ASSESSING EQUITY IN HEALTHCARE UTILISATION IN MALAYSIA

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THESIS SUBMITTED IN FULFILMENT
OF THE REQUIRMENT
FOR THE DOCTOR DEGREE OF PUBLIC HEALTH
(Dr PH)

FACULTI OF MEDICINE
UNIVERSITY OF MALAYA
KUALA LUMPUR
2016

UNIVERSITY OF MALAYA

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Name of Degree : **DOCTOR OF PUBLIC HEALTH (DRPH)**

Title of Paper/Project/Dissertation/Thesis ("this Work")

"ASSESSING EQUITY IN HEALTHCARE UTILISATION IN MALAYSIA"

Field study : **PUBLIC HEALTH (HEALTH ECONOMICS**)

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ABSTRACT

Malaysia has made a huge improvement in health over the past several decades, which is supported by continuous government investment in healthcare delivery network. However, the rapid development of Malaysia's economy since 1950, has witnessed great changes in demographic structure and the epidemiological pattern of diseases in its population. Moreover, since independence the increasing role of the private health sector has turned Malaysia's health system into a dichotomous health delivery system hence the overall country's health system landscape. This study was conducted to assess fairness in healthcare utilisation and its contribution towards universal health coverage in Malaysia. A study on fairness for the healthcare utilisation is driven by the concerns about the impact of welfare, especially among poor. This study covered two main components of healthcare utilisations which are the out-patient and in-patient care services. Assessing the fairness in healthcare utilisation for healthcare services is based on the notion that utilisation for healthcare services must be based on health needs and not been influenced by other factors such as socio-economic background or geographical location of residence. This study analysed the extent of fairness in healthcare utilisation using three sets of Household Health Survey data-National Health and Morbidity Survey (II), (III) and (IV) which allowed the evaluation to be conducted at three points in time, namely, 1996, 2006 and 2011. In addition to assessment of healthcare utilisation at the national levels, these data sets also allowed for sub-national assessment namely by strata, region, state and ownership of government and private facilities.

In general, this study revealed that the utilisation for both the out-patient and in-patient care services were equitable. Individuals in this country have been found to have an adequate access for both in-patient and out-patient care services. Secondly, the utilisation of both services were equally distributed across the income-gradient and the utilisation of both services after standardising for the health needs were equally distributed across the income-gradient, regardless of different places of residence, despite growth and increased role of private health sectors, over time. The public facilities were utilised mainly by the poor in rural areas and East Malaysia, meanwhile for private sectors, it is used by the rich particularly in urban areas and peninsular region of Malaysia. This study provides two main policy implications. The first is that equity in healthcare utilisation can be achieved by a system dominated by the public services, in which the provision of comprehensive services by the government will ensure that all segments of the population regardless of their socio-economic background and location of residence, receive adequate health services based on their health needs. The second implication is that the rapid growth of private health sector over time may not necessarily affects the equity status in healthcare utilisation, provided a comprehensively low priced public health services is available throughout the country, to ensure access for the disadvantaged population.

ABSTRAK

Malaysia telah membuat pencapaian yang besar dalam tahap kesihatan selama beberapa dekad, hasil pelaburan yang berterusan oleh pihak kerajaan dalam menyediakan rangkaian penjagaan kesihatan yang luas. Namun begitu, perkembangan pesat ekonomi Malaysia sejak 1950-an, telah menyaksikan perubahan ketara dalam kandungan demografi serta corak epidemiologi penduduk. Selain daripada itu, peranan sektor kesihatan swasta yang kian meningkat setelah kemerdekaan, turut merubah sistem kesihatan ke arah sistem dikotomi dan seterusnya landskap sistem kesihatan negara secara keseluruhannya. Oleh itu kajian ini dijalankan untuk menilai pencapaian keadilan dalam penggunaan penjagaan kesihatan serta sumbangan ke arah UHC di Malaysia. Kajian ini didorong oleh isu kebajikan, terutamanya di kalangan keluarga isi rumah miskin. Analisis ini meliputi kedua-dua bahagian penggunaan penjagaan kesihatan pesakit luar dan pesakit dalam. Penilaian keadilan terhadap penggunaan penjagaan kesihatan adalah berasaskan kepada tanggapan bahawa, penggunaan perkhidmatan penjagaan kesihatan setelah diselaraskan kepada keperluan kesihatan seharusnya tidak dipengaruhi oleh faktor-faktor seperti latar belakang sosioekonomi atau lokasi geografi. Kajian ini menganalisa tahap keadilan dalam penggunaan penjagaan kesihatan menggunakan tiga sumber data dari Tinjauan Kesihatan Kebangsaan dan Morbiditi (II), (III) dan (IV) yang membenarkan penilaian dijalankan pada tiga jangkamasa, iaitu pada tahun 1996, 2006 dan 2011. Selain penilaian penggunaan penjagaan kesihatan di peringkat kebangsaan, data ini juga membolehkan penilaian sub-nasional dilaksanakan mengikut strata, negeri serantau dan pemilikan fasiliti kerajaan dan swasta. Secara umumnya, kajian

ini menunjukkan bahawa penggunaan kedua-dua perkhidmatan, iaitu rawatan pesakit luar dan pesakit dalam adalah adil. Ini berdasarkan kepada beberapa penemuan iaitu individu di negara ini mempunyai akses yang mencukupi bagi kedua-dua perkhidmatan pesakit dalam dan pesakit luar.Penggunaan bagi kedua-dua perkhidmatan kesihatan ini adalah saksama di kalangan kumpulan pendapatan yang berbeza. Penggunaan perkhidmatan kesihatan tersebut juga apabila diselaraskan kepada keperluan kesihatan masing-masing tidak dipengaruhi oleh jurang pendapatan, perbezaan tempat tinggal serta pertumbuhan sektor kesihatan swasta. Kemudahan awam digunakan terutamanya oleh isi rumah golongan miskin di luar bandar dan Malaysia Timur, sementara itu bagi sektor swasta, ia digunakan oleh isi rumah yang kaya terutamanya di bandar dan Semenanjung Malaysia. Kajian ini membawa implikasi kepada dua dasar utama. Pertamanya, ekuiti dalam penggunaan penjagaan kesihatan boleh dicapai melalui satu sistem yang didominasi oleh perkhidmatan awam, di mana penyediaan perkhidmatan yang komprehensif oleh kerajaan akan memastikan semua segmen penduduk tanpa mengira latar belakang sosio-ekonomi dan lokasi tempat tinggal, mendapat perkhidmatan kesihatan berdasarkan keperluan kesihatan mereka. Implikasi kedua ialah pertumbuhan pesat sektor kesihatan swasta semestinya akan menjejaskan status ekuiti dalam penggunaan penjagaan kesihatan, dengan syarat pencakupan perkhidmatan kesihatan awam yang berharga rendah mesti telah terdahulu disediakan di seluruh negara, bagi memastikan penduduk yang kurang bernasib baik mendapat akses perkhidmatan kesihatan yang sepatutnya.

ACKNOWLEDGEMENTS

I would like to express my most sincere and greatest gratitude to both of my supervisors, Associate Professor Dr. Ng Chiu Wan and Professor Dr. Maznah Dahlui for their support and guidance in the preparation and finalisation of this thesis. It is their continuous encouragement that motivated and inspired me to complete this thesis regardless of all the difficulties that were encountered throughout the journey. I need to say that it was a priceless experience as this was a challenging "heart and mind" journey from which I gained valuable knowledge and learned to appreciate the true meaning of perseverance and optimism.

I would also like to acknowledge Professor Dr. Ruby Husain who always has been my mentor. The individual who always made me believe that I am capable to strive for the best and never to give up. I am also indebted to my superior in Institute for Health System Research (IHSR) particularly the Director, Dr. Roslinah Ali and the Head of Health Economic Division Dr. Ramli Bin Zainal and to all my colleagues for their support and for allowing me to work on this thesis despite the growing volume of work at the institute.

Last but not least my very special tribute and gratefulness to my family members because without their support, none of this will have been possible. To both of my parents and parents in law, both of my sons who have seemed to grow up with less attention from their "grumpy" father and ultimately to my loving wife for who patiently believed in me and love me.

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LIST OF ABBREVIATIONS

ABC	Alternative Birthing Centre
AI	Atkinson Index
ATP	Ability to Pay
BMI	Body mass Index
CAD	Coronary Artery Disease
CC	Concentration Curve
CI	Confidence Interval
C	Concentration Index
DEPS	Distribution Effect of Public Spending Survey
EBs	Enumeration Blocks
FOMEMA	Foreign Medical Examination Malaysia
GDP	Gross Domestic Product
GNHE	Global Network for Health Equity
ICU	Intensive Care Unit
IMR	Infant Mortality Rate
HFA	Health for All
HI_{wv}	Horizontal Inequity Index
KKM	Kementerian Kesihatan Malaysia
Km	Kilometres
Kg	Kilogram
LQs	Living Quarters
m	meters
MAC	Missing at Cluster

MAR	Missing at Random
MAMI	Malaysian Adult Multimorbidity Index
MMR	Maternal Mortality Ratio
MNHA	Malaysian National Health Accounts
MOH	Ministry of Health
NCDs	Non-communicable disease
NHMS	National Health and Morbidity Survey
NEP	New Economic Policy
NHP	National Health Policy
OECD	Organisation for Economic Co-operation and Development
OOP	Out-of-Pocket
PAHO	Pan American Health Organisation
PAR	Population attribution at Risk
PCA	Principle Component Analysis
PIH	Permanent Income Hypothesis
PHC	Primary Healthcare
RII	Relative Index of Inequality
SES	Socioeconomic Status
SHI	Social Health Insurance
SRH	Self-rated Health
UHC	Universal Health Coverage
USD	The United States Dollar
WHO	World Health Organisation
WTTC	World Travel & Tourism Centre

CHAPTER 1: INTRODUCTION

1.1 Introduction

*".....All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood……The Universal Declaration of Human Right**…....…**"(Richard, 2008)*

Health is a fundamental human right and healthcare has been recognised as an important determinant for health (Papadimos, 2007). Since the mid-20th century, most countries had pledged to improve the provision of healthcare and embrace the "Health for All" (HFA) concept which was adopted during Alma-Ata Declaration in 1978. The HFA concept became a prominent movement to improve the population's health and protect the human rights (Tarantola, 2007). It was aims to achieve the highest attainable health for every individual. After several decades, HFA concept has evolved into universal health coverage (UHC). In addition to achieving the health goals, HFA concept has expanded to protect the population, especially the disadvantaged (PAHO & World Health Organisation, 2014; World Health Organisation, 2010b)

In line with the Alma Ata Declaration, the movement for UHC is still fundamentally rooted towards respecting health as a human right. It requires strong political leadership and commitment to produce a well-coordinated healthcare financing and delivery component within a robust healthcare

system (PAHO & World Health Organisation, 2014). UHC consists of two important components namely providing access to quality health services needed for good health and to protect the individual from incurring financial hardship when making payment to use them (Dye C. et al., 2013). The goal of UHC goal is about respecting everyone's right to health and it matches with the equity concept in healthcare. In fact, if UHC is not immediately attainable, at least making progress towards equitable healthcare is the critical path to achieve UHC (Dye C. et al., 2013; Ottersen, 2014).

Equity in healthcare delivery is a concept of distributive justice and target to provide equal access for the individual to utilise the care when it is required. It is to create an equal opportunity for every individual to be healthy thus enabling him to explore life opportunities equally (Daniels, 1981). Equity in healthcare utilisation is not only focussed on equal distribution of healthcare infrastructure, but more important is to have equal opportunities to utilise the services without any barriers (Amartya, 2002). However, it is impossible to allow the entire population to utilise the healthcare services equally due to scarcity in healthcare resources. Hence, the ethically approved inequality for utilisation in healthcare is based on health needs or the capacity to benefit from healthcare to protect the individual's life opportunity. The health of an individual may be affected by diseases, injury or disability. Utilisation for healthcare therefore should be made accordingly, to correct the disadvantages or misdevelopment of the individual's capability, deprived by the burden of illness.

1.2 Study Motivation

"....I regard universal health coverage as the single most powerful concept that public health has to offer. It is inclusive. It unifies services and delivers them in a comprehensive and integrated way, based on primary healthcare..."

Dr Margaret Chan *(Holmes, 2012)*

The statement by the WHO Director-General, Dr Margaret Chan has reaffirmed the direction for global healthcare system. UHC entails a well-managed and well-coordinated healthcare delivery and financing system. Any health system that claimed to have achieved UHC should be able to provide the individual or families who need the care, good medical services supported by recent technologies and delivered by dedicated well-trained health personnel. It should also be able to protect all individuals and families from financial burden when making the payment to use the healthcare services (Campbell J. et al., 2013; Ottersen, 2014).

In this context, Malaysia professes to have achieved UHC (Chua, 2012; Rockefeller Foundation, 2011). The Malaysian health system has a long history. It is inherited from a system established since the colonial period. Over the years it has gradually expanded into a universally accessible system. The Malaysian health system consists both public and private healthcare providers. The government provides the healthcare services to the nation through public facilities and the services range from preventive, curative, promotive to rehabilitative care. The main public health provider is the Ministry of Health (MOH). General out-patient services and in-patient care

services are easily accessible to the public. However, access to specialist care services is controlled through the national referral system. Specialist care services are available in the major hospitals and certain district hospitals. Referral to specialist services is made to the nearest available public health facility.

Public health services are heavily subsidised by the government through financial resources obtained from general taxation. Meanwhile, the private healthcare providers are supported by Out-of Pocket (OOP) payment by individual patients, employers' contribution or from the private health insurance reimbursement (Chai, 2008; Leng, 2007). The private healthcare services in general complement the medical services provided by the government and mainly focus on curative services. The payment for public healthcare services in Malaysia has always been maintained at very low cost. (Meerman, 1979) concludes that the Malaysian government had successfully provided medical care for all, at zero or near zero cost to the users regardless of the individual's income. There is also evidence to show that the assessment for Malaysia's healthcare finance in 1990's was found to be progressive and considered as equitable (Chai, 2008). In other instances, Assessing Fairness Financing of Healthcare in Malaysia by Ng (2012) also supported this finding. In addition to that, the Malaysian population especially the poor were protected from catastrophic payments when using the healthcare services. The level of catastrophic payment was less than two per cent of population who incurred OOP payment exceeding ten per cent of total household consumption yearly and were concentrated among the rich (Ng, 2012).

The financial component of Malaysia's health system in general coincides with the concept of the UHC. However, there is still a gap of knowledge with regard to whether utilisation of healthcare in Malaysia conforms to the same principles especially since the pattern of utilisation for the healthcare services in Malaysia has changed drastically over time (Ministry of Health, 2013b). The enormous economic development, epidemiological transition and major socio-demographic shift after the country's independence from British rule in 1957, saw a major impact to the healthcare demand. The well-informed public with increasing affluence choose to use the private healthcare services that are often perceived to deliver better healthcare services compared to public services. This directly has enhanced the growth of the private sector which has become an important contributor to the country's economy. Moreover, most of the private healthcare facilities are located in Peninsular Malaysia and concentrated in the urban areas. This has been due to the fact that higher demand for private healthcare arises in these places, triggered by the utilisation of its services by the affluent members of the population who are mostly urban dwellers.

The poorly coordinated growth and maldistribution of the private healthcare facilities between the Peninsular and East Malaysia (Sabah and Sarawak), as well as between urban and rural areas have given rise to equity concern especially on how individuals of different incomes and residing in different geographical areas, actually utilise public and private healthcare services. The issue on equity/fairness for healthcare utilisation is even more relevant during

the period before and after the major Asian economic crisis that affected the Malaysian economy in 1997. This was based on the argument that this economic event could have left major consequences on the individual's selection for the private or public healthcare services. Hence, it is important to assess the achievement from the perspective of fairness in healthcare utilisation, to know if UHC has actually been achieved in Malaysia, especially when the financial component for the Malaysian health system has persistently demonstrated to be equitable.

1.3 Study Objective

Major economic development and changes in the disease pattern in Malaysia for many years, has altered the population's behaviour towards healthcare. The Malaysian health system that was once dominated by the public healthcare provider became more balanced with the participation of private healthcare. In general, this factor had influenced the distribution of healthcare utilisation between the private and public sector, especially when the growing number in the population started to perceive that better healthcare services were delivered by private healthcare providers rather than public. The primary objective of this study therefore is to assess whether all of these changes have influenced the fairness/equity in the distribution of healthcare utilisation in Malaysia.

Since a fairly utilisation of the healthcare services is tied to the notion that the healthcare utilisation must be according to health needs, this thesis therefore aims to assess to what extent has these utilisation made by the Malaysian population of different socioeconomic backgrounds and residing in different geographical region, adhere to that principle. Specific characteristics for fair utilisation will be assessed at three specific points in time, spanning over 15 years (1996, 2006 and 2011) which was a significant period for private health sector development and major economic event that hit the Malaysia's economy in 1997.

The specific objectives of this study;

i. To establish an appropriate theoretical framework to assess equity in healthcare utilisation and its contribution to UHC

ii. To identify changes in the Malaysian healthcare system that may have impacted on equity in healthcare utilisation and subsequently UHC

iii. To assess the quality and compatibility of three household health survey data sets to ensure consistent estimates of changes in equity in healthcare utilisation over the period of study (1996,2006 and 2011)

iv. To develop an appropriate measure of healthcare need using available data in the household health surveys

v. To evaluate equity in the utilisation of out-patient care services in Malaysia at three selected points in time namely 1996, 2006 and 2011

vi. To evaluate equity in the utilisation care of in-patient services in Malaysia at three selected points in time namely 1996, 2006 and 2011

vii. To assess whether utilisation of healthcare services had been equitably distributed for the period from 1996 to 2011 and its impact on the achievement of UHC in Malaysia

1.4 Study Contribution

There are two main contributions obtained from this study. First is the additional information with regard to the achievement of UHC in Malaysia. Evidence has persistently shown that individuals in Malaysia are not burdened when making payments to use the healthcare services, but the extent of equity in health care utilisation is still not fully understood. Understanding the pattern of healthcare utilisation is necessary to draw comprehensive conclusions concerning the status of UHC in Malaysia. Furthermore, the major economic growth over the years has changed the population's behavior towards healthcare. The private healthcare providers have become more significant in terms of economic contribution, due to the fact that a greater proportion of the population could afford to pay for the private healthcare services that are perceived to deliver better care than the public services.

This study had assessed the equity status pertaining to healthcare utilisation for people who need the care in relation to their living standard, in different geographical areas in Malaysia. All these evidences will be beneficial to monitor the UHC achievement and sustainability. The information acquired from this study had provided valuable evidence for informed discussion for future healthcare reform in Malaysia. In tandem with the work of WHO, many countries have strengthened their work in progressing towards UHC. Therefore, issues on fairness and equity addressed in this study are pertinent for the government entrusted to deliver and manage the healthcare services towards achieving UHC in particular for policy makers and technical advisors of MOH, Malaysia.

Secondly, research in the area of multiple health conditions is relatively limited in comparison to specific diseases. Therefore, assessing equity in healthcare utilisation had given the opportunity to assess the individual health status in the context of multimorbidity. Assessing morbidity using several health measures together in the form of a composite index has never been done before in Malaysia. This is important especially when the prevalence of non-communicable diseases such as hypertension, diabetes, chronic lung diseases and injuries are increasing and becoming more prevalent than the communicable diseases. Moreover, the occurrence of more than one chronic condition in the individual is becoming rampant among the population. Many researchers point to the evidence that individuals with multimorbidity experience poorer functional status, lower quality of life, poor health outcome, spend more money on their health and use a greater range of other healthcare services (Cynthia, 2010; Wijlhuizen G.J. et al., 2012).

All these factors influence the pattern of healthcare utilisation in the country and will demand for more effective plan for treatment. The multimorbidity measure constructed was used to assess the distribution of the morbidity among the Malaysian adult population across the demographic, socioeconomic and geographical locations. This morbidity measurement was then used to generate new information with regards to healthcare utilisation pattern which is needed for the assessment of equity analysis in healthcare utilisation.

1.5 Thesis layout

This thesis comprises **EIGHT** main chapters.

CHAPTER ONE: Provides a brief introductory statement, rationale and motivation of the study; reasons why this study was conducted, the underlying objectives and its potential contribution to Malaysia in general and body of knowledge for equity analysis.

CHAPTER TWO: Describes and discusses the philosophy, theories and concept of UHC and equity in healthcare and how it is related to justice principles, need concept, and utilisation. It also describes the established concept of equity measurement.

CHAPTER THREE: Describes and discusses the background and development of the Malaysia's healthcare system background, development and pattern of healthcare utilisation.

CHAPTER FOUR: Describes the quality of data and compatibility of three household health survey data sets to ensure consistent estimates of changes in equity in healthcare utilisation over the period of study

CHAPTER FIVE: Describes and explains the development of appropriate measures of healthcare status using available data in the household health survey

CHAPTER SIX: Contains the analysis of equity in the utilisation of out-patient care services in Malaysia at three selected points in time, that is 1996, 2006 and 2011

CHAPTER SEVEN: Contains the analysis of equity in the utilisation of in-patient care services in Malaysia at three selected points in time namely 1996 2006 and 2011

CHAPTER EIGHT: Contains the overall assessment of equity in utilisation of healthcare services over the 15 years period from 1996 to 2011 and consequently the impact on the achievement of UHC in Malaysia, and policy implications to further improve the country's healthcare system

1.6 Summary

In summary, achieving UHC is the ultimate goal for many health systems in the world and Malaysia is certainly not excluded. Although sufficient information shows that poorer Malaysians are not unduly burdened when making payment to utilise the healthcare services, however the overall picture on UHC in Malaysia is still unclear until the utilisation component of the healthcare services, especially from the perspective of fairness has been assessed. Since independence in 1957, major economic development and progress has changed the health system landscape, particularly on the role of private sector and the disease type and burden. Private provision of healthcare which in the early years was confined to primary care services, had started to expand to secondary care, driven by several events and demand by the affluent members of the society. At the same time, the disease pattern and epidemiology in the country had also changed over time. The prevalence of non-communicable diseases had increased and became more significant than the communicable diseases. The combination of both factors has influenced the pattern for the healthcare utilisation, particularly from the perspective of equity. This study therefore, had assessed the extent of equity/fairness in the distribution of healthcare utilisation and eventually it's contribution towards the UHC achievement in Malaysian healthcare system over 15-year period from 1996 to 2011. Data from three national health surveys were utilised for the analyses.

