatan meningkat di semua tahun. Sistem pembiayaan penjagaan kesihatan USM semasa, dari segi kewangannya adalah tidak mampan. Dasar USM berjaya dalam mengawal kos klinik panel (USMPC) tetapi terdapat perubahan untuk perkhidmatan rawatan kronik ke pusat kesihatan USM (USMHC) dan jumlah perbelanjaan USM terus meningkat. Model pembiayaan penjagaan kesihatan yang baru dibangunkan menyediakan data asas bagi USM dan juga penyelesaian jangka panjang dengan tiga senario. Senario ini menyediakan peningkatan dalam kualiti kesihatan dan membuat model pembiayaan penjagaan kesihatan yang mampan.

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ABSTRACT

Escalation of healthcare cost is a world-wide problem. Assessing and improving the healthcare financing system should be a part of any agenda for healthcare reforms. To balance the current health accounts, especially in the case of deficit, three variables can be considered- the government subsides, the co-payment and the contribution rate of the insurance. In this thesis, evaluations for health care financing system at University Sains Malaysia (USM) and simulation model were used to address the issues in the current USM healthcare financing system. Then, examine a number of alternative scenarios using health insurance simulation model "SimIns", by paying special attention to forecasted changes in health expenditure and feasibility of financing those changes. Overall, this thesis is a cross-sectional study consisting of three parts. Part one is an evaluation and cost analysis study evaluating the current healthcare financing model at USM. Part Two of this thesis examined the utilisation rate of staff, students, and their departments in the presence of different cost policies applied by USM. In this part, the trend of the utilisation and cost of all health services provided by the health centre or panel of clinics was evaluated. The health utilisation categories were modelled and then used as inputs in part three to build a sustainable model. The new health care schemes were built by modelling the health services provided by the USM health care system to their beneficiaries. The data required for this part were obtained from USM computerised databases, which

keep electronic medical records (EMR) of patients. Part Three of this thesis sought to build and develop a sustainable health care financing model. The Simulation health insurance model (SimIns) developed by both GTZ and WHO was used. Many scenarios were developed to obtain sustainable models for USM. The main finding were, from 2004 to 2009, the average health care utilisation rate per year for each beneficiary was 4.1±4.8 (3.0) visits. The average annual health care visit cost for each beneficiary was RM 96.2±225.3 (41.0). Based on the developed models, the total population will be grown over the next 10 years by 2.81% yearly. In the baseline scenario, the total revenue in the target year 2014 will reach to RM 4849 thousands while the total expenditure will reach to RM 4044 thousands. The fund sustainability will remain stable until the arrival year (2019) in which the total revenue will be RM 5615 thousand and the total expenditure will be RM 5058 thousands. In scenario two, the balance is deficit in the arrival year. The total revenue in the target year 2014 will reach to RM 4849 thousands, while the total expenditure will reach to RM 4044 thousands. However, by 2017 the fund will be unsustainable until the arrival year 2019 in which, the total revenue will be RM 5620 thousand and the total expenditure will be RM 6017 thousands. In scenario three, the balance will be surplus from the year 2010 until the arrival year of the projection. This will be achieved by implementing the copayment which will increase the revenue and at the same time will reduce the number of unnecessary visits. This thesis concluded that the health expenditures increased across all years. The current USM healthcare financing system is financially unsustainable. The USM policies succeed in controlling cost of panel clinics (USMPC) but there was a shift for chronic treatment services to USM health centre (USMHC) and the total expenditures of USM

continued increasing. The new developed healthcare financing model provided a baseline data for USM as well as long term solutions with three scenarios.

CHAPTER ONE

INTRODUCTION

1.1 Background

According to Donabedian 2005, there are three different aspects of quality: structure, process, and outcome. He suggested that 'a good structure increases the likelihood for getting a good process; a good process increases the likelihood for getting a good outcome'. Structural quality concerns organisational structure, personnel and other resources, while process quality concerns what happens to the patient during care and outcome quality concerns the utility of care for the patient (Donabedian, 2005).

Health constitutes the biggest economic sector worldwide with steep increases in rates. Health is created – by and large – outside the health care sector. Education, the socio-economic situation, the physical environment, nutrition and housing play an important role in creating public health. While 30% of the population's health is produced by the health care sector, this represents a huge market of currently about 3.4 trillion USD globally (Babiker, 2006).