CHAPTER 2: FAIRNESS IN THE HEALTHCARE - PHILOSOPHY, THEORIES AND CONCEPT

2.1 Introduction

Although it is understood that how healthy people are and how long they will live is not merely a consequence of good medical care or availability of healthcare services, nevertheless, access to and use of needed healthcare can contribute to maintenance and improvement of an individual's health status. It has been found that people's socioeconomic backgrounds, where they live and whether they have a decent employment have influenced their access to the healthcare services they need. In this respect, for a fair health system, the government is obliged to play its role to ensure that every individual who need care should be able to access needed healthcare services regardless of their socioeconomic backgrounds. The health system in general comprises all the resources, manpower and institutions related to the funding and delivery of healthcare activities whose main purpose is to improve and maintain health. A fair health system therefore should, as far as possible, maintain a fair distribution of health (World Health Organisation, 2000) and this can be achieved if the health system is able to function in such manner that lead to fair financing and delivery of the services.

This chapter begins with the discussion of the concept of UHC in section 2.2, followed by the standard for justice as fairness in section 2.3. Sections 2.4 discuss the concept of distributive justice with regard to healthcare and section 2.5 highlight the understanding for fairness in the delivery of healthcare

particularly for utilisation of care. Subsequently section 2.6 will discuss on the concept of health need and this chapter concludes with section 2.7 which summarises the arguments in support of the role of fair utilisation for the healthcare services to ultimately achieve fairness in health.

2.2 Universal Health Coverage

Individuals today are living longer but many may not enjoy good level of health status throughout their life spans. Part of this is shown by the increasing demand of healthcare over time in Malaysia (Ministry of Health, 2013b). In addition, issues concerning inequalities in health have become more prominent and are now a matter of concern of many health systems worldwide. In this respect the responsibilities of the health system has begun to expand beyond fulfilling its health-related goal which is to enhance the population's health status. It also has to protect the population especially the disadvantaged ones. The health system has widely been recognised as a social component of health and has become an important tool to improve the population's health (United Nations High Commissioner for Human Rights & World Health Organisation, 2008). It is has been acknowledged as able to relieve the undesirable health effect associated with social stratification, caused by economic discrimination by society.

To relieve the undesirable health effect is to protect the welfare of the disadvantaged individuals. The welfare of the disadvantaged population is protected whenever the barriers to utilise the healthcare are removed and pay for according to the individual's affordability. To undertake this duty, the

financing and delivery component of a health system must be carefully designed. The financial component the system must therefore be able to function based upon the moral principle that assure the well-off populations help to subsidise the poor, which ultimately will provide the financial risk protection for all. For the delivery component, it should be provided to the whole population based on the need for care, regardless of demographic, socioeconomic or geographical location. In essence the goal is to establish to a system which provides UHC.

UHC which is the expanded concept of "Health for All", is defined as the condition where the whole population receive the quality health services they need and are protected from financial hardship in paying for the services (Ottersen, 2014). UHC that was endorsed by World Health Assembly in 2005, targets to align the financing component of the health system and promote an efficient delivery of high quality of healthcare (Tangcharoensathien et al., 2013). The global health system was urged to adopt the UHC concept as a remedial mechanism to adapt towards the new global health needs, in view of the disease transition and aging population (Garrett, 2013). The significance of this problem is demonstrated by the high proportion of the world's 1.4 billion poor who still do not receive the health services they need and the critical shortage of healthcare workers that have compromised the quality of care (World Health Organisation, 2013b). On top of that, about 44 million people suffer severe financial hardship and another 25 million were driven into

poverty every year because of medical expenses (Jamison, 1993).[1] The obstacles to achieve UHC in low-income countries are often caused by financial constraints (Garrett L. et al., 2009).[2]

The delivery components within the context of UHC have been clearly outlined. The UHC concept prescribe to the goal that quality healthcare must be equally provided to all segments of the population. This basically implies that access for healthcare should not be hindered by any geographical barrier, financial reasons or socioeconomic status. Therefore, the healthcare services must be made available and accessible to all the population. It must be able to deliver services that meet the population's health needs, by providing sufficient essential medications and health products, adequate number of motivated and well distributed health workforce with a balanced combination and supported by the information system that provide timely information for decision making (World Health Organisation, 2013b). A well-functioning health system responds in a balanced way to a population's needs and

[1] The people living in low and middle income countries obtained health services through out-of-pocket (OOP) payment and such costs have accounted for 19% of total global healthcare expenditure. Countries like Vietnam, Bangladesh, Pakistan and Ghana in fact, paid almost 50 per cent through OOP of their total health expenditure. High OOP expenditure restricts long time economic survival and leads to poverty and impoverishment. Garrette L. et al. (2009) All for Universal Health Coverage. *Lancet 374* (9697):1294-99

[2] An average per capita expenditure for low-income countries on healthcare is about USD 25 and can be as low as USD 4 (Ethiopia), below what is recommended by WHO which is USD 34 minimum per capita per annum. However, achieving the universal healthcare coverage is not directly linked to a country's GDP alone (Laurie Garrett et al., 2009).

expectations by improving the health status of individuals, families and communities.

This can only be achieved if the system is able to defend the population against what threatens their health and at the same time protect the financial consequences of ill-health. The health system is not capable to spontaneously provide balanced responses to these challenges nor do they make the most efficient use of their resources in the absence of effective policies or strong leadership. This is because keeping the health system on track requires a strong sense of direction and coherent investment in the six building blocks of the health system namely the leadership and governance, health information system, health financing, human resource for health, essential medical product and technologies and service delivery (World Health Organisation, 2010a).

The movement to achieve UHC is progressive in manner. It is about making progress on three important dimensions namely expanding priority services, including more coverage of people for healthcare and reduction of OOP. However, given the fact that healthcare resources are always limited, making fair choices for these three dimensions is always a challenge. Critical choices and fair trade-offs between the dimensions always need to be done and this is when the value of fairness and equity are used to guide the decision (Ottersen, 2014). Selecting on which services need to be expanded involved deliberating on important criteria such as cost-effectiveness, priority to the worst-off and offer for financial risk protection.

The specification, balancing and use of this criterion is recommended to be made collectively by wide range of group of experts to obtain the best decision and promote accountability for any decision made. A similar process is used when seeking to include more people coverage. Countries should initially target to expand coverage for low-income group, rural populations or vulnerable groups in order to achieve the ultimate objective of providing coverage to the entire population. Many middle-income and low-income countries rely heavily on out of pocket payment to finance healthcare services and such payment represents a barrier to access health services especially for the poor. Therefore, to improve access for healthcare is to remove this financial barrier by shifting from OOP payment to prepayment with pooling of fund.

In short, there is no single best way and specific time frame to achieve UHC but there are principles that can be used as a guide to achieve UHC (World Health Organisation, 2013b). United Kingdom took nearly five decades of hard work. Korea did it faster; only two decades to do so. However, if UHC cannot be attained immediately, at least making the progress towards a fairly and equitably system should be the main concern by any health system (Ottersen, 2014). Attaining affordable UHC with excellent health outcome requires the highest level of political commitment and a successful heath financing mechanism. No country in the world generally achieves UHC by chance because to accomplish UHC is a result of incremental achievement over a certain period of time. UHC is more than just to maintain or promote the population's health. It is a concept that subscribe to the principle to protect

every individual's right, especially the disadvantaged individuals. Therefore, the concept of UHC is very much connected to the value of justice that will be discussed in the following section.

2.3 Justice as fairness

Justice is about "moral rightness". It is grounded on ethics, consistency, fairness, natural law, religion and cultural values. The justice principles are often discussed under four important standards, namely, distributive, modulated, commutative and retributive justice (George P. Smith, 2009). The comprehension of the standard of justice can sometimes be reclassified into the distributive and non-distributive standard. The commutative standard of justice in general emphasise on a matter related to the responsibility between different parties or individuals, while for retributive justice, it is concerned with matters pertaining to restore or compensate those suffering injustice under the commutative, distributive or general justice. The modulated justice however, is to preserve the balance in the three other standards of justice.

In principle, distributive justice connects the characteristics of a person with morally justifiable welfares or burden. It is about fairness with regards to what people receive and can be either material or non-material form. The term distributive justice arises in conditions of scarcity or competition to obtain goods or even to avoid burden (Ton, 2001). It is not a new concept but it actually has appeared in history since early human civilisation. Aristotle described distributive justice as "equal must be treated equally and unequal must be treated unequally", however this formal principle of justice did not

explicitly define the meaning of equality or which differences are relevant in comparing individuals or groups.

Discussion and argument for the practical principle of distributive justice has evolved over so many years and it has recently been proposed to lean on six main principles, namely, according to need, according to effort, according to contribution, according to merit, according to free-market exchanges or equal in share (Ton, 2001). The six principles arise from the influence of utilitarian, libertarian, communitarian and egalitarian theories, have been used to formulate many public policies and there are no specifics rules preventing more than one of these principles to be used concurrently, depending on different scopes and situations (Ton, 2001).

2.4 Concept of distributive justice in healthcare

The thoughts about distributive justice has long been discussed in history, but the explicit operational concept of distributive justice in healthcare is still relatively new (George P. Smith, 2009). The operational concept of distributive justice basically appeared in Western thought and political discussions during the era of the Industrial Revolution (John, 2010). The concept of distributive justice that arose from expression of protest against exploitation towards labour eventually grew and became the focal point to improve the human condition at that time. By the mid-twentieth century, the concept of distributive justice had become crucial to ideologies and programmes of nearly all the political parties around the world (Baudot, 2006). Principle of distributive justice always revolve around three important

questions which are: What goods are to be distributed, to whom should they be distributed to and how are they being distributed (George P. Smith, 2009).

To substantially construct the argument with regard to the distributive justice in healthcare, it is a prerequisite for the distributive justice concept to be connected with the individual properties in a given society. There are many theories of justice but the most influential one is that of Rawls's "Justice as fairness"(Rawls, 1957). A just distribution according to Rawls' perspective was constructed on the notion of equal distribution of basic liberties or what he named as "primary social goods". According to him, the distribution of the primary good must be distributed equally as to promote fair equality of opportunities, especially those opportunities for advancement in society. It should be made available for all. John Rawls also stated that unequal distribution must also be permitted whenever the unequal distribution of the primary good ultimately benefits the disadvantaged individual in the society.

However, Rawls' ideas on the primary goods have intentionally excluded health, owing to the argument that people were healthy throughout their life path. Nevertheless, the fundamental idea on justice by Rawls has widely been accepted and expanded by many. Among them is Norman Daniels (2008), who developed one of the most comprehensive theories of justice for health and healthcare based on Rawls' theory of justice. The basic liberties has been tied with the protecting of life opportunity by Daniels, thus expanding the principle of justice in Rawls's theory in healthcare settings (Daniels, 1981). The argument is that healthcare is needed to maintain or restore the normal

functioning and consequently it is required to safeguard a person's opportunity in life, which is one of Rawls primary socials good.

Distribution of healthcare in general is always concerned with two important components; the financial contributions by the individual to utilise the services and the utilisation of the health services made available to the population. The basic concept of fair healthcare distribution is still that of Aristotle. The concept is based on two important formal properties of equality which are "treat equal, as equal" and "treat the unequal, as unequal". This equality concept by Aristotle when translated from the economic perspective, is called as the horizontal and vertical concept of distributive justice (van Der Hoog, 2010). The horizontal concept for fair distribution in healthcare is frequently used to assess the healthcare delivery which is reflected by the uptake or utilisation of the services or the utilisation. The utilisation for healthcare services under horizontal concept entail a similar utilisation to be made according to similar health requirement (Culyer, 1993). On the other hand, the vertical concept for fair distribution in healthcare frequently used to assess fairness in healthcare payment (Culyer, 1993). This concept is based on the argument that societies are made of diverse socioeconomic characteristics namely differences in affordability. Therefore, the payment or contribution for healthcare should be made accordingly, based on this dissimilarity.

2.5 Fairness in the delivery of healthcare

A health system which is believed to have achieved fairness in the delivery of care is one that ensure fair distribution of utilisation of healthcare services based on health need. Although reasons which led an individual to utilise the healthcare services are derived from the complex interaction between multiple factors, ranging from health services availability, demographic, socioeconomic, morbidity profiles to psychological factors, but from the point of equity the only factor that should be considered in fair distributions of healthcare services is the individual's health need.

2.5.1 Utilisation of healthcare

Evaluating the fairness in healthcare utilisation should begin by understanding the factors that potentially form as the barriers for individuals in need of healthcare to obtain the care. Healthcare utilisation is defined as the final result of the interaction between health professional and the patient (Alen Dever, 1984) and in economic terms healthcare utilisation corresponds to the production of healthcare services. Therefore, healthcare utilisation is a measure of the population's use of the healthcare services available to them. The information on healthcare utilisation is important as it is frequently being used to reflect the performance of healthcare delivery from several aspects namely, accessibility, productivity and equity. The two important models that are frequently used to understand factors for healthcare utilisation are; Anderson Behavioural and Access to Medical care Model and Grossman Human Capital Health Model.

Both of these models have outlined a number of possible factors that influence the utilisation of healthcare services. However, the final access to healthcare is related to supply issue which is the level of availability of services to individuals (Peter C. Smith et al., 2010). Ensuring access to care therefore demand that there are adequate numbers of healthcare resources and that those resources must first be distributed in a way in which people can gain easy physical access to them. However, physical availability per se is not enough to guarantee access to care. Access to healthcare also has to be considered from the perspective of financial affordability to care. Staying in close physical vicinity to any healthcare facilities does not automatically mean that an individual has access to healthcare services offered there if the individual does not have the financial means to pay for such services.

2.5.2 Fairness in utilisation of healthcare services

Fair utilisation of healthcare is concerned with two important values. The first is distribution of utilisation for healthcare which must be shown to be disconnected from or not be influenced by an individual's wealth or affordability and secondly the distribution of utilisation for healthcare must be made in accordance with one's particular distributive justice component (Section 2.3 & 2.4) which is the health need of the individual.

Thus, fairness in utilisation must firstly be assessed by examining the access for the healthcare services across different socioeconomic and geographical distribution. This is to illustrate that access for healthcare is universal, covering all socioeconomic groups as well as geographical distribution.

Numbers of utilisation serve as a proxy to access based on the fact that utilisation is the final result of the interaction between the supply and demand factors. A sufficient level of healthcare utilisation is not easily determined. This is basically due to the fact that optimal or sufficient level of utilisation for healthcare services for any given population depends on the arrangement of country's health system and the underlying health need of the population. It is determined by many factors ranging from demographic, morbidity and mortality pattern.

Variation with regards to the pattern of healthcare utilisation is not uncommon, even among developed countries, which are said to have minimal barriers to healthcare access, comparable health outcome and high rates of medical intervention. For instance, in Australia, the rate of consultations with physician was reported to be at 6.5 visits per capita per annum, while in Japan the average numbers of visits were noted at 13.2 visits per capita per annum. For in-patient care, Japan reported having utilisation rate at 107 per 100 capita per annum whilst for France, it was at 263 per 100 percapita per annum (OECD, 2011). Although there is no specific number established as an acceptable indicator to define the adequate level of healthcare utilisation, but overall assessment in OECD counties suggested that a minimum acceptable level of utilisation can be defined by a threshold of 4 out-patient care visits per capita per annum and 100 discharges per 1000 capita per annum for the in-patient care.

Secondly, it is important to assess the pattern of this utilisation across different levels of the living standard. Preferably the utilisation pattern is to be concentrated among the less advantaged group compared to the better off population, as lower health status or more health needs are usually reported among those of lower living standard.

Thirdly, fairness in utilisation for the healthcare services should be assessed by examining the nature of association of healthcare utilisation after standardising for health needs of individuals with different level of living standard. Ideally, there should not be any differences of healthcare utilisation that has been standardised for the health needs, among individual with different living standards, if the utilisation for healthcare is fair.

2.6 Understanding the health need

Fairness in delivery of healthcare involves evaluating the healthcare utilisation based on individual's health need for the care. The complexity therefore lies in deciding when healthcare is actually needed. Defining the health need essentially depends from whose perspective is the health need being perceived (Daniels, 2008; Jordan, 1997; Sagric, 2007). The economist expressed health need as a burden of disease and measured in terms of years of quality life lost. Meanwhile from the health professional's perspective, health need is frequently connected to morbidity and mortality.

Sociologists like Bradshaw classified health need into three different groups which are the normative need, felt need and express need. The normative need

is usually determined by the healthcare professional and it can be seen as a preventive type of need such as the need for immunization and maternal health to maintain the individual's health or to prevent someone from getting sick. Felt need is defined as what is desired by the person and usually depend on the signs and symptoms of illness. Lastly the expressed need is seen when it is translated into action or demand. Bradshaw's concept of need has been broadly used in health services research. However, this need concept is poorly associated with economic plausibility (Asadi-Lari, 2003). Baldwin described health need as a state of compensation resulting from the dis-equilibrium or imbalance. He suggested that health need is actually a gap that occurs between the actual and desired health status. For example, someone with coronary artery disease (CAD) need coronary artery bypass to obtain better quality and longevity of life. This concept of need has also been widely used in healthcare settings to help improve the healthcare services nowadays (Asadi-Lari, 2003). Pragmatists' such as Green and Kreutzer view the health need as the entire element that is required to maintain comfort and health of a person. Those entire elements cover all aspects of individual, social and environment conditions (Asadi-Lari, 2003).

In short, health needs can be appreciated from several perspectives and it has frequently been based on the argument that an ill individual basically has a justified need for healthcare. The amount and types of care required by any ill individual must perhaps be determined by the individual's types and degree of illness. Nevertheless, not every ill individual ultimately will benefit from care, especially if the technology to treat the disease/illness, experienced by the

individual does not exist. Furthermore, healthy people can also utilise the care to maintain their health status or to prevent illness. Hence, the presence or absence of illness in general, is not enough to denote the total concept of health need.

Based on that argument the discussion on health need has therefore been directed to encompass a broader perspective. Culyer and Wagstaff (1993) have argued that health need is actually the individual's ability to benefit from healthcare in order to achieve the goal of health improvement. This notion seems to correspond with Daniels' appreciation of health need, where he stated that a person receiving healthcare must fundamentally be able to benefit from care in order to achieve the normal human function (Danials, 2008). Therefore, holding to that understanding, the individual's ability to benefit from the health as a concept of health needs care must be accepted from a broader perspective. The health need in that manner is only best described whenever it includes all types of care namely preventive, curative and rehabilitative components. This is because healthcare is not only required to restore ill health but essentially to maintain, to enhance, and to protect the individual's health.

2.7 Summary

Good health outcomes are not just the consequence from good healthcare services. However owing to the argument that healthcare is an essential determinant for health, justifies the importance of why healthcare need to be managed judiciously. Fairness in healthcare is a concept of distributive justice. Healthcare like many other resources are limited and therefore need to be fairly distributed to the population. The distributive justice concept in healthcare utilisation is based on the notion that healthcare should be distributed according to health need. The health need concept arise from the understanding that the individual's life opportunity is impaired by significant pathology such as serious disease, injury or disability. Therefore, healthcare is obliged to correct those disadvantages or any other misdevelopment that has deprived the individual's talents and skills because of the burden of illness.

Fairness in healthcare utilisation is a critical component in every health system and to ensure that these components are equitable is the path to achieve the UHC. The objective of UHC approach is to bring about a fair distribution of health for ALL. This in general will reduce the inequalities of health and protect the disadvantaged population whenever they need to use the services. It therefore aimed to provide equal opportunity to every individual to explore life's potential although it is understood that the individual live outcome may not necessarily be equal.

CHAPTER 3: BACKGROUND OF MALAYSIAN HEALTHCARE DELIVERY SYSTEM

3.1 Introduction

In general, the development of the Malaysian economy over the years prompted significant improvement in the overall health status of the population. After independence from British rule in 1957, Malaysia experienced vast economic growth and social changes. The Malaysian health system was given great importance and has evolved through several phases of development supported by the government's strong commitment. The country's wealth was enormously invested in basic social amenities namely schools, clinics and hospitals development, for essential reasons such as to reduce the social and economic disparities between urban and rural areas, as well as to improve the general well-being of the entire Malaysian population. Nevertheless, the rapid economic growth of the country and the development of social infrastructure may not have benefitted the entire population in equal measure. Hence this study aims to assess the fairness in healthcare utilisation over a period of 15 years from 1996 to 2011, which saw rapid private health sector development that contributed significantly to Malaysia's economy.

This chapter begin with Section 3.2 which describes briefly about Malaysia background from the perspective of geography, economy and general health status of the Malaysian population. Section 3.3 describes the evolution of the healthcare delivery system, the current scenario of the present health system and socioeconomic and healthcare situation since independence up to recent

development. Section 3.4 describes the pattern of healthcare utilisation in Malaysia and this chapter concludes with Section 3.5 which summarises the important changes and progress relevant to this study, especially on the equity aspect of healthcare utilisation in Malaysian health system.

3.2 Malaysia Background

In general, every county's health system is unique because the structure of a country's health system is varied and influenced by numerous factors such as the country's political stability and economic growth. In this respect, the health system in Malaysia has existed for a long time to protect the populations'. The system has evolved depending on various factors shaping the country's profiles such as demographic, culture, historical, economic and political scenario. The Malaysian system has undergone many changes since the colonial period, post-independence and until today and is still expanding and improving in order to deliver the best services to the population. A better understanding of the Malaysian health system can be attained after appreciating the background of this country with regards to geography, economy and demographic structure of the Malaysian population.

3.2.1 Geography and economy

Malaysia is part of South East Asia and comprises of Peninsular Malaysia (West Malaysia) and the states of Sabah and Sarawak (East Malaysia). It has a total land area of 330,252 kilometers whereby Thailand, Singapore and Indonesia are the closest neighbors and share their borders with this country. Malaysia enjoys hot and humid tropical climate with the humidity of 80 per cent all year round and temperatures ranging between 21-32°C. Much of Malaysia's land is mountainous and "the Titiwangsa range and the Crocker range" form the back bone of Peninsular Malaysia and East Malaysia respectively. It is estimated that four-fifths of Malaysia is still covered by tropical rain forest which makes it rich with valuable tropical tress and several varieties of flowering plants, birds, mammals and many other wildlife (Osborne, 2003).

Malaysia is made of 13 states and three Federal Territories, namely Kuala Lumpur, Putrajaya and Labuan which are controlled by state and federal governments respectively. Kuala Lumpur is the capital city of Malaysia. Malaysia gained its independence on 31st August 1957 after Tunku Abdul Rahman Putra Al-Haj led the country to independence through peaceful negotiation with the British Government (Osborne, 2003). Starting from a raw material producer country after independence, Malaysia is currently an upper middle-income country that has transformed into a multi-sectoral driven economy (Economic Planning Unit, 2013a; Ministry of Health, 2004). In 2013, the Malaysian economy was the third largest in South East Asia after

Indonesia and Thailand and ranked 29th in the world. The Gross Domestic Product of Malaysia stands at USD 10,265 per capita and USD 313.2 billion (Figure 1.1)

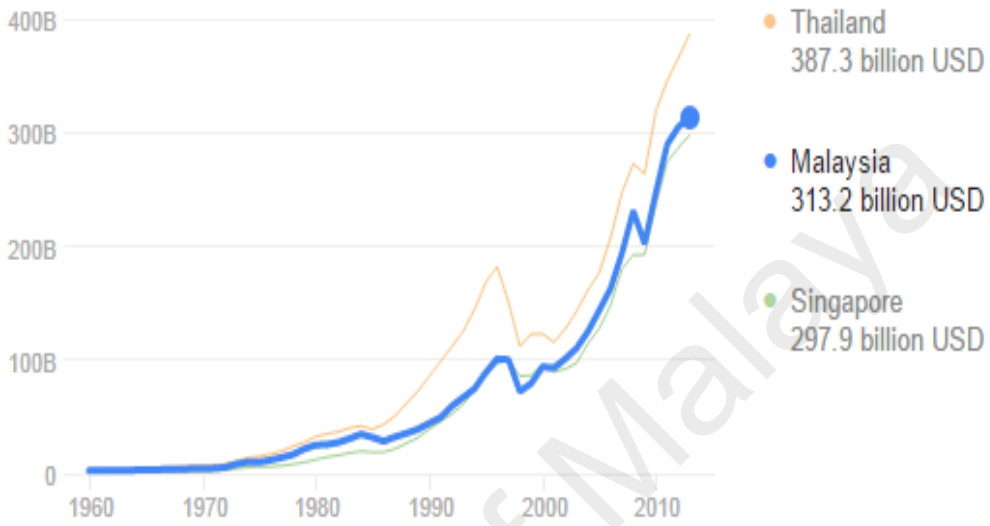


Figure 1.1: Gross Domestic Product, from 1960-2013 (Economic Planning Unit, 2013a)

3.2.2 Health status indicator and demographic characteristic

Life expectancy at birth is known to be one of the best measures of a population's health status and is often used to gauge a country's health development (OECD, 2009). The life expectancy in Malaysia continues to increase remarkably and is comparable with many Asian countries. These gains in longevity are attributed by several factors including increase in educational level, greater access to quality health services and rising standard of living. Figure 2.1 illustrate the life expectancy at birth in 1970 and 2010 across Asia and OECD countries (OECD, 2009).

Table 1.1: Malaysia Health facts 2009 – 2013 (Ministry of Health, 2012, 2014a)

	2010	2011	2012[p]	2013[e]
Total population	28,588.6	28,964.3	29,336.8	29,714.7
Annual Population Growth Rate (%)	1.7	1.3	1.3	1.3
Crude Birth Rate (Per 1,000 population)	17.5	17.6	17.2	17.2
Crude Death Rate (Per 1,000 population)	4.8	4.7	4.6	4.7
Stillbirth Rate (Per 1,000 Births)	4.6	4.5	4.3	4.6
Perinatal Mortality Rate (Per 1,000 Births)	7.8	7.6	7.4	NA
Neonatal Mortality Rate (Per 1,000 Births)	4.4	4.2	4.0	NA
Infant Mortality Rate (Per 1,000 live Births)	6.8	6.5	6.3	6.6
Maternal Mortality ratio (Per 100,000 live Birth)	27.3	26.2	25.6	NA
Life Expectancy at Birth (In years)	Male: 70.4 Female 77.0	Male: 74.3 Female: 76.8	Male: 70.4 Female: 77.0	Male: 72.6 Female: 77.2

Note: [e]: estimated data, [p]: preliminary data, NA: Not available

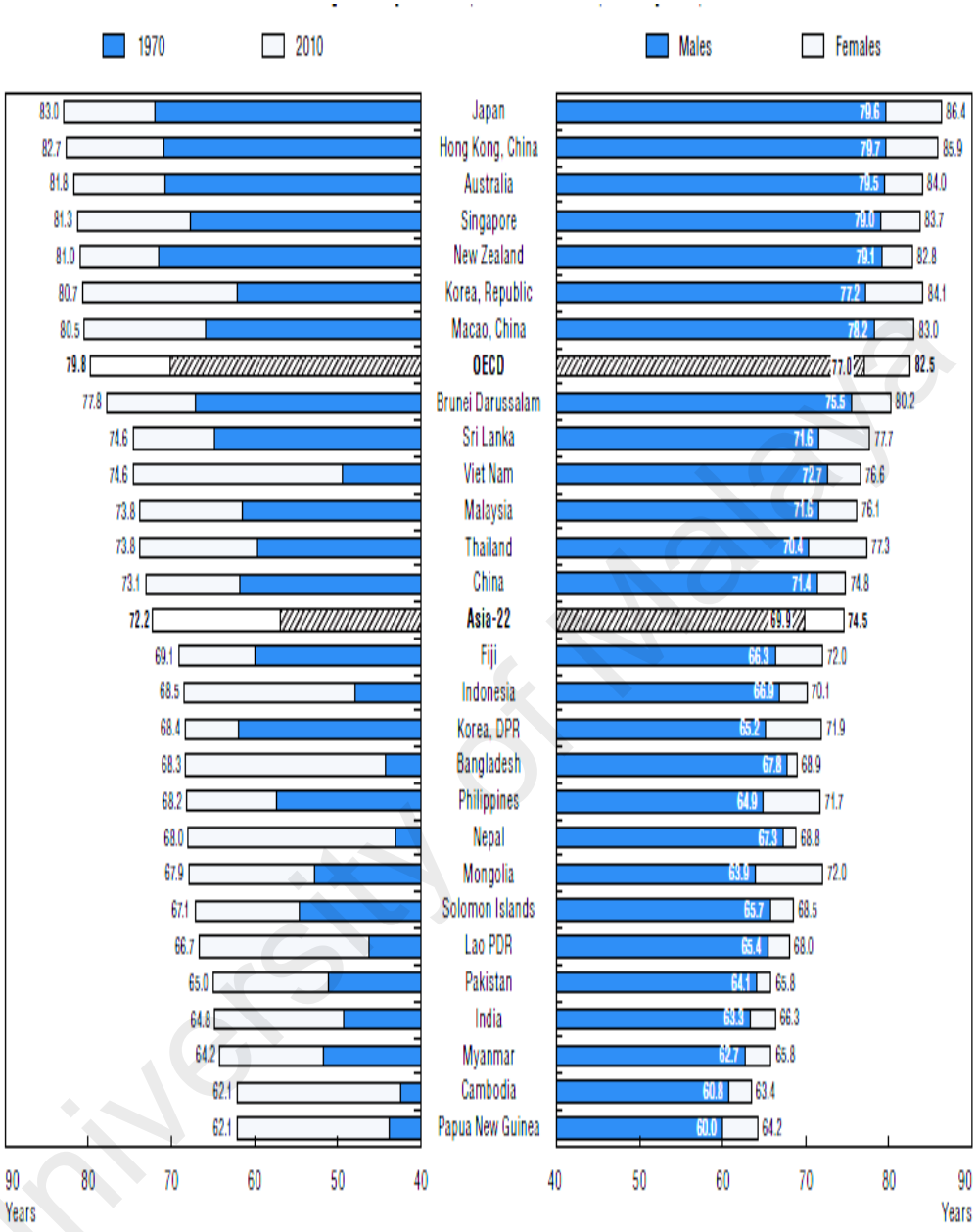


Figure 2.1: Life Expectancy at Birth 1970 and 2010 by sex, 2010 (OECD, 2009)

Table 2.1: Mid-Year Population Estimates by Ethnic Group, 2011-2013 (Department of Statistics Malaysia, 2013a)

Ethnic Group	**2011**		**2012**		**2013**	
	(‘000)	(%)	(‘000)	(%)	(‘000)	(%)
Malay	14,545.6	50.2	14,771.8	50.4	15,003	50.5
Chinese	6,474.9	22.4	6,517.4	22.2	6,559	22.1
Other Bumiputras	3,416.6	11.8	3,479.3	11.9	3,543	11.9
Indian	1,942.5	6.7	1,959.9	6.7	1,977	6.7
Others	238.7	0.8	245.6	0.8	253	0.9
Malaysian	26,618.2	91.9	26,974.1	91.9	27,336	92.0
Non -Malaysia	2,346	8.1	2,362.7	8.1	2,379	8.0
Total	**28,964.3**	**100**	**29,336.8**	**100**	**29,715**	**100**

Note: Mid-year population estimates based on the adjusted population and census of Malaysia 2010

Malaysia has an interesting diverse demographic composition whereby the three largest communities are Malays, Chinese and Indians and can be viewed as representing samples of three of the world’s most populous countries namely Indonesia, China and India (Richard Leete, 1996). The population comprised Malays (50.5 per cent) followed by Chinese (22.1 per cent), Other-Bumiputras (11.9 per cent) and Indians (6.7 per cent) (Table 2.1). The distribution of these ethnic groups historically has markedly affected the country’s development and has influenced many government policies especially in healthcare development which would further be elaborated in the next section.

3.3 Malaysian Healthcare System

3.3.1 Origin of Malaysian healthcare

The unique feature of Malaysia's health system can be understood from the historical background of its medical practices. Before the colonisation period, indigenous people in this country use traditional medicine to treat illnesses. During the 14th century the foreign traders from China, India and the Arabian countries in Peninsular, brought along their traditional practices and was incorporated with local medical practise (Irwin, 1991). Western medicine was formally introduced in Malaysia during the British colonial era. Modern or western medicine was developed in this country to guarantee the continuity of economic activities and to treat British officers who required care at that time.

Health issues such as malaria and water-borne infections like Cholera caused many deaths among plantation and tin mine workers which forced the British government to start investing in basic healthcare services and safe water supply. The Institute of Medical Research (IMR) was set up in 1900 for investigation and management of tropical diseases as well as to improve environmental sanitation (Leng, 2007). In general, the basic structure of the current healthcare system was already in place during the early years of the twentieth century. The first General Hospital was established in 1910 and civil servants were given the privilege to enjoy free healthcare services. Ward allocation were based on the individual's rank in the civil service. The increasing demand for healthcare services increased the needs for more healthcare professionals.

The first faculty of Medicine for Malaya was set up in 1905 in Singapore to cater for this need. After Singapore separated from Malaysia in 1963, a new medical faculty was established in University Malaya in Kuala Lumpur in 1969. Charitable missionary-led hospitals were also set up around this time with the intention to help the poor, using funds that were obtained through donations from the businessmen and money collected from specific taxations imposed on the rich communities. Labor legislation was also enacted during that time making it mandatory for the profitable tin and rubber companies to provide healthcare for their employees. Small Estate hospitals were also established but it was never meant to provide high level healthcare. A number of dispensaries and maternal and child clinics were built in some areas to increase accessibility to healthcare.

Many healthcare facilities were built before the Second World War but after the Japanese Army invasion during Second War World, more facilities were added and relocated. For example, communist activities which emerged to fight the Japanese army after the Second War World created a lot of chaos and led to some communities to be relocated. The Rural Chinese were relocated to new settlements called 'New Villages' by the British Government. This relocation was designed to control the communist movements by cutting off the food supply, medicine and moral support to the Communist. To make the new settlement more attractive, midwifery clinics and first aid facilities were established within the new settlement areas. Catholic missionaries were also encouraged to establish new hospital such as Asunta Hospitals in Petaling Jaya

and Fatimah Hospital in Ipoh. The provision of the healthcare services was eventually extended to the rural population after the Emergency period (Leng, 2007).

3.3.2 Socioeconomic and healthcare changes

The Malaysian health system was developed to accomplish the objective to improve the population's health. This objective is illustrated by the strengthening of the healthcare services and improvement of the healthcare facilities under several economic policies especially in the New Economic Policy (NEP) programmes from 1970 to 1990. This national development plan was formulated as a reaction to post-election race riots which occurred in May 1969. After that incident, the Malaysian government realised that it was important to grow and develop with equity. The government decided to strengthen economic development and distribute wealth and health, equitably to the population.

The New Economic Policy (NEP) was introduced with the purpose to eradicate poverty regardless of race and rearrange the society by eliminating the race identification by economic function. Healthcare became an important contributor to those changes and during the duration of 20-years the implementation of NEP programme witnessed great changes in Malaysia (Mohamad Zaini, 2014). The rapid development of the national economy has produced significant changes in the people's standard of living, society's structure and distribution. From 1970 to 1990, the country's real GDP was reported to grow at an average of 6.7 per cent per annum and this has directly

reduced the poverty rate among the people in the country from nearly half (49.3%) of all households in Peninsular Malaysia who were living in poverty in 1970 to 16.5 % in 1989 (Table 3.1). However, the reduction of poverty rate does not give the full picture of the income status for the Malaysian population. The Gini Coefficient (0.41) in 2014, shows that the gap of income between the rich and the poor is still significant (Economic Planning Unit, 2015).

Although equity policy for healthcare was never explicitly developed within the NEP, the government has shown a strong commitment to improve the country's health infrastructure. Equity in healthcare was reflected in terms of improving healthcare accessibility to provide equal opportunity for people to use the healthcare services, regardless of geographical distribution and socioeconomic disadvantages. The National Health Plan that spanned over a period of 44 years from1966 to 2010 (Table 4.1), placed emphasis on expanding the healthcare services especially to the rural areas. During this period many existing healthcare facilities were upgraded to enhance equality in access.

Beginning from 1986, MOH started to introduce broader equity concept in healthcare under the HFA policy that is in line with the global initiative to improve the population's health status (Alma Ata Declaration in 1978). It was aimed to bring healthcare nearer to everyone. HFA focuses on Primary Healthcare (PHC) approach and has enhanced collaborative work between the federal and state governments to upgrade basic amenities such as provision of

electricity, water and sewage facilities and subsequently contributed to improve the health population's status. The primary healthcare services were restructured and extensive capital was invested to construct new clinics and hospitals in every district.

The period from 1980 to 2000 saw the transformation of new national development policy. The government started moving towards capital intensive and sophisticated technology industries and introduced several new initiatives to create a more balanced economic development. This movement encouraged the private sectors to grow and the private healthcare providers were included in the development plan. The growing of private healthcare facilities providers was mostly driven by the rising demand for better healthcare especially by the affluent members of the population. Although the increasing number of private healthcare providers helped to improve healthcare accessibility especially in urban areas, however the presence of many private healthcare providers has widened the equity gap between the urban and rural areas. The rich people in urban areas were able to utilize the private healthcare services which were perceived to be of better quality than the public services while, the poor in the rural areas still have to rely on public health facilities that operate mainly during office hours and excluding weekends.

Table 3.1: Incidence of household Poverty, 1970-2012 (per cent)(Economic Planning Unit, 2013b)

	1970	**1976**	**1979**	**1984**	**1987**	**1989**	**1992**	**1995**	**1997**	**1999**	**2002**	**2004**	**2007**	**2009**	**2012**
Rural	58.7	45.7	45.8	27.3	24.8	21.1	21.2	14.9	10.9	14.8	13.5	11.9	7.1	8.4	1.0
Urban	21.3	15.4	17.5	8.5	8.5	7.1	4.7	3.6	2.1	3.3	2.3	2.5	2.0	1.7	3.4
Malaysia	49.3	37.7	37.4	20.7	19.4	16.5	12.4	8.7	6.1	8.5	6.0	5.7	3.6	3.8	1.7

Note: 1970, refers to Peninsular Malaysia only; b) Starting 1989 data is based on Malaysian citizen

During the period of 2000 to 2010 the focus was to further improve the healthcare services for the population. Emphasis was given to preventive and curative health services where more specialist care was expanded in scope to include cardiothoracic surgery, oncology, nuclear medicine, nephrology and urology services. New information technology (IT) based hospitals were built to support the implementation of tele-health network. New multidisciplinary and self-contained ambulatory care centres were built in selected hospitals to ensure optimum utilisation of diagnostic and therapeutic facilities. Selected clinics were equipped with tele-primary healthcare network linked to state and district hospitals to facilitate tele-consultation and access to specialist diagnostic services as well as to facilitate quick referrals for secondary and tertiary care (Lai Lin, 2008). All of these improvements were targeted to improve the quality of services especially with emphasis for specialist care to serve the public.

Through many years, Malaysia's healthcare system has basically undergone several phases of development. The earliest phase was the post independent period which involved expansion of healthcare coverage to the rural population and the government took more than forty years to rectify the imbalances between the urban and rural areas. Two main issues that seem to undermine the government's effort to correct this imbalance were the shortage of manpower and financial constraints. Beside the focus on promoting equitable distribution of healthcare resources, the healthcare system in Malaysia is also challenged with issues like efficiency, effectiveness and

quality that further create a wider gap between the urban and rural utilisation pattern.

3.3.3 Current Healthcare Scenario

Currently, the Malaysian government through the MOH is still the main healthcare provider in the country. The Malaysian healthcare system has frequently been commended by WHO and international agencies for being able to achieve impressive health outcome while operating within limited resources (United Nations, 2011)

The health status data from 1970 to 2012 showed significant improvement on several important health indicators such as Maternal Mortality Ratio (MMR), Infant Mortality Rate (IMR) and Life-Expectancy. The Life Expectancy at birth for men increased from 61.6 years in 1970 to 72.6 years in 2013 and for women, the value increased from 65.6 to 77.2 years for the same time period. Infant Mortality Rate reduced dramatically from 39.4 to 6.6 for every 1000 life birth and Maternal Mortality Ratio declined from 1.4 to 0.3 for every 1000 live births (Table 1.1). Improvements on healthcare facilities were gradually implemented following the Malaysia Plan which was initiated since 1966 (Prime Minister's Department, 2015). As illustrated in Table 4.1, the health facilities were upgraded and the number of trained health personnel were also increased accordingly to meet the population’s health needs (Lai Lin, 2008).

Table 4.1: Specific features of Malaysia Health Plans (Lai Lin, 2008; Ministry of Health, 2010)

Health Plan	Target
1st (1966-1970)	Rural health service (RHS) establishment. Upgrading district hospital as referral centre from the rural clinics
2nd (1971-1975)	Consolidate the exiting services with emphasis on rural services Training Improvement on General & Specialised Medical facilities Increase the number of bed.
3rd (1976-1980)	Consolidate and expand the rural health services Dental health services Improvement & construction of new hospitals
4th (1981-1985)	Curative and rehabilitative facilities Training
5th (1986-1990)	Consolidate existing health services with emphasis on Rural services to achieve "HEALTH FOR ALL"
6th (1991-1995)	Consolidate existing health services with emphasis on Rural services to achieve "HEALTH FOR ALL"
7th (1996-2000)	Primary healthcare Information technology Ambulatory care Alternative Birthing Centre (ABC)
8th (2001-2005)	Rural health to expand & strengthen Urban health enhancement (health cities concept) Information technology Training
9th (2006-2010)	Upgrade and renovate existing hospitals Improve urban health services Improvement & construction new hospitals
10th (2011-2015)	Health awareness & healthy lifestyle activities Community empowerment Effectiveness and efficiency of the health sector Delivery system to ensure universal access

i. Primary Healthcare

Since 2000, basic healthcare services was made available to more than 95 per cent of the population in Peninsular Malaysia and reaching up to 70 per cent for population in Sabah and Sarawak (Rasiah R. et al., 2011). Evolving from a three-tier model established in 1953 to a two tier system in 1970s, the Primary Healthcare (PHC) network in Malaysia has substantially expanded rapidly starting from only seven health clinics in 1957 to a total number of 2,878 clinics in 2013 (Table 5.1). In the provision of primary healthcare, Health Ministry has managed to achieve the good target of clinics to population ratio. There is one health clinic or health centre for every 20,000 population while there is one community or rural health clinic for every 4,000 people. The range of services provided include curative, family health, dental, health promotion, home nursing, adolescent health and community mental services (Cruez, 2008).