The dramatic increase in health care costs in the last two decades has attracted the attention of policy makers, planners, and researchers. Looking for mechanisms of proper and effective financing of health care are some of the most important debates of governments worldwide. Although this problem affects developed countries as well, it is more acute in developing countries due to their low ability to collect as high a proportion of their gross domestic product (GDP) in taxes (Mariam, 2003). For instance, in the United States, total health care spending reached $1.2 trillion, an increase of 5.6% over the previous year (Liu and Romeis, 2004) . In

Oregon more than $10 billion was spent on health care in 1993, more than twice that in 1988 (Reller and Sahn, 1995). On other hand, during 2001 to 2011, the total personal health expenditure grew from $1.3 trillion to 2.3$ trillion in USA (National Center for Health Statistics, 2015). Health spending as a share of GDP in Korea increased from 2.8% in 1975 to 4.3% in 1986 and 7.1% in 1991 (Peabody et al., 1995). In other study in Korea, from 1990 to 1998, the average annual rates of increase in expenditure for medical supplies and pharmaceuticals per claim case were 13.6 and 11.4%, respectively, both of which are greater than the average annual rate of increase in total medical expenditure per claim case, 8.2% (Kwon, 2003).

An analysis of the financing system for health care encompasses the way the provision of a national health care system is financed, the way patients pay for services, the way providers are reimbursed, the way business is allocated etc. (Brennan Joyce et al., 2000). When making decisions related to financial sustainability, one must answer the question: *What should I do now to make my organisation more financially stable in the future*? The answer could be to reduce costs, to increase revenue, to consider changes in demand and the cost of input, or a combination of all to obtain all three advantages at one time (MSH, 1998).

Globally, three main options exist for financing health: (1) a government budget allocation, (2) out-of-pocket payments, and (3) prepayment schemes or health insurance. Government budget allocations come from general tax revenues, both direct and indirect taxes. Studies have shown that low-income countries have a smaller tax base and that their governments are less able to collect taxes. The amount of allocation therefore depends on the extent to which revenues can be collected and on the importance given to health in comparison with other sectors. Out-of-pocket payments include fees paid directly by patients when they seek treatment, e.g.

consultations, traditional medicine, and pharmaceuticals. Patients are not reimbursed by another party. User fees/direct payments are easy to administer and are an important source of revenues for health facilities and providers. However, people who cannot afford to pay are denied access to care (Kutzin, 2001).

In addition, user fees and direct out-of-pocket payments foster inappropriate utilisation of health services. Prepayment schemes/health insurance includes mandatory insurance, which tends to be relatively progressive (in other words, they are usually linked to income so poorer people pay less), and voluntary insurance, which tends to be relatively regressive (payments are not determined by income, meaning that poorer people pay a higher percentage of their income). Mandatory insurance leads to greater financing fairness, so the main challenge is to expand prepayment schemes and health insurance to the informal sector, the rural population and the poor (Kutzin, 2001).

Addressing the issue of sustainable health care financing is a public health matter of utmost importance. At least 1.3 billion people worldwide lack access to most basic health care. Often it is because they cannot afford it. As a result, millions become very sick or die every year from preventable or curable medical conditions. For example, the toll from treatable infections and preventable complications of pregnancy and delivery is more than 10 million deaths each year (Thomson et al., 2009).

Also each year, 100 million people slide into poverty as a result of medical care payments. Another 150 million people are forced to spend nearly half their incomes on medical expenses. That is because in many countries people have no access to social health protection – affordable health insurance or government-funded health services. Paradoxically, people in the world's poorest countries

contribute relatively more for health care than those in wealthy industrialised nations. In Germany, for example, where the average GDP per capita is 32,860 USD and almost everyone has social health protection, 10% of all medical expenses nationwide are paid directly 'out-of-pocket' (Laaser and Radermacher, 2006). In Indonesia, by contrast, where social health protection is scant, about 70% of the money spent on medical care is paid directly by households. But, In January 2014, the Indonesian government launched Jaminan Kesehatan Nasional (JKN), a scheme to implement universal health care in Indonesia. It is expected that spending on healthcare will increase by 12% a year and reach US$46 billion a year by 2019. Under JKN, all Indonesians will receive coverage for a range of treatments via health services from public providers as well as those private organisations that have opted to join the scheme (Britnell, 2015).