Table 5.1: Primary Healthcare Facilities 1957 – 2013 (Leng, 2007; Ministry of Health, 2012, 2014a)

Facilities	**1957**	**1970**	**1980**	**1990**	**2000**	**2010**	**2011**	**2013**
Community clinic	0	943	1509	1880	1924	1919	1864	1839
Health clinic	7	224	725	708	947	812	985	1039
Total	7	1167	2234	2588	2871	2731	2849	2878

The healthcare services in the rural areas are mainly dominated by the public facilities and by 2013, there were almost 2,900 public health clinics available throughout every rural area in this country. On the other hand, private clinics were growing faster in the urban areas especially after the late 1980s. It was mainly driven by the population's demand for better healthcare. As in December 2011, there were 6,589 private medicals clinics and 1,576 private dental clinics available in the country (Leng, 2007; Ministry of Health, 2012). The density for both private and public primary clinics also rose from 1.7 in year 2000 to 2.09 per 10,000 populations in year 2009 (Table 6.1) with the highest density being in Wilayah Persekutuan Kuala Lumpur and the lowest density seen in Sabah at 1.02 per 10,000 population (Ministry of Health, 2011d)

Table 6.1: Number and Density of Primary Care Clinics in Malaysia (Ministry of Health, 2011d, 2014c)

Sector	**2000**		**2005**		**2009**		**2011**	
	No	Per 10,000 population	No	Per 10,000 population	No	Per 10,000 population	No	Per 10,000 population
Public	701	**0.3**	781	**0.3**	806	**0.3**	871	**0.3**
Private	3,258	**1.4**	4,359	**1.7**	5,104	**1.8**	5,198	**1.8**
Total	**3,959**	**1.7**	**5,140**	**2.0**	**5,910**	**2.1**	**6,069**	**2.1**

ii. In-patient care

Malaysian enjoys a fairly comprehensive range of health services through its dual system of private and public healthcare facilities. Currently the government is still leading in providing healthcare through its public health facilities. Hospital services in the rural areas are mainly dominated by the public facilities. In 1990, there were only 95 public hospitals available in the country with a total number of 23,223 beds (Table 7.1). This number steadily increased every year. By the end of 2013, the number of public hospitals had increased by 48 per cent, comprising a total of 141 hospitals and number of beds increased by almost 71 per cent with a total of 39,724 beds (Ministry of Health, 2014a).

Table 7.1: Public Hospital facilities, 1990 – 2013 (Ministry of Health, 2014a)

Facilities	**1990**	**2013** (as of 31 December)
No. of Public Hospital	95	141
No. of Beds	23,223	39,724

Private hospitals proliferated faster in the urban areas. This is due to weaknesses of the public healthcare facilities to deliver quality healthcare services and triggered by the increasing demand by the affluent members of the population in urban areas (Leng, 2007). For example, in 1999, 97.8 per cent of the private hospital beds were available in urban areas. Table 8.1 shows that the majority of private hospitals were located in the large cities and

urban areas namely in Federal Territory of Kuala Lumpur, the states of Selangor, Johor and Penang which account for 67 per cent of its total number.

Table 8.1: Private Hospital facilities distribution by state, 2009 & 2011 (Ministry of Health, 2011d, 2013c)

State	**(2009)**	**(2011)**
Johor	29	30
Kedah	11	9
Kelantan	3	3
Melaka	4	4
Negeri Sembilan	6	9
Pahang	7	9
Penang	23	22
Perak	15	16
Perlis	0	0
Selangor	46	49
Terengganu	1	1
Sabah & Labuan	6	5
Sarawak	9	12
Federal Territory (KL)	41	36
Total	201	205

The density for both private and public hospitals also increased from 0.11 in year 2000 to 0.12 per 10,000 populations in year 2011 (Table 9.1).

Table 9.1: Number and density of Hospitals, year 2000 to 2011 (Ministry of Health, 2011d, 2013c)

	2000		2005		2009		2010		2011	
	No	Per 10,000 population	No	Per 10,000 population	No	Per 10,000 population	No	Per 10,000 population	No	Per 10,000 population
Public	113	0.05	122	0.05	133	0.05	134	0.05	134	0.05
Private	141	0.06	172	0.06	201	0.07	203	0.07	205	0.07
Total	**254**	**0.11**	**294**	**0.11**	**334**	**0.12**	**337**	**0.12**	**339**	**0.12**

The Malaysian public hospitals are generally organised into several levels of starting with district hospitals without specialists to district hospital with specialists, state hospitals, national level hospital, university hospitals and institutions hospitals. The highest level of care is the national level hospitals which has the capacity to treat more than 2,000 in-patients at any one time. The national level hospitals provide tertiary level of services and they normally receive the biggest budget allocation. They are well equipped with high-tech facilities and are managed by a large number of health staff. State hospitals however are situated in the capital city of each of the 13 states in Malaysia. They are basically large hospitals with the bed strength of 200-800 depending on the population density in the state. These hospitals have well-equipped facilities with a large number of staff and provide a comprehensive range of secondary

Table 10.1 : Distribution of private and public acute care hospital beds in Malaysia, 2010 (Department of Statistics, 2010; Ministry of Health, 2013c)

	Population Estimates ('000)	**No. of Public Hospitals**	**No. of Public Hospital Beds**	**Public hospital beds:100,000 population**	**No. of Private Hospitals**	**No. of Private Hospital Beds**	**Private hospital beds: 100,000 population**
Perlis	232	1	404	174.14	0	0	0.00
Kedah	1,948	9	2,350	120.64	10	542	27.82
Penang	1,561	6	1,939	124.22	23	2,135	136.77
Perak	2,353	14	3,470	147.47	15	988	41.99
Selangor[1]	5,535	12	4,797	86.67	48	2,836	51.24
K. Lumpur	1,675	4	4,137	246.99	37	2,859	170.69
N. Sembilan	1,021	6	1,527	149.56	8	428	41.92
Malacca	821	3	1,006	122.53	4	690	84.04
Johor	3,348	11	3,609	107.80	30	1,111	33.18
Pahang	1,501	10	1,907	127.05	7	204	13.59
Terengganu	1,036	6	1,342	129.54	1	20	1.93
Kelantan	1,540	10	2,399	155.78	3	162	10.52
Sabah[2]	3,294	22	3,962	120.28	5	165	5.01
Sarawak	2,471	20	3,407	137.88	12	465	18.82
Malaysia	**28,334**	**134**	**36,256**	**127.96**	**203**	**12,605**	**44.49**

Note: [1]Including Federal Territory of Putrajaya. [2]Including Federal Territory of Labuan

care services. District hospitals provide basic in-patient care services. Certain district hospitals with specialists provide some secondary level of health services. District hospitals without specialists are generally smaller with beds ranging from 30 to 150, while those district hospitals with specialists normally have a larger bed capacity ranging from 200 to 500 (Manaf, 2009).

iii. Healthcare Expenditure

Malaysia's healthcare system is basically financed through multiple sources of payment(Chai, 2008). The private healthcare provider is sustained by patient's private health insurance and out-of pocket payments, while the public healthcare providers are heavily subsidised by government through taxation fund obtained via the annual health budgets allocated to Ministry of Health (Chua, 2012). The private sector workers are normally covered by the welfare health benefits or insurance package provided by the employer. Some of them purchase their own private health insurance to cover for healthcare benefit and to protect them from catastrophic healthcare payment. In 2013, the private health insurance contributes only 7 percent out of the total Malaysia healthcare expenditure compared to the OOP and general taxation which accounted for 39 percent and 50 percent respectively (Ministry of Health, 2015). Public sector employees, their immediate family members (parents and children) and retirees on the other hand, enjoy free access to medical services, provided by the government. Some of the government servants also purchase private health insurance especially among those with higher incomes who can afford to pay for private healthcare services.

At one point, both the public or private facilities required an out-of pocket (OOP) payment and private facilities in particular, constitute a substantially large proportion of these OOP payment (Leng, 2007). The healthcare provided by public health facilities is being subsidised almost 98 per cent by the government (Chua, 2012). In 1983, the government contributing 76 per cent from the overall healthcare expenditure, but the 2012 data of Malaysia's national healthcare expenditure revealed that the government had eventually subsidised a lower fraction of the health sector costs with only 53.2 per cent while the remaining 46.8 per cent, was financed by the private sector.

The majority of private finance sources came from out-of-pocket payments (73.2 percent) and a minor component was obtained from the private insurance payments (14.4 percent). The 2009 data documented that government health expenditures (RM14, 653 million) were almost matched with Out-of-Pocket expenditures (RM13, 182 million), and this trend was observed to continue for more than ten years (Leng, 2007). Budget allocated for healthcare in Malaysia has increased very slightly from 5.2 per cent to 6.6 per cent from 1980 to 2001 compared with total revenue of RM900 billion in 1980 to 5.7 trillion in 2001 with an annual average of 25 per cent. This shows that healthcare expenditure in Malaysia is still relatively small as a percentage of the country's GDP per year as illustrated in Table 11.1 (Ministry of Health, 2010).

Table 11.1: Public Private Health Expenditure 1997 – 2012 with percentage of expenditure from GDP (Ministry of Health, 2014b)

Facilities	**97'**	**98'**	**99'**	**00'**	**01'**	**02'**	**03'**	**04'**	**05'**	**06'**	**07'**	**08'**	**09'**	**10'**	**11'**	**12'**
Government	4,413	4,800	5,299	6,304	7,399	7,954	10,455	10,616	9,712	12,625	13,811	15,738	17,847	19,614	20,378	22,461
(%)	53.3	53.7	54.0	54.0	57.1	56.2	58.4	55.3	49.9	53.6	52.9	54.1	56.9	55.1	52.9	53.2
Private	3,873	4,147	4,519	5,381	5,568	6,206	7,447	8,583	9,735	10,933	12,281	13,354	13,547	15,965	18,173	19,795
(%)	46.7	46.3	46.0	46.0	42.9	43.8	41.6	44.7	50.1	46.4	47.1	45.9	43.2	44.9	47.1	46.9
Total (%)	**2.9**	**3.2**	**3.3**	**3.3**	**3.7**	**3.7**	**4.3**	**4.1**	**3.6**	**4.0**	**3.9**	**3.8**	**4.4**	**4.5**	**4.4**	**4.5**

Note: Million Ringgit Malaysia

Despite expansion of primary care services, hospital services and increases in health expenditures, there still appear some maldistribution of facilities in favour of those who are rich or those living in more developed areas. Analysis done based on the information collected in National Health and Morbidity Survey (NHMS) data set illustrates these findings.

The NHMS has been conducted by MOH since in 1986 and regularly done since then at ten years interval until 2006. The survey is now expected to be conducted for every five years. The main objective of the NHMS is to obtain community-based information for the MOH to review the health priorities, programme strategies as well as for planning and resources allocation. The NHMS is a nationally representative data and the information collected covers a wide range of health related information including the household's income and distance from the nearest healthcare facilities. Therefore has allowed the following analysis to be made. The full description about NHMS will be discussed in the next chapter.

iv. Distance of Health Facilities from the average household in Malaysia

The healthcare facilities has been increasingly made available throughout the country following the Malaysian Health Plan initiated since 1963 but the average distance (km) from the health facilities still varies across different areas such as urban, rural area, Peninsular Malaysia and East Malaysia. The distribution of health facilities had improved from the year 1996 to 2006 and urban populations were seen as having the advantage of staying nearer to both public and private facilities, compared to the rural populations. In 1986/87, 74

per cent of population in Peninsular Malaysia stayed within three km of a static health facility and 89 per cent stayed within five km but in 1996, improvement was seen when these proportions were noted to increase to 81 per cent within three km and 93 per cent stayed within five km away from a static health facility. Health facilities were generally located nearer to the area where rich people live than the poor.

As illustrated in Table 12.1 for population belonging to the poorest income quintile, the average distance to nearest public facilities was 5.7 to 7.1 km and the nearest public hospital was 22 to 24.7 km compared with the richest quintile group which generally stayed 3.9 to 4.6 km to the nearest public clinic and 11.1 to 11.9 km to the nearest public hospital. For the private facilities, the nearest private clinic for the poorest quintile was 15.3 to 16.6 km and the nearest private hospital was between 111.0 km to 159.4 km compared with the richest quintile group where the nearest private clinic distances was only 3.0 km to 3.7 km and the nearest private hospital was only 26.1 to 37.3 km away.

There were also regional disparities between the different states in Malaysia and between urban, rural, peninsular Malaysia and East Malaysia. The larger states of Sarawak, Sabah and Pahang were observed to have longer average distance from both public out-patient facilities and hospital facilities. Those states were also noted to have longer distance from both private out-patient and in-patient facilities. In Sarawak, only 60 per cent of its population lived within a 5 kilometre radius, in Sabah 76 per cent, while in Pahang 79 per cent. In general, these three states generally are less developed compared to the

other states in Malaysia and are compounded with relatively poorer transportation and communication facilities as well. All of these disadvantages may affect the utilisation pattern of the healthcare services especially among the less advantaged group (Table 13.1).

Disparities of distances from healthcare facilities were also obvious between the urban rural areas of Peninsular Malaysia and East Malaysia. Only 50 per cent of the rural population in Sabah and 62 per cent in Sarawak live within five kilometres of the health facilities. The population in Peninsular Malaysia have better accessibility for public and private facilities compared with the population in East Malaysia and people in urban areas were nearer to the health facilities compared to people in the rural areas (Table 14.1).

Table 12.1: Average Distance (Km) From Health Facilities by Income Quintile (Author's estimates from the NHMS data sets)

Income Quintile (Monthly per capita Household income)	**Public Clinic**		**Public Hospital**		**Private Clinic**		**Private Hospital**	
	1996	**2006**	**1996**	**2006**	**1996**	**2006**	**1996**	**2006**
Poorest	6.0	6.0	23.4	17.2	15.4	10.8	151.1	81.6
2nd Quintile	4.7	6.6	19.4	17.8	10.3	9.9	110.2	76.0
Middle Quintile	4.1	5.2	16.2	16.5	7.8	7.3	84.5	55.0
4th Quintile	4.1	5.1	14.3	15.0	5.8	7.1	64.5	43.9
Richest	4.2	4.9	12.6	13.5	4.5	4.7	51.2	31.7

Table 13.1: Average Distance (Km) from Health Facilities by States (Author's estimates from the NHMS data sets)

State	Public Clinic		Public Hospital		Private Clinic		Private Hospital	
	1996	**2006**	**1996**	**2006**	**1996**	**2006**	**1996**	**2006**
Johor	3.1	8.2	18.0	17.8	5.1	7.3	24.3	29.7
Kedah	3.4	3.7	14.0	11.9	6.3	4.9	25.0	22.5
Kelantan	2.0	3.4	13.5	13.7	6.5	7.0	362.2	37.5
Malacca	3.4	2.6	11.4	8.4	5.5	2.9	20.6	16.4
N.Sembilan	3.7	5.6	18.3	15.6	7.3	4.7	28.0	32.9
Pahang	4.3	5.1	23.8	22.2	15.1	13.8	103.6	86.9
Penang	2.7	3.0	9.4	9.7	2.3	2.0	10.1	9.0
Perak	3.4	4.6	13.6	15.5	5.7	5.8	41.2	39.5
Perlis	3.2	3.5	10.7	14.1	4.4	4.1	42.6	40.2
Selangor	4.1	4.4	11.2	14.4	2.1	3.6	17.5	15.8
Terengganu	2.6	4.1	19.0	17.6	9.4	7.5	186.7	87.9
Sabah	7.4	6.5	20.6	15.7	14.0	10.2	230.6	228.4
Sarawak	14.1	11.4	38.0	28.9	34.6	25.6	225.9	82.9
K.Lumpur	3.3	3.5	10.1	6.5	0.8	1.4	6.1	5.2

Table 14.1: Average Distance (Km) From Health Facilities by Urban & Rural (Author's estimates from NHMS data sets)

Urban and rural strata	Public Clinic		Public Hospital		Private Clinic		Private Hospital	
	1996	**2006**	**1996**	**2006**	**1996**	**2006**	**1996**	**2006**
Urban	3.6	4.6	8.7	10.4	2.1	3.3	52.3	32.3
Rural	5.7	6.8	25.9	24.1	15.3	14.4	127.0	88.8

3.3.4 Disease pattern and epidemiological transition

The United Nation's 2010 *Revision of World Population Prospects*, show that the life expectancy at birth of the world's population rose from 48 years in 1950-1955 to 68 years old in 2005-2010 (United Nations, 2012). The improvements in life-expectancy occurred in relation to the demographic transition of the causal-specific morbidity and mortality pattern over time. This has been observed in many parts of the world. The pattern that is also known as epidemiologic transition is characterised by two population features namely decreases in the rate of death which subsequently is followed by reduction in mortality (Figure 3.1).

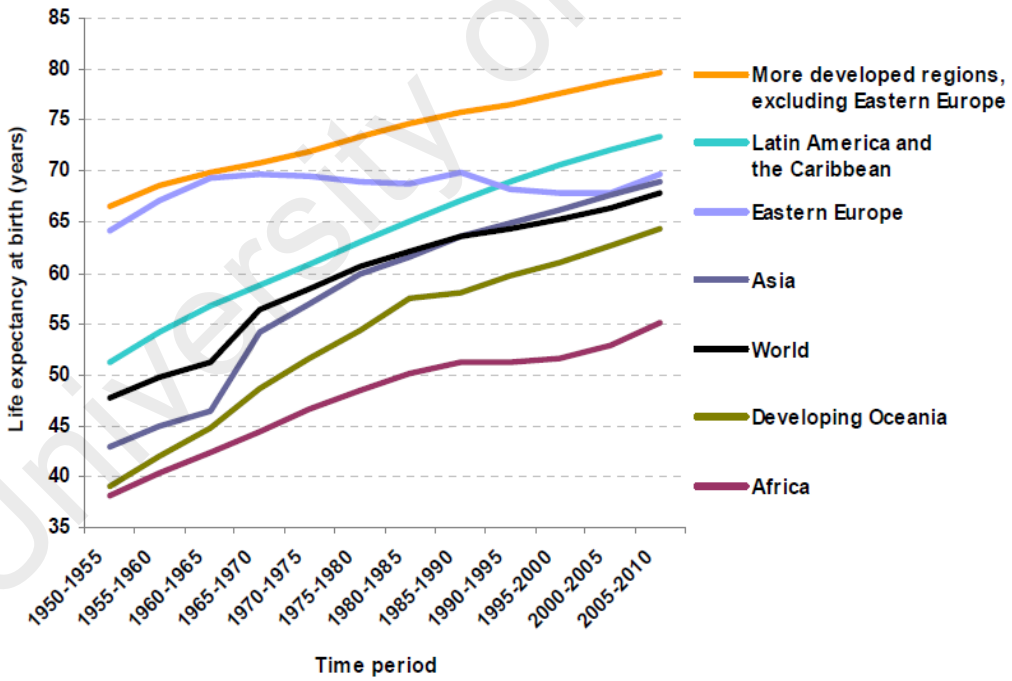


Figure 3.1: Life expectancy at birth for the world and selected regions, 1950-1955 to 2005-2010 (United Nations, 2012)

In this respect, the Malaysian population has been observed to be enjoying longer life expectancies as stated earlier in section 3.3.3. Rapid economic development and major social changes over half of a century have influenced the socioeconomic landscape and has given a salient impact on population growth, demographic composition, and changes in disease patterns. The Malaysia's economy growth in terms of the Gross National Product (GNP) per capita, has increased from RM 8,748 in 1980 to RM 23,669 in 2010 (Table 15.1). The incidence of poverty among Malaysians at the same time, has reduced from 49.3 % in 1970 to 1% in 2014 (The World Bank, 2015).

Persistent commitment by the government to improve the educational facilities has improved literacy rates thus reducing educational discrepancies between males and females. The post-independence socioeconomic transformation not only has improved the overall living standards and better educational levels but has significantly improved the health status, through proactive public health involvement mainly in the provision of clean water supply, proper sanitation, effective prevention and control of infectious diseases and development of a comprehensive network of rural health services. All of these factors have contributed to reduce dramatically the morbidity and mortality rates in Malaysia. This reduction has also contributed by the improvement in the childhood immunisation coverage over the years (Table 16.1)

Table 15.1: Improvement in health status, Malaysia 1957 – 2012 (Department of Statistics Malaysia, 2013a)

Indicator	1957	1980	1990	2000	2012
Life Expectancy at birth (years)[1]					
Male	56.0	66.4	68.9	70.0	70.4
Female	58.0	70.5	73.5	74.7	77.0
Infant Mortality Rate [2]	75.5	23.8	13.1	6.5	6.3
Maternal Mortality Ratio[2]	3.2	0.6	0.2	0.3	0.3
Per capita GDP[2] (RM)	NA	8,748	11,988	18,353	23,669

Note: [1]Until 1990, refers to life expectancies at birth for Peninsular Malaysia only. [2] Per 1,000 live births. [3] In constant 2005 prices. NA=not available

Table 16.1: Childhood Immunisation Coverage in 2012 (Ministry of Health, 2013a)

B.C.G Immunisation coverage of infants	98.72%
DPT-HIB Immunisation coverage of infants (3rd Dose)	99.71%
Polio Immunisation coverage of infants (3rd Dose)	99.71%
MMR Immunisation coverage of children Age 1 to < 2 years	95.47%
Hepatitis B coverage of infants (3rd Dose)	98.07%

The common cause of mortality in Malaysia between post-world war two and post-independence in 1957 were communicable diseases namely tuberculosis, malaria and gastroenteritis. It was largely contributed by issues of poverty, poor sanitation and underdevelopment. However, as the country progressed over the years, the pattern of disease burden in the country started to change. Non-communicable diseases such as cardiovascular diseases and injuries became more prominent compared to communicable diseases and are related to development and urbanisation in many parts of the country (Ministry of Health, 2010). Although the prevalence of communicable diseases has markedly declined, they have yet to be eradicated (Ministry of Health, 2010). Some communicable diseases are still persistently present and cause significant morbidity and mortality. Some are directly related to the urbanisation such as the tuberculosis, sexually transmitted diseases and vector-borne diseases such as dengue (Coker R.J. et al., 2011).