A question with huge public health implications is therefore how national health systems can ensure universal coverage. Universal coverage is defined as access to key promotive, preventive, curative and rehabilitative health interventions for all at an affordable cost. One of the crucial factors for achieving effective universal coverage is to improve the quality of provided health services and interventions. In a similar way, the extension of social protection in health is a key strategy to remove financial barriers to access health services and preventing people from the impoverishing effects of catastrophic health expenditures thereby reducing poverty. This strategy involves a move towards enhanced risk-sharing and risk-pooling, thereby increasing the amount of prepayment and reducing the reliance on out-of-pocket payments. Besides protecting people from the direct costs of illness, health financing through collective arrangements provides financial resources to

diagnose, prevent and treat illness and promote better health (Laaser and Radermacher, 2006).

The concept of social health insurance, as one of the major options for financing health systems and providing social protection in health, is firmly based on specific values, such as solidarity and equity, which in turn can contribute to social justice. The principle of solidarity constitutes the fundamental underlying value.

According to the principle of solidarity everyone should have access to an adequate benefit package and no family should be financially burdened by illness. The principle of solidarity is directly related to equity in financing and financial risk-protection. The former entails that people contribute on the basis of their ability to pay rather than according to whether they fall ill. The latter ensures that the cost of care does not put people at risk of financial catastrophe. Social health insurance allows for flexibility in establishing governance and responsibilities, either in a single or multiple fund structure with different degrees of autonomy. It often involves a wide range of actors, thereby strengthening participation and decentralisation in social health protection as well as disburdening governments. In this context national and social dialogue is crucial for assigning roles and responsibilities (Laaser and Radermacher, 2006).

A health financing process will look differently in every country and change with the economic and institutional development of the country. Not every feature deemed desirable can immediately be obtained at every stage of the development of the system. Although, for instance, pooling of resources makes the system more efficient it cannot be implemented from one day to the other. However, it is important to set the course for development serving the achievement of the overall health system objectives (Radermacher and Laaser, 2006).

The financier should be in a position to negotiate deals with providers and to have a choice of which providers to use. In order for such negotiations to take place in an open and market-oriented manner, there should be competition between providers. Otherwise, the financier would be trying to negotiate with a monopoly, which is highly unlikely to be productive. If primary care in isolation was examined, the recommendations could well reduce the cost of primary care but could increase the cost of secondary care, and provide no increase in value overall. The financing of primary care should be integrated with the financing of secondary care. The financing system for primary care should be designed to maximise value for money in the total health care system. Utilisation databases are useful for evaluating the clinical and economic effects of drug reimbursement policy changes because they measure actual utilisation and economic outcomes accurately, are broadly representative, and are large enough to detect small changes in major clinical outcomes (e.g., diagnosis-specific ER admissions). Interrupted time trend analyses implemented in longitudinal databases can provide implicit adjustment for most patient and provider characteristics (Schneeweiss and Avorn, 2005). Such database studies were able to quantify the expected drug utilisation changes after drug reimbursement restrictions (Tamblyn et al., 2001) and detected increases in nursing home admissions (Soumerai et al., 1991) and temporal increases in physician visits following such restrictions (Schneeweiss et al., 2002).

The simulation model was absolutely a key in demonstrating to our stakeholders that the capacity is there to serve our community's emergency needs. Simulation solutions provide senior health care decision makers with the ability to test changes in their organisation, in a risk free environment, prior to implementation in practice.

Given the importance of studying and the tools to analyse health care finance systems, this study sought to analyse the current health care financing at USM and hence to build a sustainable health care financing for USM.

1.2 USM'S health system and policy for years 2000-2009

1.2.1 Health care system at USM

The health care system at USM main campus is primary health care (PHC). For most people, PHC is the first point of contact with the health care system, often through the health centre at USM. It is where short-term health issues are resolved and the majority of chronic health conditions are managed. It is also where health promotion and education efforts are undertaken, and where patients in need of more specialised services are connected with secondary care.

The USM health care system provides health services to its entire staff and their dependants (free-of-charge – to a certain extent) and for its registered students and their dependants after they pay a health service fee per academic session. Health services are provided either through USM health centre or through USM panel of clinics and pharmacies including public hospitals (acute & chronic diseases). In addition, health services are provided for staff by private hospitals, if it is impossible for USM health centre, panel of clinics or general hospitals to provide, due to unavailability of such services or there is strong justification for any operation not available at USM or panel of clinics or in the general hospitals.

The first policy for students began on the first of June 2004 and was restricted to six visits per year. If the student exceeded six visits, he/she would pay the fees required out-of-pocket to the provider. However, the student's dependants were ineligible to access the panels unless they paid out-of-pocket. With regard to USM

payment system of the claims for providers, it is through fee for service contracts based on standard prices.

However, from January 2006, the current policy has been implemented in which USM's staffs is provided health services through either the health centre or a USM panel of clinics and pharmacies according to the following conditions:

- ✓ Unlimited visits for acute diseases;
- ✓ No chronic medicines from panel of clinics (chronic diseases only through USM health centre and public hospitals if necessary);
- ✓ Maximum cost for each Rx from panel of pharmacy only RM 25.

A recent new policy for students was started on 1st July 2008. According to this policy, compulsory medical insurance for emergencies, surgical interventions and accidents is applied for all new local (optional) and international students through private insurance companies according the following conditions:

- ✓ No free health care service for students or their dependants out of USM's health centre or panel of clinics;
- ✓ Only medical insurance holders can register in USM and can access any health providers scheduled in medical insurance scheme but can access USM'S health centre and panels or;
- ✓ Students and their dependants can access only the health care plan determined in the medical plan of health insurance companies according to the schedule of benefits.

1.2.2 Overview of health care scheme for USM for years 2000-2009

Apart from hospital services offered by the Malaysian government for its population, USM offers PHC services to its beneficiaries through its Health Center (USMHC) located at the university campus and through a panel of private clinics

(USMPC) and pharmacies. USM beneficiaries are staff of USM, their spouses and children as well as USM students, their spouses and children.

1.2.3 USM's health expenditure policies for years 2000 to 2009

Policy makers and planners decided to introduce some changes in the USM's old health policy, so as to control the service utilisation rates and expenditures without affecting students' and their dependants' access to medical services. To achieve these objectives, they (policy makers) limited eligibility of students to use panel clinics services to only six visits per academic session, which will be paid for by the university, and the students have to pay the full fee at the seventh visit and above. Students, in order to ensure access to health care, were allowed to use the university health centre unlimitedly (refer to the old and new health policy in (Appendix C). In other hand, staff and their dependants can use all USM's health system free of charge. Staff and their dependants can access to USM's health centre, panel of clinics and pharmacies unlimitedly, but no chronic disease treatment provided through panel of clinics started from 2006. Students' dependants were not allowed to use the USM panel of clinics, and they have to use the health services at the USM's health centre during its operational hours and at government clinics and hospitals after operational hours of USM's health centre and during public holidays.

Other than the mentioned new regulations in the new policy, everything in the old policy and regulations remained, i.e. the new policy and regulations are additions to the existing one (the old policy).

The new USM health policy was introduced aiming to contain health care costs. It has some similarities to many methods used in cost containment, but it does not fit a certain one completely; for instance, students pay fixed payments in advance (prospectively) for covering of all their health care services (which will be provided

by panel clinics -6 times- and the university clinic), per a certain period of time (per academic session), which is similar to capitation payment systems mentioned above. The new policy differs from capitation systems in that the payments are paid to the university (the payer), while in capitation systems the payments are paid to the provider. So, the payer is still at a high risk, unlike capitation systems, where the risk will be transferred to the provider. On the other hand, the university pays the panel clinics (provider) variable payments, retrospectively according to the quantity and quality of services provided to its students, and the claims will be paid upon receiving them, which is similar to FFS payment systems. The difference from FFS systems is that students' visits to the panel clinics were limited to six visits per academic session, while in FFS systems the payments are for unlimited visits.

The USM new health policy was aiming to use the advantages of different cost containment mechanisms and avoid their disadvantages; for instance, FFS payment systems - as mentioned above - encourage offering the best quality of care, but they have the incentive of overproduction of services (for profit maximising providers); when a cap (ceiling) was determined (6 visits), this can control the undesired effects of FFS systems. Also for capitation payment systems, they have high potential for cost containment, but may have an incentive for underproduction of appropriate services, because the provider was at a high risk if the cost of services provided exceeded the capitated rate; the new policy shifted the risk from the provider to control capitation systems' adverse effects.

This study also discusses the USM new health policy's success or failure in containing health care costs based on its effects on utilisation rates and expenditures of health services.