The top five notifiable diseases were tuberculosis, dengue fever, food poisoning, HIV/AIDS and hand foot and mount diseases (HFMD) (Ministry of Health, 2010). The epidemics of these diseases continue to occur but are concentrated in certain parts of the country. For example, the vector-borne disease such as dengue continue to be a threat in the urban areas, especially in West Malaysia. Several states like Selangor, Penang and Kuala Lumpur have the highest number of dengue cases with the total number of annual Dengue Fever (DF) reported rising with estimates from 6692 cases in 2000, to a total number of 42,140 cases in 2010. The annual dengue death likewise increased from 45 in 2000 to 134 in 2010 (Mohd-Zaki et al., 2014).

The prevalence of non-communicable disease has continuously increased more than communicable diseases over time. Apart from demographic changes and advancement in management for the communicable diseases, the process of modernisation and urbanisation unfortunately has encouraged adoption by the population many unhealthy life styles. These include high consumption of saturated fat diet, smoking, excessive alcohol consumption and lack of physical activity. Moreover, the urbanisation process enhances industrialisation and mechanisation resulting in an increase in the incident of injuries, either from vehicles, industrial accidents or toxic chemical poisoning. All of these contribute to the increase number of NCDs namely ischaemic heart disease, mental illness, cerebrovascular illness, injuries and cancer. Those top five contributors of non-communicable diseases are similar to those seen in developed nations. In 2012, mortality rates for non-communicable disease were estimated to amount five times the rate for communicable diseases or about 73 per cent of all mortality in Malaysia (Figure 4.1 & Table 17.1).

Table 17.1: Epidemiological transition (World Health Organisation, 2014)

Country/Region	**Age-standardised Mortality Rates (Per 100,000 population)**		
	Communicable Disease	Non-communicable Disease	Injuries
Malaysia	**117**	**563**	**63**
Low income	502	625	104
Low middle income	272	673	99
Upper Middle Income	75	558	59
High Income	34	397	44

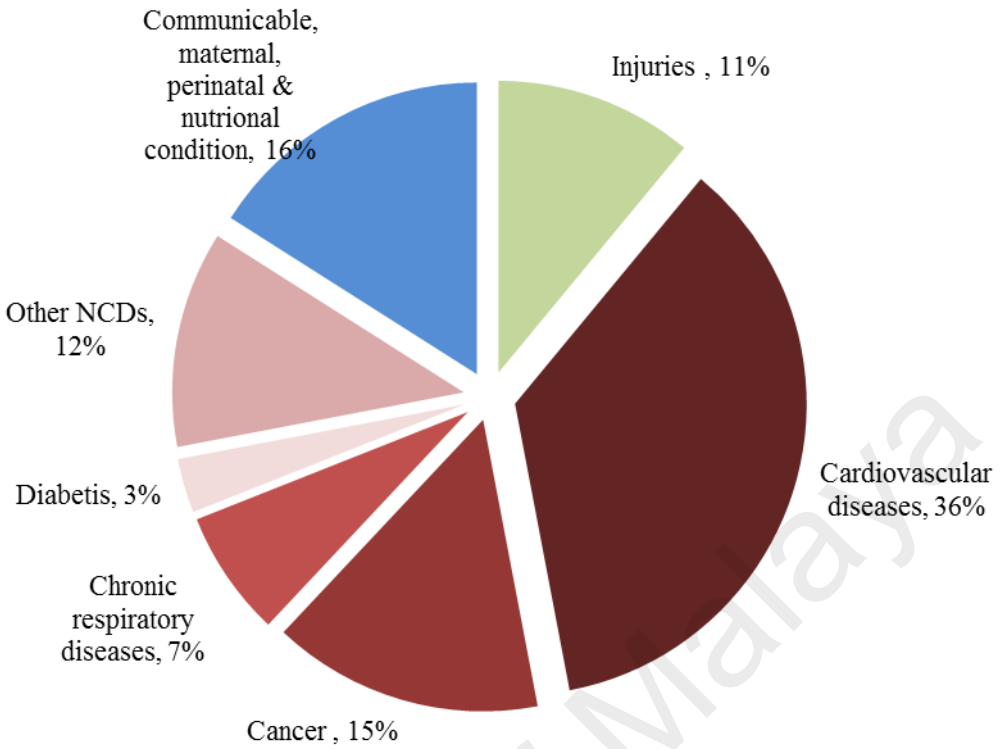


Figure 4.1: Proportional mortality -% of total death, all ages, and both sexes (World Health Organisation, 2014)

According to the World Health Organisation, cardiovascular diseases appeared to be the main cause of death (Figure 4.1) and it contributed to 24.38 per cent of deaths in MOH hospitals in 2014 (Ministry of Health, 2014a). Hypertension and hypercholesterolemia are two major risk factors for cardiovascular diseases and delayed detection and treatment of hypertension disorder and hypercholesterolemia increases the risk of cardiovascular events. The prevalence of hypertension among the Malaysian population was shown to slightly increase from 32.2 per cent in 2006 to 32.7 per cent in 2011. Although the rise was only 1.6 per cent, but major proportion of the hypertensive cases are the undiagnosed which is estimated to account for 60.0 per cent. The

prevalence of hypercholesterolemia at the same time almost doubled from 20.7 per cent in 2006 to 32.6 per cent in 2011. The proportion of undiagnosed hypercholesterolemia was even worrying at 75 per cent; which denotes that three out of four adults in Malaysia with high cholesterol level were undiagnosed (Ministry of Health, 2011b).

Meanwhile, the prevalence of diabetes among the Malaysian population has increased by 31 per cent within the period of five years; from 11.6 per cent in 2006 to 15.2 per cent in 2011. This increasing pattern was mainly due to the increase proportion of "undiagnosed diabetes" and was mainly detected in the state of Sabah. In fact, the prevalence for diabetes in East Malaysia (Sarawak, Sabah and WP Labuan) is becoming comparable with several states in Peninsular Malaysia. The increasing numbers of diabetic patients are expected to increase the public healthcare utilisation and expenditure as 80 per cent of diabetic patients currently seek treatment at MOH facilities (Ministry of Health, 2011b).

Chronic respiratory problems such as asthma and injuries are also main contributors for the non-communicable diseases. Overall 6.4 per cent of the Malaysian population were diagnosed by their doctor or medical personnel that they had asthma with the highest prevalence occurring among those above 75 years old. Childhood asthma was next highest (age between 5 to 9 years old). The prevalence of injuries was also noted to increase over time. 29.5 per cent of the population had sustained some injuries in 1996 and this number was noted to increase to 33.1 per cent by 2011. (Table 18.1)

Table 18.1: Comparison prevalence of illness from previos NHMS survey (Ministry of Health, 2011a)

	NHMS (II) (%)	**NHMS (III) (%)**	**NHMS (IV) (%)**
Asthma	4.2 (3.9 - 4.4)	4.5 (4.3 - 4.8)	6.4 (5.9 - 6.8)
Overall illness/injury	29.5 (28.8 - 30.3)	23.6 (22.9 - 24.3)	33.1 (32.0 - 34.4)

Although the life expectancy in Malaysia had increased over time, the burden of disease is high especially the non-communicable diseases are also increasing at the same. The NHMS (IV) has shown that one out of three individuals' reports experiencing health problem in the past two weeks, and more than 25 per cent claimed that their illness affected their daily activities. It also revealed that, the occurrence of illness is higher among the Bumiputras in Sabah. However the Chinese ethnic group have the lowest burden of illness. The differences in burden of illness were also observed among the different sex group, urban and rural strata as well as between the states. However, there were no differences between income group and occupation (Ministry of Health, 2011b). All of these features will have implications on the healthcare utilisation pattern and economic productivity.

3.4 The pattern of healthcare utilisation in Malaysia

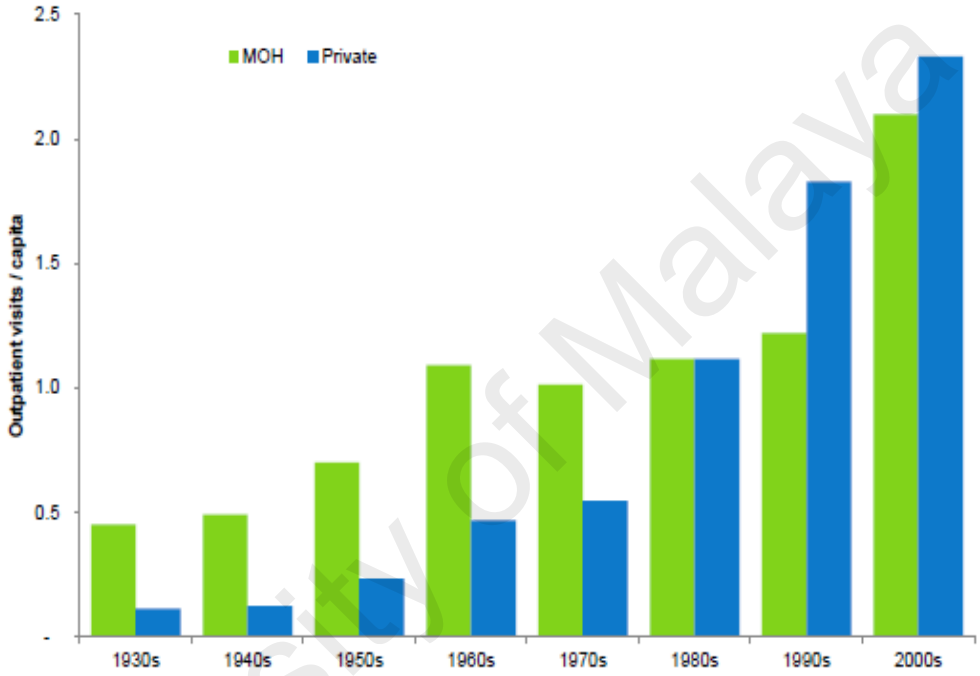
To deliver a need-based healthcare service for the population poses a great challenge for the policy makers especially in view of limited resources, change in demographic pattern and disease burden. The factors that influence the healthcare utilisation as mentioned earlier are numerous. They can either be from the healthcare system termed supply factors or from the characteristics of individual/patient or known as the demand factors.

Improvement in the Malaysian socioeconomic status, expansion of health services and vast economic growth over the years, has shown to increase the life expectancy of the population, increasing aging population and hence higher demand and expectation for healthcare. This has changed the pattern of Malaysian healthcare utilisation. Therefore, the public health system especially, must always keep updated with the relevant information on the utilisation for different health services as to guide in making the right decision from time to time.

Data on health system utilisation for Malaysia are generally collected from several important agencies namely MOH official statistics and NHMS which is collected at every five years for both out-patient and in-patient care information. Although data on out-patient consultation in Malaysia are restricted to the public sector, the MOH official statistics on utilisation of public facilities are considered reliable. Therefore, it is feasible to produce approximations of the overall rates of the use of public and private facilities using the ratio of public to private visit information collected in the NHMS.

This approach of estimation has commonly been used by many OECD countries as well as in Asia-Pacific economies countries (OECD, 2010) to estimates the number for healthcare utilisation.

3.4.1 Out-patient utilisation



Note: Private out-patient refers to out-patient visits to all qualified private providers, including both hospitals and clinics.

Figure 5.1: Estimated out-patient visits to physicians per capita per annum, Malaysia 1930s–2000s (Ministry of Health, 2013b)

Figure 5.1 shows the estimates of the change in out-patient utilisation rates for the past eighty years. This figure suggested that the number or volume of healthcare utilisation has steadily increased from 1930s to 2000s. The overall out-patient utilisation has shown to steadily increased from less than one out-patient consultation per capita per annum in 1930s, to more than 4 out-patient

consultations per capita per annum by the year of 2000s. The 30 years period from 1930s to 1960s, was a significant period for Malaysia healthcare system as the total for out-patient care utilisation had increased, driven by the expansion of the private healthcare utilisation. Nevertheless, the utilisation of public health services were noted to increased faster than the utilisation of private healthcare services in the 2000s (Ministry of Health, 2013b).

The overall level for out-patient care in Malaysia as of 2011 was estimated at 4.3 consultations with physician per capita per annum and these are comparable with the lower end of the range of levels seen in OECD economies, and about average for countries in Asia-Pacific region with available estimates. Comparisons with other regional economies and OECD averages are shown in Figure 6.1 and Figure 7.1. The out-patient utilisation is almost equally divided between the public and private sector. The NHMS 2011 data findings show that fifty per cent of out-patient medical visits (excluding dental and pharmacy visits) were in the public sector, while the rest were in the private sector (Ministry of Health, 2013b).

Meanwhile, the distribution of out-patient care according to type of facilities (public and private), by socioeconomic status (SES) revealed that the utilisation pattern is pro-poor for the public facilities (Table 19.1) and pro-rich for the private facilities (Table 20.1). The poorest 50 per cent of the population prefer to utilise the public facilities, which account for almost two third of total public facilities utilisation while the rich 50 per cent of the population prefer to utilise the private facilities that accounted for two thirds of the total

private facilities utilisation. This pattern was generally similar throughout the period from 1986 to 2011.

Table 19.1: Distribution of out-patient care to public healthcare facilities by SES quintile (%), DEPS 1974 and NHMS 1986-2011 (Ministry of Health, 2013b)

Survey Year	Quintile					CI
	Poorest 20%	Q2	Q3	Q4	Richest 20%	
1974	24.4	22.9	20.9	18.9	12.9	-0.108***
1986	22.0	22.0	21.2	21.2	13.7	-0.073***
1996	28.9	27.3	19.4	14.6	9.8	-0.213***
2006	29.4	24.7	20.4	15.0	10.5	-0.195***
2011	22.8	30.0	23.7	15.1	8.5	-0.179***

Notes: (a) Significance of difference indicated by *0.05 ≤ p <0.05, *** p < 0.01

Table 20.1: Distribution of out-patient care to private healthcare facilities by SES quintile (%), DEPS 1974 and NHMS 1986-2011 (Ministry of Health, 2013b)

Survey Year	Quintile					CI
	Poorest 20%	Q2	Q3	Q4	Richest 20%	
1974	6.1	16.4	20.0	27.1	30.4	-0.237***
1986	9.8	13.3	17.9	23.0	36.0	-0.263***
1996	10.5	16.3	19.2	26.0	27.9	-0.190***
2006	13.5	16.7	19.2	25.5	25.1	-0.133***
2011	9.8	15.3	19.2	28.8	27.0	-0.195***

Notes: (a) Significance of difference indicated by *0.05 ≤ p <0.05, *** p < 0.01

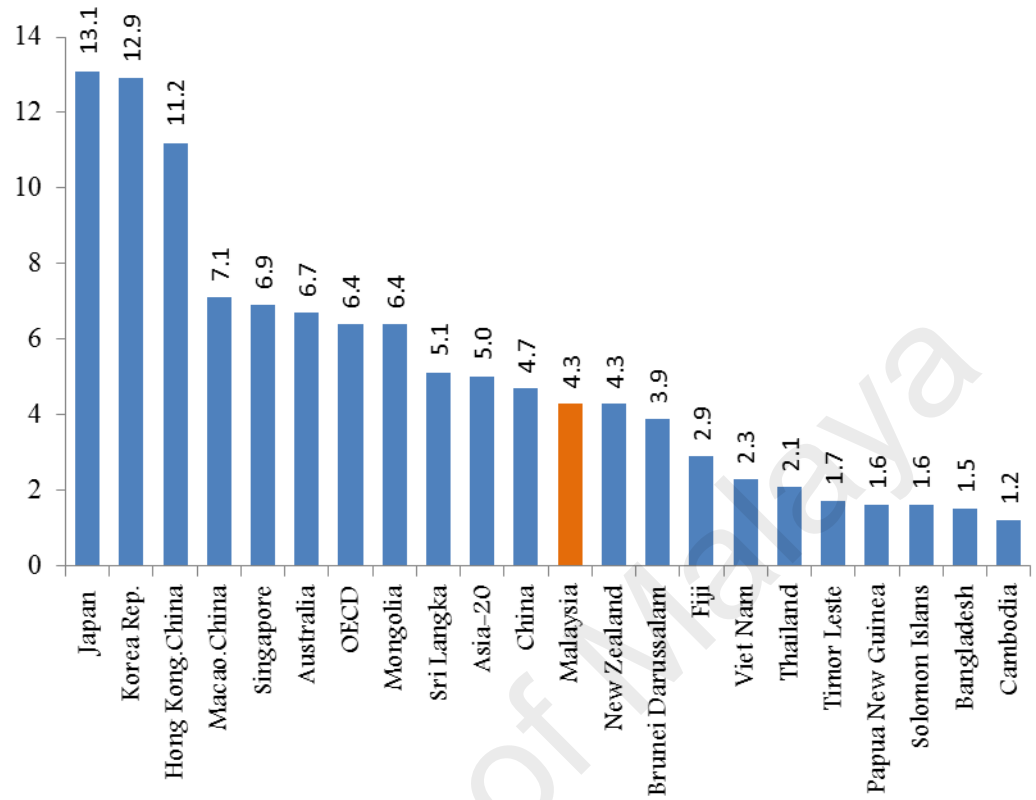


Figure 6.1: Out-patient visit to physician percapita per annum, Malaysia compared with other Asian-Pacific and OECD countries, 2011.(Ministry of Health, 2013b)

3.4.2 In-patient utilisation

For in-patient care, the overall levels of healthcare utilisation in Malaysia as of 2011 was estimated at 111 in-patient discharge per 1,000 capita per annum (Ministry of Health, 2013b). This number was again comparable with other Asian countries and OECD. Unlike the out-patient care, the in-patient care was largely dominated by the public sector and it was estimated that 74 per cent of the total admission occurs in public sector according to the NHMS 2011 data.

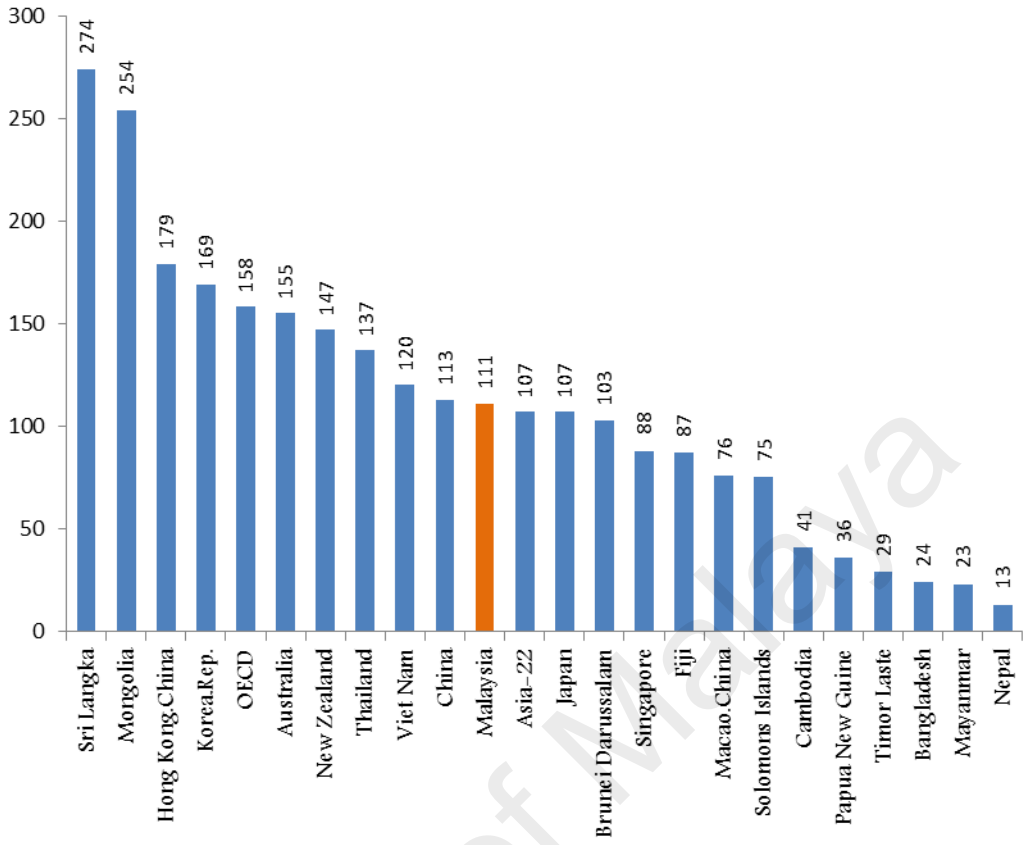


Figure 7.1: In-patient discharge per 1,000 capita per annum, Malaysia compared with other Asian/Pacific and OECD countries.(Ministry of Health, 2013b)

The distribution of in-patient care according to type of facilities (public and private), and by socioeconomic status (SES) show that the utilisation of public healthcare facilities was pro-poor in Malaysia (Table 21.1). At the same time, it was noted to be pro-rich for private healthcare facilities utilisation (Table 22.1). Similar to the out-patient care, the same pattern was observed for the in-patient care as observed between the years of 1986-2011. The information obtained from NHMS shows that these patterns remain unchanged over time.