1.2.4 Healthcare financing model in USM

Health is an integral part of the concept of the development of any country. This is one of the most important Millennium Development Goals, which lists the health issues of interest. Malaysian citizens have good health indicators and the Universiti sains Malaysia community has been entertained by such indicators and the community, with indicators of economic, social and health being better than others in Malaysian society. Generally, the university community is made up of staff and non-academic individuals. Most of these have the highest qualifications and high disposable income, but there is a scale, as a significant proportion of ordinary workers are from low-income families. Also, the families of these workers, whether they are adults or children, enjoy the same health coverage offered by the University either directly or indirectly. In addition, the university community mostly consists of students who are educated and young, and enjoy excellent health and wellness. A small portion of students who are graduate students have their families with them and may be Malaysian citizens or foreigners who are mostly from around the world. These students have good health indicators, but their economic indicators are somewhat closer to the layer of low-income employees, but in relative terms. The Malaysian government has worked on the implementation of the Millennium Development Goals and the five-year plans to achieve better health standards next to social and economic standards. For this, the Malaysian government is working to create an economic system within a sustainable health system. The Malaysian government is planning to gradually use many of the mechanisms for financing healthcare, such as: Government budget allocations, fees for services, prepayment schemes or health insurance. Recently, the government has stressed the need to "develop policies on allowances and health insurance for the poor, and gradually

progress towards universal health insurance". This position was also reflected in development plans and the growth strategy of the Government of Malaysia, especially the goal of 2020 in Malaysia, which should be one of the developed countries. However, there is no specific strategy or master plan for the implementation of the stages of these long-term goals, but the government is starting to promote the sustainability of their regions, organisations and countries; the application of new models for healthcare financing in this region or organisation can be an example for other regions, and finally for countries. Reviewing various options for health financing shows that in the current economic circumstances, the best course of action is to increase the health budget and the government should expand health insurance coverage as well. This is also the most appropriate way to contribute to the protection of the heritage of past achievements, and improve equity, whilst moving towards the goal of universal coverage. The main challenges that affect the expansion of the current health insurance system include: strengthening the legislative framework and capacity-building and Social Security Agency, redefining the role of the Ministry of Health and improving coordination within the framework that helps to satisfy service providers and consumers regarding healthcare (Drouin, 2007, Cai, 2007).

1.3 Problem statements

Sustainability of financing health care is an international target for decision makers, especially in developing countries which have limited budgets and scarce resources which do not satisfy the continuous growing health expenditures and increasing demand for health services while the revenues represent a small proportion of expenditures. These efforts encourage building a sustainable health

care financing models particularly models that protect people from the financial risk and sharing people at risk by expanding the converge of the most proffered model of financing called the security model or social health insurance model of financing. Also this effort is the same for the USM health policy makers, i.e. limited budgets and scarce resources. The main resources of health care financing is the government which is not sustainable and steady while the number of staff, retiree and students increase annually which leads to increases in the expenditures and utilisation of health care. The revenue from people at USM including staff and students represent only 5% of the total expenditure of USM. This problem beside the increase in the prices of health care and medicine are the main reasons for reforming the health care system in USM by introducing new sustainable resource for financing the health care system. In recent years, both allocation for health services and students' health care fees were not adequate in comparison with the yearly increasing demand of health care dues with the continuous increase in the number of university students and staff. USM staff, retirees or students, according to their terms of health service, when they become active patients, they can go either to the USM health centre, or to any other university panel of clinics. Services offered at the two choices are almost the same: consultation, laboratory investigation, and medications. But the cost of these services, which is paid for by the university, is greatly different; the average reimbursement claim per visit for the panel clinics is RM 14.00 (USM Report, 2003). Also there is a difference in the operational hours; the USM health centre is as follows: from 8.10 am to 12.45 pm, from 2.00 pm to 7.00 pm. Also there is a doctor on call 24 hours a day during non-operational hours and there is panel in the health centre from 5.00 pm to 8.00 pm. Health policy makers decided to introduce a new policy so as to make staff and students shift from excessive use of the university

panel of clinics to the USM health centre. The new policy aims to contain health costs, to deter unnecessary or marginal utilisation of panel clinics, help in allocation of health services, and promote rational use of services and drugs. But, all these polices aim to control the expenditures and utilisation by limiting the visits to panel of clinics, pharmacies or hospitals but these polices might shift these visits from the panel to the health centre.

The health system at USM performs a vital function. They minimise both health and financial risks and make a major contribution to social and economic welfare. In light of various cost pressures, the USM has articulated the challenge facing their members including staff, students and dependants as the need to secure the financial sustainability of their health system without undermining shared values: universal coverage, equity of access and the provision of good-quality health care.

This thesis aims to contribute to addressing this challenge by examining how strengthening the design of health care financing can help to secure health system sustainability. The thesis begins by clarifying the nature of the sustainability problem through analysing the current health care system. It then explores the impact of current financing arrangements and recent financing reforms with respect to their ability to secure sustainability.as well as modelling the cost of the different health care services provided to all USM's beneficiaries. Finally, it offers some practical suggestions regarding the best way forward by building a sustainable health care financing model. Thus, reforming the health care financing system by introducing both social health insurance for staff and students as well as cost sharing will lead to building a sustainable health care financing model and also control the unnecessary utilisation of health care either through the health centre or panels.

In summary, the aim of this thesis is to solve the problem statements as following:

- Problem 1: fiscal sustainability by cost and revenue analysis.
- Problem 2: examine the impacts of polices on expenditures and utilizations by modelling health care utilisation and cost and explore the trends of utilisations and expenditures among the policies and;
- Problem 3: sustainability of the new simulation health care financing model by application of different assumed scenarios.

1.4 Rationale of the study

There are various reasons why health care financing has become the focus of discussions around the world. USM is an example to start reforming the health care financing system which will provide both policy makers in this organisation or other similar organisations in Malaysia and the overall health care system in Malaysia with a preferred model for financing health care. The health care system at USM is needed to optimally finance health care with a sustainable model to protect both the system and people from financial risk in the future. In this study we will focus on building a social health insurance model for USM staff, students and their dependants. It has been recognised as one of the tools to enhance accessibility, achieve equity and social solidarity, improve efficiency and quality, unify and integrate both the public and private health sectors and to better regulate health care providers. Similarly for USM or Malaysia, the main objective is to improve accessibility and equity for a high quality, efficient, integrated and comprehensive coverage of health care services for the people, through a national health financing mechanism, which encourages cost sharing among stakeholders in health and optimises the government's contribution and commitment to improve the quality of life of the population. In practice, more than a single source of financing coexists in any one health care

system. Some of the examples are social or national health insurance, general taxation, private insurance, medical saving accounts and out-of-pocket payment by patients. There is no single perfect health care financing system as each source of financing has its own strengths and weaknesses. This research aims to investigate the following aspects:

- Trends of expenditures and revenues in the current health care financing;
- Impact of cost containments polices on the current health care financing system;
- Cost control – both on the demand and supply sides;
- Modelling the health services costs;
- Level and ceiling of contributions;
- Targeted subsidy by the Government for the disadvantaged groups;
- Co-payment and user fees – the acceptable level and the ceiling; specific for certain services or generalised;
- How does the source of financing create greater equity, accessibility and integration in health;
- The transition period from the current system to the new health care financing model and projection for 10 years.

More than two years ago, the Universiti Sains Malaysia adopted a strategy and specific purpose in the banner of guaranteed view (for a sustainable tomorrow). In addition, the university was selected in a government program to accelerate Excellence (APEX) without the rest of the Malaysian universities. Healthcare at the university for all of its members of staff with their families and their dependents and all of the students and their dependents is the focus of attention on restructuring; universal healthcare is able to protect its members by creating an ideal model that is able to provide sustainable healthcare within

the goal of establishing a financially sustainable health system. For these reasons, it is important to provide a comprehensive study, which will analyse the current healthcare system and provide knowledge of bias over the years, as well as to determine the effect of fiscal policies for health (fiscal policy is the use of government revenue collection (mainly taxes) and expenditure (spending) to influence the economy). The successive tendency of this system and the advantages and disadvantages of building a simulation model to build a financial system for the sustainable health of this organisation should also be investigated. This model will give clear results of the financial system and current health and will model the cost of healthcare while building a simulation model. For future sustainable health systems, a financial model would be applicable locally as part of the organisation or expanded to include regions or states.

In light of the above-mentioned discussion regarding the importance and significant role of developing a new health care financing system in the Malaysian and USM context, the present study will also help to provide USM with a new health care finance model, i.e. construction of a sustainable health care financing model for USM.

1.5 Study objectives

1.5.1 Aims of the study

The purpose of the study was to analyse the health care financing system of USM during the years from 2000 to 2009 including health care expenditures and revenues, health services utilisation and cost and modelling the health services costs, and hence to develop a sustainable health care financing model for USM

1.5.2 Specific objectives

1. To evaluate the USM's health care financing model (cost and revenues analysis, trends, policies impacts, and fiscal sustainability) for years 2000 to

2009.