Table 21.1: Distribution of in-patient days care to public healthcare facilities by SES quintile (%), DEPS 1974 and NHMS 1986-2011 (Ministry of Health, 2013b)

Survey Year	Quintile					CI
	Poorest 20%	Q2	Q3	Q4	Richest 20%	
1974	18.9	27.4	10.3	23.7	19.7	-0.008
1986	23.9	24.9	10.9	27.9	12.5	-0.112**
1996	24.9	22.0	20.1	19.6	13.5	-0.120***
2006	24.8	23.4	20.6	19.4	11.8	-0.124***
2011	22.8	27.5	16.3	25.1	8.3	-0.150***

Note: (a) Significance of difference indicated by *0.05 ≤ p <0.01, ** p < 0.05, ***p <0.01

Table 22.1: Distribution of in-patient days care to private healthcare facilities by SES quintile (%), DEPS 1974 and NHMS 1986-2011 (Ministry of Health, 2013b)

Survey Year	Quintile					CI
	Poorest 20%	Q2	Q3	Q4	Richest 20%	
1974	1.5	0.0	20.0	66.2	12.3	0.350
1986	14.5	3.9	1.9	16.6	63.1	0.518*
1996	11.4	10.4	14.4	21.6	42.3	0.312***
2006	4.3	9.9	10.2	23.9	51.7	0.461***
2011	4.1	12.5	14.4	34.3	34.7	0.354***

Note: (a) Significance of difference indicated by *0.05 ≤ p <0.01, **0.01≤ p < 0.05, ***p<0.01

Overall, the utilisation pattern for healthcare services in Malaysia shows that the disadvantaged group or poorer population, tend to utilise public out-patient and in-patient care services. Meanwhile, the middle income group used the public and private healthcare facilities almost equally for the out-patient care but still mainly depend on public healthcare facilities when it comes to in-

patient care. On the other hand, the well-off or richer populations prefer to utilise the private healthcare facilities for both out-patient as well as the in-patient care (Ministry of Health, 2013b). The fact that public services in Malaysia was predominantly utilised by the poorer segment of the population is commendable in comparison to other regional countries. However, the pro-rich utilisation pattern for private healthcare services is similar to the experience of other countries (Ministry of Health, 2013b).

The comparison in terms of the disparities for public and private out-patient utilisation between the richest and poorest quintiles in Malaysia with other regional countries shows that the utilisation for the public out-patient care services has become more pro-poor over time. In fact Malaysia was rank second after the Hong Kong for being most pro-poor in the region (Figure 8.1). Meanwhile, for private care utilisation, the findings of disparities are comparable to those found in other countries. For the in-patient care services, the utilisation of public in-patient care was again noted to be pro-poor following closely after Hong Kong (Figure 9.1).

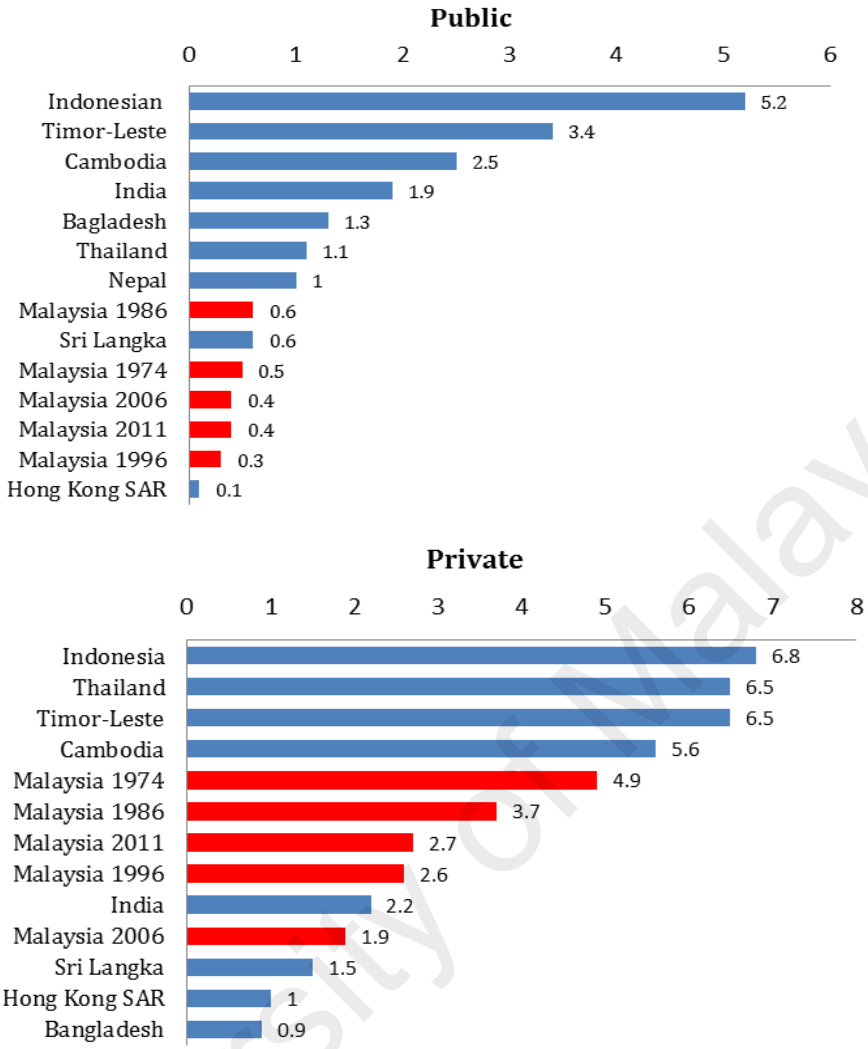


Figure 8.1: Inequalities in utilisation of public and private out-patient care-ratio of utilisation by richest to poorest quitile, Malaysia and regional economies. (Ministry of Health, 2013b)

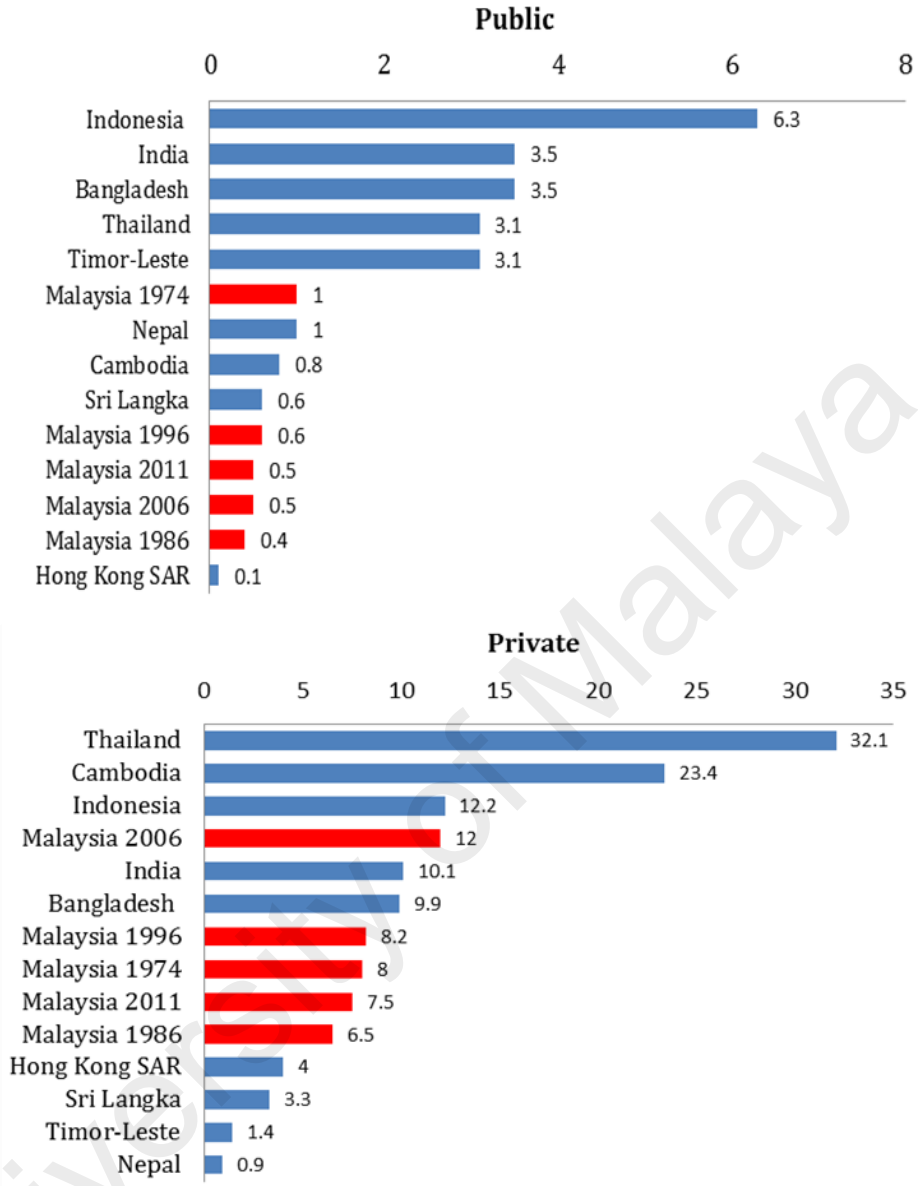


Figure 9.1: Inequalities in utilisation of public and private in-patient care - ratio of utilisation by richest to poorest quintiles, Malaysia and regional economies.(Ministry of Health, 2013b)

3.5 Summary

In general, Malaysia has managed to provide a high level of availability of public healthcare services, within a well distributed healthcare delivery system. A major portion of the health services delivered consisted of highly subsidised public facilities. The development and expansion of healthcare services progressed through three important phases, aiming to provide wide geographical distribution and accessibility at low cost of comprehensive healthcare for ALL in the country. The first stage of healthcare development for Malaysia was during the colonial days of the British government in the early nineteenth century. The formation of the core structure for the Malaysian healthcare system today was a result from British reaction to safeguard their colonial interest. Nonetheless, several Health Acts that were enacted together with an establishment of several important health facilities during that time, has undeniably laid a significant foundation for the current Malaysian health system.

Meanwhile, the second phase for the healthcare development occurs after Independence. The ruling government extended the healthcare services to the population especially to the rural constituents in order to improve the population's health status and solidify their power. A rapid growth of the country's economy after independence expands the tax base thus permitting the government to allocate greater resources to the health sector without compromising investment in other higher priority areas. This resulted in significant expansion of healthcare distribution throughout the country, even in the sparsely populated and poorer states of Sarawak and Sabah.

Third phase of healthcare development occurred after 1980. It was aimed to reduce the role of the government in the economic development and the main motivation of these changes was an overall reorientation of the government's models of economic development. The government attempted to limit the federation's role as the provider of basic welfare services and tried to increase the responsibilities of families, communities and private sector. Although the cost of Malaysia's public health services was modest compared to internationals standards, government officials argued that annual increases in the healthcare budget were unsustainable in the long run.

As of today, the Malaysian healthcare system is still fundamentally public oriented, less costly and more effective than most countries at the same level of income (Leng, 2007). The burden of catastrophic spending for household is lower in Malaysia compared to other countries in Asia, such as in Hong Kong, South Korea which concentrated mainly on the rich than the poor (Ng, 2012). There is adequate evidence to show that the Malaysians are not burdened when making payment to utilise the healthcare, but the overall picture on UHC in Malaysia is still unclear until the delivery component of the health system especially on the utilisation of the services is assessed. The major economic achievement since independence has inevitably changed the landscape of the Malaysian health system, particularly on the role of private sector and the burden of diseases. The combination for both factors has influenced the pattern for the healthcare utilisation, particularly from the perspective of equity.

CHAPTER 4: DATA AND MEASUREMENT

4.1 Introduction

The assessment of fairness in healthcare utilisation is achieved by using data from the NHMS conducted by MOH in 1996, 2006 and 2011. The main objective of the NHMS was to obtain community-based information for the MOH to review the health priorities, programme strategies as well as for planning and resources allocation. The NHMS had been carried out by MOH since 1986, but only three data sets were used for this analysis. Even though the states of Sabah and Sarawak (East Malaysia) were not included during the first round survey (NHMS I-year 1986), the important reasons why the three data sets NHMS (II), (III) and (IV) was chosen is due to the fact that it was an important period which there was private healthcare development and there was significant economic progression in 1996 to 2011. Analysing the changes across three different points in time basically requires all the three data sets to be comparable especially with reference to all the variables to be used for the analysis.

This chapter begins in section 4.2 with the description of NHMS and subsequently identifies the similarities in the three data sets obtained from these surveys which allow for valid comparison of the data analysis to be made across three different years namely 1996, 2006 and 2011. Section 4.5 focuses on measurement of fairness in healthcare utilisation and finally concludes in section 4.7 which summarises all the important data issues for this analysis.

4.2 Data

4.2.1 National Health and Morbidity Survey

The first NHMS was conducted in 1986 by MOH. It was done in collaboration with the Department of Statistic and has been regularly conducted since then at interval of ten years until 2006. Now it is expected to be conducted every five years. This health survey obtained its information through face-to face interview at the household level using the questionnaires prepared and validated by MOH. This survey used sampling procedures developed by the Department of Statistics. A two-stage stratified random sampling method was adopted. This two-stage stratified sampling design had two levels of stratification where the primary stratum comprised the 13 states and three Federal Territories in Malaysia and the second stratum contained the urban and rural areas within the primary stratum. Samples were drawn independently within each level of the secondary stratum. In the first stage, clusters of household or Enumeration Blocks (EBs), were selected randomly from each secondary stratum and in the second stage, Living Quarters (LQs) were sampled randomly within each EBs. All households within the selected LQ were included in the survey.

The sampling frame of EBs used was that developed for the Labor Force Survey (1995) produced by the Statistics Department of each state. Each EB is a geographically contiguous area with identifiable boundaries and each contained between 80 and 120 LQs and about 600 persons. The EBs was classified into urban and rural areas based on population cuts-offs. Urban areas were gazetted areas with their adjoining built-up area which had a combined

population of 10,000 or more at the time of the preceding census. Rural areas are areas with less than 10,000 populations. The LQs was identified as an isolated structure or any independent attachment which had been built as or transformed to, quarters intentional for living purposes and each LQ may comprise one or more households. Meanwhile the household is identified as "organisation made by persons individually or in a group, for food and other prerequisites for living within the same LQ."

The information collected by NHMS every ten years, served as important information for MOH to develop health policies. The information collected basically focussed on the load of illnesses, disabilities among the population and health seeking behaviour pattern, based on several criteria such as the prevalence of illness, diseases that were associated with changes in lifestyle, demographic and environmental issues that had high economic influence. Any other information that was relevant, but could not be obtained through routine data collection was also collected during this survey. The sample size of NHMS took into account characteristics of the population as well as the survey objectives such as: (i) expected prevalence of the illness or condition to be surveyed, (ii) expected utilisation of the data and (iii) availability of the resources especially human resource, financial and time feasibility of the survey. The NHMS was carried out over a period of 12 months to capture the seasonal variations in consumption. The EBs selected for each survey was distributed systematically and equally into 12 monthly survey period.

4.3 Comparison of NHMS data sets

This study aims to assess the fairness in healthcare utilisation using the data set of the NHMS collected in 1996, 2006 and 2011. This section compare the data similarities and differences across all the data sets used, hence highlighting the important comparable features across the three data sets, especially with reference to all the variables to be used for the analysis. The assessment includes assessing the data sets from the perspective of (a) amount and quality of information in each data set (b) the response rate, (c) reference and recall period and (d) handling of missing values.

4.3.1 Quality and amount of information

In general, all the three data sets have been collected by different groups of researchers, using different sets of questionnaire, involving different households in each round of survey and at different times. Therefore, the content and quality aspects for each data are expected to be different in certain aspects. Furthermore, in addition to the routine health-related information that had always been collected in every survey some data sets contain additional information on specific health issues compared to other data sets, depending on MOH specific interest during each survey. Nevertheless, the main objectives have not changed over the years, suggesting that major proportion of health-related information to a certain extent can be expected to still remain the same or will be available in all the data sets. The most health related variables and information was collected in NHMS (III) data sets. This is shown by the number of health modules covered in NHMS (III) compared to NHMS (II) and (IV) (Table 23.1).

Table 23.1: Comparison of the modules in NHMS II,III and IV data sets

	NHMS (II)-1996	NHMS (III) -2006	NHMS (IV)-2011
1.	Module A Demographic and socioeconomic status	Module A1: Household questionnaire	Module A1: Household questionnaire
2.		Module A2: Sociodemographic	Module A2: Sociodemographic
3.	Module B B1: Illness & Treatment B2:Illness and no treatment B3: No illness and get treatment Module D Dentures, spectacle and etc.	Module B a. Health Expenditure b. Hospitalisation c. Private Healthcare Insurance	Module B1 Load of illness Module B5 Healthcare cost appliances
4.		Module C Oral Health	Module B3 Dental or oral health
5.	Module C Hospitalisation Module L Acute respiratory illness	Module D a. Load of illness b. Health services utilisation	Module B2 Health services utilisation Module B4 Out services utilisation
6.	Module E Injuries	Module E Injury and risk reduction	Module H Home injury

Continue from Table 23.1

	NHMS (II)-1996	NHMS (III)-2006	NHMS (IV)-2011
7.	Module K Disabilities	Module F a. Physical disability b. Activity of daily living c. Rehabilitation	
8.	Module F Asthma	Module G a. Asthma (Adult) b. Asthma (Child)	Module B7 Health problem
9.		Module H Child health home base card	
10.		Module I Dengue	Module B7 Health problem
11.	Module J Cancer	Module J General Health Information	Module B8 General Health
12.		Module K Nutritional Labelling	
13.		Module L Medication Labelling	
14.		Module M Organ Donation	
15.	Module Exercise/BMI	Module N Physical activities	Module D Physical activities Module K Clinical Assessment
16.	Module H Smoking Module I Alcohol	Module O Tobacco and Alcohol consumption	ModuleB9 Personal risk factor

Continue from Table 23.1

	NHMS (II)-1996	NHMS (III) -2006	NHMS (IV)-2011
17.	Module O Chest pain	Module P Ischaemic heart disease	Module B7 Health problem
18.	Module P Diabetis mellitus	Module Q Hypercholesterolemia	Module F Hypercholesterolemia Module K Clinical Assessment
19.	Module P Diabetis mellitus	Module R Diabetis Mellitus	Module E Diabetis Mellitus
20.	Module N Hypertension	Module S Hypertension	Module G Hypertension
21.	Module M Breastfeeding and weaning	Module T Infant Feeding Practice	
22.		Module U Nutritional Status	Module C Dietary practice
23.	Module Q Breast examination	Module V1 Women's Health	
24.	Module R Pap smear	Module V2 Pap Smear	
25.	Module H Smoking	Module W Tobacco consumption	
26.	Module I Alcohol	Module X Alcohol consumption	
27.		Module Y Sexual behaviour	
28.	Module S1 ModuleS2	Module Z Psychiatric Morbidity	Module J Mental Health-adult

Table 23.1 shows all the modules that are available in NHMS (II), (III) and (IV) data sets. Some modules were found in all the data sets while some others, were specifically available in one data set only. The information on demographic, socioeconomic and health-related modules pertaining to hypertension, diabetes, asthma and injuries were available in all the data sets. Questions used to collect the information for those modules were similar in all the data sets. It can therefore be argued that the information collected is similar or comparable.

On the other hand, several other modules such as those related to health services utilisation (in-patient and out-patient care) were noted to have some variation. The variations were mainly due to the questionnaire design that led to variation in the scope of information collected from the survey. For example NHMS (II) provided three separate columns for private, public and university hospitals care information while for NHMS (III) only provided one column to be filled. The additional information obtained in NHMS (II) due to the questionnaire has indirectly encouraged the respondent to give more than one answer in comparison to NHMS (III) which only obtained single information. Improvement was then made in NHMS (IV) as the questionnaires not only provide three columns for information, but were more flexible for either private or public option in each column. Similar features were also noted for out-patient care services. Despite these variations, the data on health services utilisation from NHMS data can still be considered as reliable source of information. This is because the cross-checking with MOH official data revealed that the out-patient visits are only over-reported by 3 per cent while

the in-patient admission is under-reported by 24 per cent. This degree of misreporting in general is quite consistent with long-standing finding in the survey research literature (C. Cannell, & Fowler, F., 1965; C. Cannell, Fisher, G., & Bakker, T. , 1965).

4.3.2 Response rate and data features

The response rate for NHMS (II) in 1996 was reported to be 86.9 per cent (Ministry of Health, 1998), 90 per cent for NHMS (III), in 2006 (Ministry of Health, 2006) and 88.2 per cent for NHMS (IV) in 2011 (Ministry of Health, 2011c). As described earlier, all the three NHMS data sets used a stratified two-stage sampling design in order to provide nationally representative estimates of risks, morbidities and healthcare utilisation pattern for both our-patient and in-patient care. The stratified random sampling method used in NHMS data collection reduced the chance that some population groups will be omitted. It will also ensure that every targeted subpopulation group was represented. Another advantage of using the probabilistic sampling method is the fact that the sampling error can be determined and expressed as either margin of error or confidence interval.

However, probabilistic sampling method does have its own limitation that can occur during the sampling process namely the non-response bias. This potential bias can occur when the selected household or individual refuses to participate in the survey. Secondly there is potential for coverage bias as some members of the population may be overlooked or not covered during the survey. It can also happen when a certain population is purposely not captured

because of its minority status which is not representative of the overall population scenario. This is due to logistic issues such as accessibility in reaching out to them. The NHMS data set was adjusted for the non-response rate and weight distribution was made for every state and by urban and rural areas. The sample size for NHMS data were predetermined by characteristics of the targeted population as well as the survey objectives which was the expected prevalence of the illness or condition that will be surveyed, expected utilisation of data and the availability of the resources. The sums of the samples weight provide unbiased estimation of the total individual number of the surveyed population. The sampling weight was used to rectify several problems which resulted in non-representativeness of the data set. In order to make the analysis comparable across all the three data sets, the adjusted weight provided in each NHMS data sets were used taking into account the complex survey design of the NHMS.

Table 24.1: Distribution of respondent by states for NHMS (II), (III) and (IV) data sets (Ministry of Health, 1997, 2006, 2011a)

State	No of respondent (%)					
	(1996)		(2006)		(2011)	
Johor	4,860	**(8.1)**	6,278	**(11.1)**	2,471	**(8.6)**
Kedah	2,980	**(5.0)**	4,232	**(7.5)**	1,716	**(6.0)**
Kelantan	3,462	**(5.8)**	3,804	**(6.7)**	1,896	**(6.6)**
Melaka	2,500	**(4.2)**	1,389	**(2.4)**	1,599	**(5.6)**
Negeri Sembilan	2,412	**(4.0)**	2,072	**(3.7)**	1,529	**(5.3)**
Pahang	2,796	**(4.7)**	2,969	**(5.2)**	1,675	**(5.8)**
Pulau Pinang	2,973	**(5.0)**	3,067	**(5.4)**	1,801	**(6.3)**
Perak	4,460	**(7.4)**	4,257	**(7.5)**	1,604	**(5.6)**
Perlis	2,226	**(3.7)**	517	**(0.9)**	1,426	**(5.0)**
Selangor	6,923	**(11.6)**	9,487	**(16.7)**	4,182	**(14.6)**
Terengganu	2,707	**(4.5)**	2,537	**(4.5)**	1,864	**(6.5)**
Sabah & W.P Labuan	9,497	**(15.9)**	8,173	**(14.4)**	3,185	**(11.1)**
Sarawak	9,230	**(15.4)**	4,966	**(8.8)**	1,970	**(6.9)**
W.P KualaLumpur	2,877	**(4.8)**	2,962	**(5.2)**	1,732	**(6.0)**
Total	**59,903**	**(100)**	**56,710**	**(100)**	**28,650**	**(100)**

4.3.3 Reference and recall period

The reference period for all the healthcare utilisation was one year and this is to permit the estimation for the healthcare utilisation to be standardised for a period of one year. Two recall periods were used to obtain the information on healthcare utilisation; two weeks for the out-patient care and one year for the in-patient care. Each of the NHMS survey was carried during different over periods of time in 1996, 2006 and 2011. The NHMS (II) were carried out simultaneously throughout Malaysia from 1st April 1996 to 10th July 1997 (Ministry of Health, 1998), while NHMS (III) data collection was conducted from April to end of July 2006 (Ministry of Health, 2006). The NHMS (IV) started on 17th April 2011 and completed on 27th July 2011, while in Sabah and Sarawak the data collection started in early May 2011 so as to avoid the general election in Sarawak during the third week of April (Ministry of Health, 2011c).

There were no differences in a recall period in both the in-patient as well as for the out-patient care for the healthcare utilisation. It is important to note that the differences in the recall period may affect the accuracy of healthcare utilisation estimates. The episodes of in-patient care in the hospital typically occur infrequently and have higher irregular occurrences as compared to episodes of out-patient care. In a 1996 study, it was reported that only seven per cent of the Malaysian population had experienced in-patient hospital care in the one year prior to the survey as compared to 16 per cent of the population who had at least one episode of out-patient care within two weeks before the survey. Due to expected frequency of utilisation, it is therefore normal practice

for health survey to use a short two week or one month recall period for out-patient care and one year recall period for in-patient hospital care. The NHMS (II), (III) and (IV), had also used the two-weeks recall period for out-patient care and one year recall period for in-patient care

Table 25.1: Comparison of the recall period of the healthcare utilisation in NHMS 1996, 2006 and 2011 (Ministry of Health, 1997, 2006, 2011a)

Healthcare Utilisation	Recall period		
	1996	**2006**	**2011**
Out-patient care	Two weeks	Two weeks	Two weeks
In-patient care	One year	One year	12 Months

4.3.4 Managing missing values

Another important indicator of the quality of the data sets used is the presence of missing values. Numbers of missing values were observed in several variables of the NHMS data sets including income, age, sex, and employment status. The patterns of distribution for missing values were assessed and each pattern of the missing value was shown to have specific features and therefore subjected to different techniques of managing missing data. Two techniques were used to clean the missing values which are imputation and deletion, depending on its features. Any variables that appear to be randomly missing and occur less than five per cent were deleted, while variables that were missing not at random and more than five per cent, were imputed accordingly.

One of the most important variables that required imputation was the income. Since income was used as a measure of the living standard, the cleaning process for the income variable was cautiously done to ensure that the original features of the data sets was preserved or maintained. For example, in the first data set NHMS (II)-1996, 36,583 out of 59,903 individuals did not report their income. Out of these 36,583 individuals, 25,567 (69.9%) individuals were actually those who were below 18 years old. A total of 10,535 (28.8%) individuals were those who are above 17 years but reported their employment status, while the remaining 481 individuals (1.3%) did not reporting their income and their employment status.

Hence, imputations for the missing values were done accordingly. Firstly, zero value was assigned to the missing value of income to those who were below 18 years. This was based on the understanding that those who were 18 years old and below, were most likely school children and therefore not expected to have income that will contribute to the total household income. Secondly, cleaning the missing value for income that had information on their employment status was done differently. The mean income for every group of the employment categories was first obtained. This information was then used to impute the data, by assigning the mean value obtained, to the missing value, according to their employment status. Lastly, missing value for income with no information on the employment status was imputed by assigning a zero value. This was done because there were no specific references to impute the data and the number was small (1.3%) and not expected to affect the overall data features particularly on income. This approach was similarly applied to

income variable in NHMS (III) data set (Table 26.1).The income variable in NHMS (IV) data sets was found complete; no data cleaning was therefore needed.

Table 26.1: Distribution of missing values by income for NHMS data set

	NHMS (II)	**NHMS (III)**	**NHMS (IV)**
Reported income	23,320	21,613	28,650
Total Missing value	36,583	35,097	NM
Missing value, <18 years old (assume school children)	25,567 (69.9%)	21,770 (62.0%)	NM
Missing value >17 years old (Have employment status)	10,535 (28.8%)	12,851 (36.6%)	NM
Missing value >17 years old (No employment status)	481 (1.3%)	471 (1.3%)	NM
Total individual	59,903	56,710	28,650

Note; NM: No Missing value
Value values in the brackets denote percentage of missing value from the total number of missing value

After cleaning the income variable, missing value for other variables such as age, sex, and employment status was then assessed and managed accordingly. Two main features for each variable were examined before cleaning the data. Those features included the distribution pattern and percentage of the missing value. Table 27.1 to Table 29.1 shows the distribution of missing value for

sex, employment status and age by income quintile, strata and region for 1996, 2006 and 2011 data sets.

Table 27.1: Distribution of missing value for sex variable by income quintile, strata and regional

Sex							
		Poorest	2nd	Middle	4th	Richest	Total
Income Quintile	1996	99	91	89	110	88	477
	2006	-	-	-	-	-	-
	2011	-	-	-	-	-	-
		Urban			Rural		Total
Urban/ Rural	1996	266			211		477
	2006	-			-		-
	2011	-			-		-
		Peninsular			East Malaysia		Total
Peninsular/ East Malaysia	1996	350			127		477
	2006	-			-		-
	2011	-			-		-

Table 28.1: Distibution of missing value for employment status variable by income quintile, strata and regional

Employment Status							
		Poorest	2nd	Middle	4th	Richest	Total
Income Quintile	1996	201	107	87	71	35	501
	2006	172	96	102	101	89	560
	2011	-	-	-	-	-	-
			Urban		Rural		Total
Urban/ Rural	1996		284		277		501
	2006		294		266		560
	2011		-		-		-
			Peninsular		East Malaysia		Total
Peninsular/ East Malaysia	1996		306		195		501
	2006		440		120		560
	2011		-		-		-

Table 29.1: Distribution of missing value for age variable by income quintile, strata and regional

Age							
		Poorest	2nd	Middle	4th	Richest	Total
Income Quintile	1996	275	164	157	134	90	820
	2006	-	-	-	-	-	-
	2011	-	-	-	-	-	-
			Urban		Rural		Total
Urban/ Rural	1996		433		387		820
	2006		-		-		-
	2011		-		-		-
			Peninsular		East Malaysia		Total
Peninsular/ East Malaysia	1996		502		318		820
	2006		-		-		-
	2011		-		-		-

The distributions of the missing values for age, sex and employment status appear at random. This is based on the finding that the missing values of age, sex and employment status were well distributed by all the important attributes namely income, strata and regional. The percentage of missing values was also found to be less than five per cent. Therefore, based on these two features, the respondent with missing values for age, sex and employment status was then deleted from the data sets. In principle this will not alter the original feature of the data set. In general, the data sets have been managed accordingly. Both of the techniques adopted to clean the data sets ensured that the missing value in each data was managed in such manner that will preserve the originality of the data set.

4.4 Definition of variables use

Section 4.3 highlighted the similarities and differences across the three data sets used in this study. Although NHMS (III) has a longer list of health-related modules than NHMS (II) and NHMS (IV), however the important variables required for the analysis are available and comparable with the previous two data sets used. The variables used for this analysis can be grouped into four main domains which are (a) socio-demographic (b) economic status (c) health status and (d) health services utilisation. The domain of socio-demographic characteristic is presented by variables such as age, sex, citizenship, and ethnicity as shown in Table 30.1.

Table 30.1: Domain of socio-dermographic characteristic

Variables	**NHMS (II)**	**NHMS (III)**	**NHMS (IV)**
Strata	(strata)	(strata)	(strata)
State	(state)	(state)	(state)
Age	(date of survey) (date of birth)	(ageori)	(age)
Sex	(AS7)	(gender)	(gender)
Citizenship	(AS6A)	(citizen)	(a2120)
Ethnicity	(AS4A)	(race2)	(a2130)

The domain of economic status is presented by variables such as income and employment status (Table 31.1) and domain of health status is presented by variables such as hypertension, diabetes, asthma, acute illness/injuries and others (Table 32.1).

Table 31.1: Dormain of economic status

Variables	NHMS (II)	NHMS (III)	NHMS (IV)
Income	AS15A	J08_average_income	A2220,a2221,a2222
Employment Status	(AS10A)	(J18_job_code)	(a2210)

Table 32.1: Domain of health status

Variables	NHMS (II)	NHMS (III)	NHMS (IV)
Hypertension	(NS2)	(J29_known_diabet)	(g020)
Cholesterol level	(chsterol)	(J28_chol_level)	(cleaned_chol_reading)
Diabetis mellitus	(PS2)	(J29_known_diabet)	(e020)
Kidney problem	(PS107)	(J08_kidneyfailure)	(b7008)
Asthma Status	(FS2)	(J19_asthma)	(b7002)
Absent from work/school	(FS5A)	(J20_miss)	(b1100)
Acute illness/injury	(BS2)	(J09_s11)	(b1017)

Under health status domain (Table 32.1) the health profiles were selected based on the epidemiological pattern of this country (Figure 4.1 & Table 17.1). This is based on the argument that the Malaysian health status should be reflected by epidemiological pattern of this country. In general, the epidemiological pattern for the Malaysian population coincides with the epidemiological pattern found in upper-middle income countries (Figure 4.1 & Table 17.1). In 2012, the number of mortality rates for non-communicable disease in the Malaysia was estimated about five times the rate for communicable disease and 73 per cent of all mortality in Malaysia are caused by the non-communicable diseases (Ministry of Health, 2014a). The top NCDs in Malaysia include ischaemic heart disease, cerebrovascular event, injuries, and mental illnesses. Based on this understanding, three variables which are known established risk factors for NCDs were selected. These variables include the health profile on hypertension, diabetes and cholesterol level. Another important variable was kidney problem which was also selected. This

can be argued that kidney problem is used to indicate the severity of illness especially for individuals with diabetes or hypertension with poor compliance. The variable absent from schools/work is used as a proxy for the mental and social wellbeing (World Health Organisation, 2002). An individual who is considered healthy should be able to attend school or work. The health status domain also included the profiles for asthma and acute/injuries profiles. Beside the risk for NCDs, asthma and acute/injuries also contribute to the epidemiological pattern and health services utilisation in Malaysia.

Table 33.1: Domain of health services utilisation

Variables	**NHMS (II)**	**NHMS (III)**	**NHMS (IV)**
Out-patient care	(B1S3T1,T2,T3) (B1S2T1,T2,T3)	(J02_s2_2) (J02_s2_1_1_1)	(b4304a,b4302b,b4304b,) (b4304c,b4302a, b4302c)
Hospitalisation	(CS21A,CS31A,) CS41A)	(J04_frequency2)	(b2303a, b2303c, 2303b)

Meanwhile for health services utilisation, it was represented by two important variables such as out-patient care and in-patient care utilisation.

Table 34.1: How the utilisation question were framed in each survey

OUT-PATIENT CARE UTILISATION		
1996	**2006**	**2011**
(MODULE B1**)**	(MODULE B1)	(MODULE B4)
S.2 From (date)_till today (past 2 weeks) where did u/_received treatment advice S.3 In the past 2 weeks, how many times did you/_ visit each facility	S2 Option whether have seek health treatment/health care S3 Option for how many times S4 Option for the place of treatment	B4100 In the last 2 weeks till now did u receive any outpatient care? B4301 Name of place B4302 Is..owned by the government or private B4304 How many times did you admitted to
INPATIENT CARE UTILISATION		
1996	**2006**	**2011**
(MODULE C**)**	(MODULE B2)	(MODULE B2)
S.1 From (date)_till this month (past one year), have you/_been admitted to any ward hospitals S.2 (a/b/c) In the past one year, have you/_been admitted to any government/private/ university/ other hospital?	Q13 Option for the admission to hospital in the last one year Q14 How many times were admitted Q16 Place /of admission	B2100 In the last 12 months from …2010 till now, have you ever been admitted to any ward? B2301 Name of place B2302 Is..owned by the government or private B2303 How many times were you admitted to

4.5 Measurement

4.5.1 Theories and Concept

In general, the approach of measuring equity in healthcare utilisation is derived from the concept of measuring "fair distribution" for healthcare utilisation. Sometimes it is also summarised as "a moral evaluation in healthcare utilisation". In principle, this notion is tied to the concept of distributive justice that was previously discussed in section 2.4. Healthcare like other resource is limited therefore it has to be distributed accordingly. On what basis should the healthcare be distributed? Again as discussed in section 2.4 and 2.5, it must be distributed according to the health need. The concept of health need arise from the understanding that an individual's life chance/life plan is impaired by illness. Therefore, healthcare is held responsible to rectify the impairment or any other misdevelopment from illness that deprive the individual talents and skills.

The approach of assessment for fairness in healthcare utilisation is derived based on two important concepts which are horizontal and vertical concept. Horizontal concept describes fairness whenever people of equal need are being treated equally, while the vertical concept describes fairness when people with different health needs use the healthcare services differently. Theoretically, both of these concepts could be applied to measure the fairness in healthcare utilisation, nevertheless the horizontal equity concept is more practical for assessing the utilisation of healthcare. Vertical equity concept is frequently used to illustrate the equity in healthcare finance/payment and to assess how

people with different affordability make the appropriate payment for the healthcare (Starfield, 2011).

Since measuring equity in healthcare utilisation arose from the concept of measuring "fair distribution" for healthcare utilisation, therefore the tool that were used to assess fairness were selected from the distribution tools. Distribution in general refers to the frequency pattern of variable dispersion of population or a sample. It can be assessed by several distribution tools that come from either statistics or economic fields. Tools that are commonly used to measure distribution range from basic distribution tools such as range, average, variance, Population Attributable Risk (PAR) to more complex tools such as Lorenz Curve, Relative Index of Inequality (RII), Atkinson Index (AI), Gini Coefficient, Concentration Curve (***CC***) and Concentration Index (***C***) (Asada, 2005). Although there are many tools available to measure distribution, this study however used three tools which are the Average, CC and Horizontal Inequity Index (HI_{wv}). Specific tools such as CC and HI_{wv} were used based on the argument that these tools are able to address changes in the group size over a period of time and able to make comparison across different living standards (Owen O'Donnell et al., 2007).

C is a derivative of Gini Coefficient which is an established index that is frequently used in the field of economics to measure the inequalities across living standards (Szwarcwald, 2002). The ***C*** is defined mathematically based on CC, plotted the cumulative percentage of the health variables on y-axis against the cumulative percentage of population ranked by their living standards

arranged from the poorest to the richest on the x-axis. (Farris, 2010). The value of ***C*** range from -1 to +1. It is an indication of greater inequalities when the value moves away from 0. Negative values show that inequalities occur among the low socioeconomic status (Concentration curve appears above the diagonal) while the positive value indicates inequalities favouring the better socioeconomic group (Concentration curve appears below the diagonal) (George A.O. Alleyne et al., 2002).

HI_{wv}, derivatives of ***C***, applied the horizontal concept to measure equity in healthcare use. It is defined as differences between the ***C*** of actual utilisation and ***C*** of predicted utilisation by health need (Owen O'Donnell et al., 2007; Wagstaff A. et al., 1991). To measure fairness in healthcare utilisation, it must first be standardised for differences given by the characteristics such as age, sex, and health status measures, known as "health need." This is based on the notion that equity in healthcare utilisation is achieved whenever the utilisation is based on health need, as previously discussed in chapter two. The term standardisation refers to an adjustment process to facilitate the comparison of outcome measures. This process helps to remove the effect of confounding factors which influence the fair comparison by reducing the variability; those increasing the comparability through an adjustment of the distribution of a measured outcome in relation with other factors. Basically, there are two methods used for standardising against the need in utilisation which are direct and indirect methods. The direct standardisation method provides the distribution of the measured outcome across the socioeconomic groups, while the Indirect Standardisation method however corrects the outcome distribution

through comparison with the entire population (Owen O'Donnell et al., 2007). Both of these standardisation methods can be implemented by conducting regression analysis with either full or partial correlations of the variables of interest with the standardised variables. After standardising the utilisation against needs equity in healthcare can subsequently be obtained for the ***C*** of actual utilisation and that of need predicted utilisation (Owen O'Donnell et al., 2007).

In short, assessing the fairness in healthcare utilisation is essentially examining the distribution of healthcare utilisation based on what is regarded as fair. In this study, an analysis for equity in healthcare utilisation has adopted three different distribution tools for three different levels of assessment which are average utilisation rate, ***C*** and HI_{wv}. This is based on data features as well as the ability of the tools to answer the study objectives. After choosing the three important tools to measure three different levels of fairness for healthcare utilisation, each level of assessment need to be defined as what is regarded as fair and this will be covered in section 4.6.1 page 114. Prior to that, since the measurement of distribution for the healthcare utilisation is made using the ***C*** and HI_{wv}; assessing the distribution for the healthcare utilisation across the living standard, it is therefore imperative to decide on the best measures of the living standard to be used in this study.

4.5.2 Measures of Living Standard

In household surveys conducted in developing countries, income or consumption has frequently been used as the commonest measures to assess the living standard. Income first of all, is defined as the amount of money received during a period of time in exchange for labour or services, from the sale of goods/ property or as a profit from financial investments. It can be classified into four main components such as wage from labour services, rental income from supply of land, capital or any other assets, self-employed income and transfer from any government/non-government agencies/other households. Nonetheless, most of income measures usually exclude the home production component such as agriculture or home-produce goods as a source of income. This has created some argument among the researchers regarding the accuracy of using income as a measure for living standard as the scope of income seems restricted by the exclusion of these agricultural or home-produced goods components which may significantly contribute to the overall income value of the household.

On the other hand, consumption refers to resources actually used by the household. Although most of the consumption components are measured by looking at household expenditure, there is actually a significant difference between these two concepts of measurement. Firstly, expenditure excludes consumption which is not based on market transaction or in other words the expenditure excluded the home production component of the household which particularly need to be considered especially in developing countries. Another

distinctive concept between consumption and expenditure lies on the fact that any purchased good or services may not immediately be consumed but rather used for lasting benefit such as car, house etc. In this case, consumption should be seen as the better measuring for "living standard" as it capture the benefit of the goods rather than the value of the purchase itself.

Debates on the best measures to describe the living standard have been on-going and by far consumption is often the preferred measure particularly for developing countries. This is due to the fact that consumption pattern is more stable or "smoothed" over time as compared to income which was noted to be intermittent and certain incomes were not properly captured or reported. Moreover, this assumption has been supported by two important hypotheses that are relevant in economic behaviour nowadays. The first Theory is Milton Friedman's Permanent Income Hypothesis (PIH) which postulated that, an individual tends to smoothen or stabilise their consumption with short term fluctuations of their income. This is because people's consumption tends to be adjusted based on their long term view of income or notion on wealth over a reasonable period of time. The second hypothesis was developed in the early 1950s by Franco Modigliani and his student Richard Brumbergin. It was known as" life-cycle hypothesis" .This hypothesis stated that an individual plan their consumption pattern and saving behaviour over their life time period and intend to stabilise the consumption behaviour in the best possible manner according to their lifestyle. This theory was postulated by an observation that most of people build up their assets during the initial stage of their working life and spend it during their retirement period to stabilise

consumption according to their need at every stage of the life cycle. Consumption is therefore preferred as the measure of living standard but obtaining complete information on consumption is a challenge to the researcher.

Some surveys include a comprehensive list of consumption items while some others may only cover superficially. Due to the heterogeneity, it is not easy to provide a general guideline on how the consumption aggregates should be constructed. However, most surveys usually cover four main groups of consumption namely food items, non-food, non-durable items, consumer durables, and housing. The reference period usually measures the consumption for a period of one year. This is useful to avoid fluctuation over the consumption and gives a smoother value but the recall period of the consumption item is individualised for different types of goods purchased and whether it is used frequently or infrequently. Developed countries like Europe, where most of the population work in the formal sector, income data are more likely to be used for measuring the living standard rather than consumption which is more complicated. Obtaining data of the living standard from surveys will usually encounter problems especially among the self-employed workers or those who work in informal economic activities who are unwilling to disclose their income and consumption information.