2. To evaluate the USM's health care utilisation and expenditures pattern for years 2004 to 2009, studied the impacts of different policies and modelling health services in USM's health care system including health centre (USMHC) and a panel clinics (USMPC)

3. To develop and simulate a sustainable health care financing model at USM using the health insurance simulation model (SimIns) and forecasting for ten years from 2009 to 2019.

1.6 Significance of the study

This study extends the finding of evaluation of the current USM's health care system including cost analysis of expenditures and revenues, trends across years 10 years (2000-2009), modelling of the cost of health care services provided by USM health system, drug utilization, categorization of health services, evaluation of the utilization pattern, impacts of cost containment polices used at USM and development of a sustainable health care financing model under different assumptions.

The purpose of the study is to analyse the features of an efficient system of financing health care, and hence to build a sustainable model of financing health care for Universiti Sains Malaysia (USM), the second oldest public university in Malaysia. In this study, the objectives for an ideal model of financing health care are as follows:

- Consumers and providers can push and pull demand for health services. It is therefore crucial to the efficiency of a financing system that both users and providers

have an incentive to eliminate waste in the system, and thereby reduce the burden of cost to all.

- The system should be affordable for all.
- In other words, a financing system that prevents people from seeking treatment due to cost is seriously flawed.
- The value for money for the financier should be identified as an objective.
- The system should be sustainable.

The contributions of this thesis are:

1. It evaluates USM's health care financing system between 2000 to 2009 identifying its advantages and disadvantages;
2. It highlights the utilisation of healthcare by USM staff and students and their dependants in that period;
3. It provides policy makers with useful data including the trend of health expenditure, revenue and the sustainability of health care financing under the current system in that period;
4. It provides policy makers with useful data which estimates the cost/capita, cost/prescription, categorization of health services and the total cost of providing health services for USM staff and students and their dependants in that period;
5. It provides policy makers with useful data about the success of the expenditure policies on the total expenditures of providing health services for USM staff and students;
6. It developed a new sustainable health care financing model (social health insurance) for USM using SimIns;

7. It developed many scenarios for the health care financing system at USM using different assumptions and forecasting the new healthcare financing model for ten years from 2009 to 2019.
8. It provides the USM policy makers baseline information about the current health care financing model at USM from 2000-2009.
9. The findings of this thesis will serve as an efficient health care financing model for USM as an institution, which might be used as a baseline for any future health care financing model for other similar organisations, provinces or across the country.

1.7 Chapters summary

Overall, this thesis is a cross-sectional study consisting of seven chapters. Chapter one is an introduction. Chapter two is the literature review which discusses all relevant previous studies including the impact of expenditure policies and review for the healthcare financing models. In addition this chapter review the most relevant studies regarding sustainability and the theoretical and conceptual frameworks were included. Chapter three is the part one of this thesis which is an evaluation and cost analysis study evaluating the current healthcare financing model at USM. Chapter four is the part two of this thesis which examined the utilisation rate of staff, students, and their departments in the presence of different polices applied by USM. Part Three (chapter 5) of this thesis sought to build and develop a sustainable health care financing model. The simulation health insurance model (SimIns) developed by both GTZ and WHO was used. Many scenarios were developed to obtain sustainable models for staff and for students. Chapter six is the general conclusion of this thesis and includes the recommendations and limitations of this study. Finally, chapter seven is including all references of this thesis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The main topic of this chapter is reviewing the literature regarding health care financing models. However, three other topics presented briefly. The first one discusses how the cost containments policies and reforms influenced the utilizations and the cost. The second one is a brief introduction to health care financing models with special focus on health insurance and sustainability. Health insurance simulation model is relevant because it is the conceptual framework adopted in this thesis.

2.2 Background

Health is increasingly included as an important goal of national development. It can make development more sustainable (Berman, 1995). The data available on the financial aspects of health care was scattered. The key reason for the lack of availability of a centralised databank regarding primary health care is that primary health care is often paid for out of pocket, and there is therefore no formal financing structure. In addition, it found that financial analysis has been concentrated on secondary care. This is no doubt due to the level of expenditure on secondary care compared to primary care. Nevertheless, some research carried out is relevant to both primary care and secondary care.

A study produced by ESRI (The Economic and Social Research Institute, Dublin) produced in 1988 entitled "Financing the Health Care System: Private Financing an Alternative?" concludes, *"The health care area is inherently unsuitable for*

the application of the private insurance model." Two key problems are identified. Firstly, it is noted that there would be gaps in coverage for low-income groups and high-risk groups. Secondly, it is noted that a third party payer may be unable to control costs. A paper published by WONCA (World Organization of Family Doctor) and the WHO (World Health Organization) acknowledges that improving efficiency and financial structures has a beneficial effect on quality of care (Brennan Joyce et al., 2000).

National policymakers cite raising revenues as their main objective for introducing user fees. Subsidiary objectives stress that revenues are needed to improve services, for example, by improving drug availability and the general quality of health care and extending coverage (Gilson et al., 1995, Nolan and Turbat, 1995). Although never explicitly identified as an objective of user fees, the desire to raise revenue and improve services can presumably be related to a concern to enhance the sustainability of health systems. Financial sustainability can be defined simply as generating sufficient reliable resources to enable continued and improved provision of health care for a growing population. However, a broader definition, rooted in review of the role of external support to health systems, suggests that system sustainability is the capacity of the health system to function effectively over time with a minimum of external inputs (LaFond, 1995).

Achieving sustainability in this sense requires the capacities to

- Secure sufficient resources to enable improvements in the effectiveness of health care
- Use resources effectively and efficiently to meet health needs
- Perform these functions on a continuous basis
- Perform these functions with minimum external inputs.

In other words, generating revenues through some sort of financing mechanism is insufficient by itself to ensure sustainability. Additional measures to redress existing

inefficiencies in resource use and to enable any additional revenue to be used effectively over time are vital elements of a sustainable and effective user fee system (Adams and Harnett 1995; (Gilson, 1995). International analysts have also suggested that using revenues from user fees to improve the quality of services will generate efficiency and equity gains through their impact on utilization (Gertler et al., 1987, Griffin, 1992, Litvack and Bodart, 1993, Shaw and Griffin, 1995). However, while some countries have employed user charges to foster efficiency-related objectives, such as discouraging unnecessary use and preventing bypassing of lower level facilities, only one of the countries surveyed by (Nolan and Turbat, 1995) explicitly identified improving equity as an objective.

2.3 Health care reforms in Malaysia

The main goals of the Malaysian health system, and any possible reforms, would be to improve the health status of the population, to improve the responsiveness of health services to the population, and to improve the financial fairness of funding for the health system. In general, the available evidence demonstrates that the Malaysian health system achieves remarkably high and equitable health status at relatively low cost. Popular dissatisfaction and the persistence of an active private sector raise questions about the public health services' responsiveness. Since public services are currently provided at very low cost, the system is probably very "fair" in the sense that no one is excluded from receiving care on the basis of ability to pay. On the other hand, the perception that private care is better quality, or the greater convenience of private care, lead a large number of people to pay for services that they could otherwise get for free or at highly subsidized rates. Data compiled by the World Health Organization show that the overall performance of the Malaysian health care system is remarkably good. One indicator, the “Health Adjusted Life Expectancy” (HALE) at birth, is comparable to

that of industrialized countries-about 63 years. This accomplishment is remarkable, however, because Malaysia devotes only 3 percent of its GDP to health, compared to about 6 percent for most industrialized countries and 14 percent for one of them (the United States). The recommendations that emerged from this diagnosis were for the country to proceed with a limited reform. This reform should improve the management of public health services so that they can provide better working conditions for their staff, fill critical vacancies, enhance responsiveness to the population's needs and wants, and maintain an equitable basis for financing health services (Shepard et al., 2002).

According to Meyers, 20001, the Malaysian government began making efforts towards building a sustainable health system when exposed to the global financial crisis that hit Southeast Asia. Therefore, the economic and econometric analysis of the impact of economic crises on the demand for healthcare in Malaysia helped decision makers and managers to understand and visualise the appropriate solutions to this important sector as it maintains a stable and sustainable situation. For example, the financial crisis has made the Malaysian government face difficulties in the carrying capacity of the financial risks that have affected many service sectors, including the lowest level of health care. For this reason, the reform process is currently underway for the health sector and further work is also being planned. This is in spite of the changing economic situation and improvements, but aims to prevent the occurrence of such difficulties during the crisis. Plans to increase extra-budgetary funding for the health delivery system through the development of a funding mechanism like social insurance, medical savings accounts, etc. are being studied closely.

The impact of the financial crisis means that the government's budget is facing difficulty in financing the health sector, even in essential services. For this, the Ministry of Health and the Malaysian government are making efforts to restructure the sector and