Adjusting for household size and composition

Most data of measures of living standard used household as the unit of analysis. This is mostly due to the time factor involved in getting the individual data and many analyses mostly involve the household unit rather than the individual unit. However, in certain circumstances it is necessary to get the data of the individual unit for more robust analysis. For that purpose, the household living standard measures need to be adjusted for the household composition and size and this can be done using deflator or equivalence scale.

The simple approach to adjust for individual measures of living standard can be obtained from the total household living standard divided by the number of household. However, some economist thought that this approach is not precise enough, based on the argument that the age-specific need differences and the economies of scale which arise from sharing of public goods among the household members are not properly adjusted. To overcome this issue, equivalence of scale can alternatively be used to correct for the household composition, size as well as economies of scale. An equivalence scale has been defined as the income/expenditures of the household divided by the income/expenditures of a single person that shares the same "living standard" as the household and common approach of Adult Equivalent (AE) in the household as:

$$AE = (A+\alpha K)^{\theta}$$

Where *A* is defined by the number of adults in the household, *K* is the number of children, α is the "cost of children," and θ is the degree of economies of scale (Owen O'Donnell et al., 2007). However the challenges in using adult equivalent depends on assigning of an appropriate values for the α and θ. Deaton and Zaidi (2002) proposed values in the region of 0.3 to 0.5 for α and 0.75 to 1.0 for θ for a developed country (Owen O'Donnell et al., 2007). A developing country like Malaysia has yet to apply the equivalence scale in their analysis. This is because the procedure of identifying equivalence scale is rather tedious and arbitrary, however Chai (2008) has made an attempt using α of 0.5 and θ of 1, parallel with the value obtained through many studies done in Asian countries by O'Donnell in 2005 (Chai, 2008).

Choice of the best living standards measures

The precision and robustness of living standard measures serve as a basic requirement when it comes to evaluation of economic policy and social responsibilities of a country. Understanding the whole concept of living standard from every angle of its advantages and disadvantages may give a fair start for overall assessment of government policies particularly that involving public sector allocation for social services and infrastructure which represent a significant amount of government expenditure. Decision on the best measures for living standard reasonably takes into account both the conceptual and practical aspects of the measurement. In many studies, income always appear to be the inferior option used for measuring living standard not merely because of data inaccuracy challenges, but more importantly because income is vulnerable to fluctuation over short period time and does not truly reflect

changes in someone's living standard. Normally, living standard should commensurate with the long-term resources and income does not seem to fit with this notion. Most researchers believe that consumption and asset index are always better for representing the living standard especially consumption which has been explicitly rooted by significant economic theories. However, obtaining the consumption data is expensive, time consuming and may be subjected to error compared to assets and housing data. Although both consumption and asset indices serve as important measures for living standard, in actual practice consumption has been found to have low correlation with the assets indices.

In short the choice of living standard measures is an important deliberation in this equity study. Although consumption data is the more preferred measure for the living standard in developing country like Malaysia, it was not collected in all the data sets used. The total household income i.e. aggregation of the individual income, was used for the analysis. The total household income data was not used arbitrarily but instead was adjusted for household size whereby, the total household income has been divided by the number of person in the household to produce percapita income. This formula would give better reflection of the household living standard although the equivalence of scale was not applied. Due to the absence of conclusive work to develop equivalence of scale specifically for Malaysia and because there is no justified consensus that adjusting for composition of adult and children will provide a better approach for data analysis in this study.

4.6 Data Analysis

Data analysis for this study was performed using STATA version 11.0, taking into account the complex survey design of NHMS data.

4.6.1 Measuring equity in healthcare utilisation

There were three levels of assessment used to measure the fairness of utilisation for the healthcare services; (i) average utilisation rate. (ii) income-gradient in healthcare utilisation and (iii) residual income-gradient in healthcare utilisation standardised for health needs. All of these assessments were made with respect to the individual characteristics, strata, state, region and type of facilities.

The average utilisation rate was assessed based on the minimum threshold for "adequate use" depending on a country's average utilisation rate. The threshold of utilisation rate is set as the minimum criterion rate, whereby the rates of utilisation that is less than the threshold is indicative of having inadequate level of access. The average utilisation rate for out-patient visit achieved in a number of middle-income countries with good healthcare coverage were observed to be in a range 5-6 visits per capita per annum. In term of in-patient services, the average for OECD countries is 158 hospital discharges per 1,000 individuals per year, ranging from a 100 discharges in countries like Canada to over 260 in Austria and France (Global Network for Health Equity, 2015). Global Network for Health Equity (GNHE) proposed a minimum threshold for in-patient services of 100 in-patient discharges per 1,000 populations (Global Network for Health Equity, 2015). Many middle

income countries with good coverage do achieve a similar rate such as in Vietnam with reported rates of 120 in-patient discharges per 1,000 populations (Global Network for Health Equity, 2015). These recommended minimum thresholds are also consistent with the target proposed by WHO on measuring service availability and readiness (SARA), which were 5 out-patient visit per person and 100 discharges per 1,000 individuals (World Health Organisation, 2013a).

The income-gradient in healthcare utilisation was assessed by ***CC*** and ***C***. The ***CC*** is defined as a graphical presentation of cumulative percentage of the health variables plotted on y-axis, against the cumulative percentage of population ranked by their living standards arranged from the poorest to the richest on the x-axis. Meanwhile for ***C***, it is defined with reference to the ***CC***; twice the area between the ***CC*** and line of equality and computation of the ***C*** of the number of healthcare use was made from the convenient covariance formula.

$$\frac{2\sigma_r^2}{\mu} y_i = \alpha + \beta r_i + \varepsilon_i$$

Where σ_r^2 is variance of r_i ,μ is its mean of healthcare utilisationy_i, and r_i is the weighted fractional rank of utilised income, which is defined as

$$r_i = \sum_{j=0}^{i-1} w_j + \frac{w_i}{2},$$

Where $w_i$is the sample weight scaled to sum 1. The utilisation pattern is preferably seen to be concentrating among the less advantage group compared

to the better off population, as lower health status or higher health needs are always reported among the population with lower living standard.

The third level of assessment examines the fairness of healthcare utilisation by standardising the utilisation pattern against health needs as proposed by (Owen O'Donnell et al., 2007). The standardised healthcare utilisation against health need is known as HI_{wv}. It was measured by subtracting the ***C*** of need-predicted utilisation from the ***C*** of actual care utilisation (Owen O'Donnell et al., 2007). The health needs refer to factors that determine the individual's healthcare requirement and those factors are the sex, age and individual health status such as morbidity or dysfunctionalities. The standardised utilisation against health need or HI_{wv} for healthcare use will be obtained by subtracting the ***C*** of need predicted used (***Cp***) from the ***C*** of actual healthcare use (***Cm***). The needs predicted for medical care use were obtained via regression method as shown in the following formula:

$$y_i = \alpha + \beta \ln(inc_i) + \sum_k \gamma_k \, Xk_1 + \sum_p \delta_p Z_{p1} + \in_i, \ldots\ldots\ldots\ldots \textbf{(1)}$$

Given y_i as the utilisation of healthcare service by individual i, $\ln(inc_i)$ is the logarithm of income for individual i, *Xk* is a vector for need group variables, meanwhile *Zp* is for non-need variables with α, *β*, γk and δp being the parameters and $\in i$ is the error term. This equation was then used to generate the predicted utilisation for healthcare service, where $\hat{y}_i^x$ is the expected healthcare utilisation of individual i on the basis of each individual's health needs. The quantity predicted is the amount of the healthcare the individual

should utilise, if they were treated the same as others with the same healthcare needs.

$$\hat{y}_i^x = \hat{\alpha} + \hat{\beta} \ln(i\bar{n}c_i) + \sum_k \hat{\gamma}_k \mathrm{X}k_1 + \sum_p \hat{\delta}_p \overline{Z}_{p1} \ldots\ldots\ldots\ldots\ldots\ldots \textbf{(2)}$$

After obtaining the predicted utilisation ($\hat{y}_i^x$), the indirect standardisation (predicted) of utilisation ($\hat{y}_i^{IS}$) was than obtained using equation **(3)**

$$\hat{y}_i^{IS} = y_i - \hat{y}_i^x + \bar{y} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(3)}$$

Where $\hat{y}_i^{IS}$ is indirectly standardised use, y_i the actual healthcare utilisation, $\hat{y}_i^x$ is the predicted utilisation and $\bar{y}$ is sample mean for the actual healthcare utilisation. After the standardisation process, the ***C*** for both of y_i and $\hat{y}_i^{IS}$ were than calculated using the linear regression method as outlined in (Owen O'Donnell et al., 2007). Once the ***C*** for actual (Cm) and predicted demand (Cp) was calculated, the HI_{wv} was than calculated as follows:

.

$$\boldsymbol{HI} = 2\int_0^1 [L_p(p) - L_m(p)]\, dp = \boldsymbol{C}_{(m)} - \boldsymbol{C}_{(p)} \ldots\ldots\ldots\ldots\ldots\ldots \textbf{(4)}$$

Where L_p is the ***C*** of predicted healthcare utilisation and L_m the ***C*** of actual healthcare utilisation. The HI_{wv} ranges from −2 to 2 where the positive value for HI_{wv} indicates horizontal inequities favouring the rich and negative value of HI_{wv} represents horizontal inequities favouring the poor given their share of need.

4.7 Summary.

In general, the NHMS data sets are reliable sources of information which can be extracted and analysed to answer the objectives for this study. This chapter has highlighted the similarities and comparability across the three data sets hence the possible for all the NHMS data sets to be used to assess the fairness in healthcare utilisation in Malaysia. Despite the variation observed in all the three NHMS data sets, it is still the best source of information that can be used to address the research questions. The specific advantages of utilising the NHMS data sets are its representativeness of the general population and their accessibility.

Analysis on equity status for healthcare utilisation was made using the established tools to measure the healthcare utilisation which are the $\boldsymbol{C}$ and HI_{wv}. These tools examined the distribution for the healthcare utilisation across individuals with different living standard. Therefore, the choice of the appropriate measure of living standard is an important decision for this study. Although the household per capita consumption theoretically will provide better estimation for the measurement of living standard rather than income, but the information on the household consumption was not available in the data sets. Therefore, income was used as proxy measures for the living standard. However, individual income was not arbitrarily used as a measure of living standard instead the total household income per capita was used. The decision on the best measures for living standard has taken into consideration both the conceptual and feasibility aspects of the measurement.

CHAPTER 5: HEALTH STATUS & MULTIMORBIDITY INDEX-THEORIES AND CONCEPTS

5.1 Introduction

The healthcare objective that is socially relevant related to equitable distribution of healthcare services that is fairly accessible to ALL for the purpose of maintaining the population's health (World Health Organisation, 2000). In this respect, evaluation of the healthcare performance will to a certain extent have to be linked with the health outcome or the health status of the population. In addition, an individual's capacity to benefit from the healthcare or his requirement for the care is often related to the individual's health status. Hence, it is essential to understand the actual concept of health and its measurement. It is also necessary to explore if there are other relevant health measurements that are applicable for a developing country like Malaysia that is experiencing significant epidemiological changes caused by rapid economic development.

This chapter begins with section 5.2 which describes the theories and concept of health and its measurement. Section 5.3 discusses the appropriateness of multimorbidity as a measure of the health status. Section 5.3.1 describes the methodology to construct the multimorbidity index to assess the health status among the Malaysian adults. Subsequently, section 5.4 describes the distribution of health status as assessed using the multimorbidity index among the Malaysian adult population at three points in time, 1996, 2006 and 2011, using the NHMS (II), (III) and (IV) datasets. The final section 5.6 summarises

the importance of health status measurement, the prevalence of multimorbidity among the Malaysian adult population and the application of a new multimorbidity index for this study.

5.2 Health and measurement of health

Health has been defined by WHO as a complete state of physical, mental and emotional wellbeing and not only in the absence of disease (Goldsmith, March 1972). Hoyman's et al. (2002) however, perceived health as an optimal personal fitness for maximum meaningful and creative living (Boruchovitch, 2002). Health can also be viewed as the capacity of an organism to maintain a balance, which is reasonably free from pain, discomfort, disability or limitation of action including the social capacity (George P. Smith, 2009). In short, health comprises all elements that make an individual feel well and comfortable. But no matter how health is perceived, the effort to measure health has long started since monitoring the public wellbeing became crucial.

The measurement of health is derived from scales assigned to specific indicators that represent the state of health. Meanwhile, indicators can be selected from any one of four main categories representing the concept of health which include: (a) operational definition of health by WHO which encompass the physical, mental and social aspects, (b) symptoms orientated or any indication of morbidity or illness (c) indicators on fulfilling or performing function, role and activities reflecting the health status and (d) indicators that focus on the adaptation to and coping with non-fatal health conditions (Sadana, 2000; World Health Organisation, 2002). In general, there are many

perspectives of health measures and it can be grouped into population or individual health measures. The examples for population health measures that are commonly used include Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR) and for individual health measures include Self Asses-Health (SAH), McMaster Health Index, Duke Health Profile and Nottingham Health Profile.

An individual health measures can be further categorised into descriptive or methodological groups. The descriptive group focuses on the scope of the measurement whereas the methodological group concentrated on the technical aspect of the measurement such as on record information techniques (McDowell, 2006). Regardless of the classification, health measures can ultimately be grouped into two main categories of measurement which are subjective or objective measures. The differences between subjective and objective measurement lies on the mechanical methods used in collecting and processing the information. Rating that involve the subject judgments are generally termed "subjective measurement" while the "objective measurement" involve no human judgment, in the collection and processing the information (McDowell, 2006).

The SAH is an example of individual subjective health measurement and was captured in NHMS (IV) data set. In general, SAH has been used to assess the individual's health and is often included in general health surveys conducted in many countries. SAH provides an ordinal ranking perceived health status, obtained from respondents evaluating their own health status within a certain

time period (e.g. twelve months or two weeks). This method of assessment has been used in many studies and accepted as established methods for analysing the relationship between the health status and socioeconomic inequalities (Peter C. Smith et al., 2010). Beside the feasibility and inclusive features of SAH, it has widely been used in many studies based on the fact that SAH is a strong predictor of morbidity and mortality (Hernandez-Quevedo, 2005; Sawsan, 2012).

Nevertheless, SAH has been found to contain several weaknesses. First of all, the SAH measurement fails to address what was the reference on the health components, when making their health status assessment. A study by Au (2013) showed that certain health components, such as vitality played an important role in determining the SAH level, while other health components were found to be inconsequential (Au, 2013). This can be argued since health is a complex concept of multi-dimensional physical, mental and emotional wellbeing therefore it cannot arbitrarily be denoted by single health component. Baron-Epel & Kaplan (2001) analyses the agreement between two measures of SAH; general question and age-benchmarked question. They found that SAH appeared to be inconsistent especially among older individuals (65-75 years) compared to the younger age-groups. Apart from that, more optimistic assessment of health was observed among those with more years of education rather than individuals of less educated. With respect to income, studies conducted in Canada by Humphries and van Doorslaer (2000) and in Britain by Hernandez-Quevedo et.al. (2004) indicate that for a given level of clinical health, lower income individuals were more likely to

report poorer level of SAH compared to those in higher income group (Etile, 2006). The ability of self-assessed health to predict mortality is another matter of concern. In 17 studies where SAH measure were reported separately by gender, the association was found stronger in men than women in 11 studies (Spiers, 2003).

Several studies have shown that there is a significant heterogeneity in the distribution of SAH related to income, age, sex, educational level and occupation status (Hernandez-Quevedo, 2005). No doubt that SAH has been used widely in many studies involving health and socioeconomic studies, but the fact that the SAH measures do have some limitation, demands for more research to be conducted on SAH; to explore the actual relationship between age, sex, educational level and occupation with this health measures. It can perhaps be argued that SAH may still be used but rather with caution, especially for the developing country like Malaysia with its diverse demographic composition and socio-economic distribution. Taking into consideration the strength and weaknesses of SAH, it triggered the idea that it will be appropriate to develop other health measures that are more stable/reliable especially for countries like Malaysia that is experiencing significant epidemiological changes caused by vast economic development. An overview of other possible individual health measures especially one that can be constructed using the secondary data profiles is discussed in the following section.

5.3 Multimorbidity

Management and treatment of long–term illnesses impose a great challenge to the government in general and specifically to the healthcare system. Individuals with multimorbidity or those with more than one medical condition require broader approach of healthcare. Despite the growing importance of multimorbidity, the universally accepted definition for multimorbidity has yet to be established. The on-going debate about the terminology and definition for multimorbidity particularly in research fields has currently focussed on several definitions such as (a) co-occurrence of two or more chronic conditions in one person (b) the presence of one or more medical conditions in addition to an index condition (c) co-occurrence of multiple chronic or acute diseases and medical conditions within one person without any reference to an index condition (Aarts, 2012; Huntley A. L. et al., 2012; Jose, 2009).

An increase in the number and type of environmental, social, and personal risks contribute to rapid rise in multimorbidity prevalence (Calypse B. A. et al., 2012; Liam G. G. et al., 2011; Schneider F. et al., 2012; Taylor, 2010). The increasing pattern of multimorbidity prevalence is becoming prominent around the world. In United States it is estimated that 80% of Medicare spending is allocated to patients with two or more chronic conditions. Similar pattern is also seen in Australia where the prevalence of comorbidity or multimorbidity increases significantly with age. Data obtained from 305 general practitioners in 2005 reported that the prevalence of multimorbidity increased with age, with 83% of patients aged 75 years or older had multimorbidity (Holden,

2011; Jose, 2009). Multimorbidity is not just a condition of the elderly. Research recently indicated that the prevalence of multimorbidity among the younger population aged between 20-39 years old is also increasing, especially among those in the lower education level. Populations aged between 40-59 years old who smoke, were 1.71 times more likely to develop multimorbidity compared to those who were non-smokers (Calypse B. A. et al., 2012; Cynthia, 2010; Taylor, 2010). Due to the ageing population and increased longevity, the prevalence of multimorbidity is expected to increase continuously around the world (Taylor, 2010).

People with multimorbidity tend to have poorer functional status, lower quality of life and poor health outcomes (Aarts, 2012; Wijlhuizen G.J. et al., 2012). They were also found to have more frequent and longer hospitalisations, greater use of polypharmacy, spend more on their health and used a greater range of other healthcare services (Cynthia, 2010). Apart from that, patients with multimorbidity were more likely to face conflicting instructions, interrupted care pathways and fragmented medical treatment (Liam G. G. et al., 2011; Schneider F. et al., 2012). The breadth of conflicting advice ranged from treatment, management and medication including exercise and diet. These conflicting advice eventually led to failure of effective medical management as the number of health professionals involved in the patients' care increased. It is therefore imperative for the healthcare services to be adjusted to cater for patients with multiple coexisting diseases (Barnett K. et al., 2012).

To assess the impact of multimorbidity it is necessary to quantify or measure it. Measurement of multimorbidity basically fall into two types which are simple counts of diseases that each individual has and indices of morbidity with different weights assigned to a range of conditions or diseases depending on mortality, severity, or resource utilisation (Huntley A. L. et al., 2012). Thirteen different methods have been identified to measure multimorbidity. Out of these thirteen, six indices used a carefully developed list of clearly defined diagnoses (BOD, Charlson Index, Hallstrom Index, Incalzi Index, Liu Index, and Shwartz Index); three indices rated comorbidity burden by using a system that assessed the effect of comorbid conditions on specific body systems (CIRS, ICED, and Kaplan Index), two indices rated comorbidity on a three or four-point scale using very broad categories (Cornoni-Huntley Index and Hurwitz Index), two methods used every present condition to calculate a score and simply counted the number of present comorbid conditions (de Groot V. et al., 2003).

The Charlson Index, CIRS, ICED, and Kaplan Index were concluded to be valid and reliable methods to measure comorbidity and can be used in clinical research (de Groot V. et al., 2003). For the other indices, their validity and reliability are unclear due to insufficient data related to their clinimetric properties. The Charlson Index is a reliable measure of mortality which is the outcome of interest while the Kaplan Index was specifically developed for use in diabetes research as this index contains clinically relevant information that distinguishes between vascular and nonvascular comorbidity. It uses severity

rankings based on parameters derived from common clinical practice (de Groot V. et al., 2003).

Hence, the multimorbidity indices are useful health measures that can be used for various purposes namely for resource allocation, monitoring as well as treatment evaluation. Based on this understanding, effort is therefore made to assess the prevalence of multimorbidity in Malaysia. The prevalence analyses begin by constructing the Malaysian Adult Multimorbidity Index (MAMI) using several health profiles collected from household health survey data (NHMS data). The methodology for this index construction will be described in the following section.

5.3.1 Methodology of MAMI construction

The MAMI was constructed following eight important steps. It begins from building the theoretical framework up to finally combining all the selected indicators. Since there are no established definitions for multimorbidity, the scope of the definition for this study was made by incorporating both components of acute and chronic illnesses to represent the health status of an adult individual in Malaysia. All health profiles used to construct the MAMI were taken from the NHMS data sets such as hypertension, diabetes, asthma, cholesterol level, kidney problem and the number of common acute/injuries problems, experienced by every individual over a one year period of time. The selected health profiles are as listed in Table 35.1 are confined to individuals aged 30 years old and above. This is because data on morbidity, especially in NHMS (II) were collected among these groups of people. There were 22,148

individuals aged 30 years old and above in NHMS (II), 24,667 individuals in NHMS (III) and 13,162 individual in NHMS (IV). The detailed percentage of respondents with these health profiles are listed in Table 36.1.

The four important health profiles namely hypertension, diabetes, asthma and acute/injuries were selected based on the disease epidemiology in Malaysia. This selection was based on the understanding that the MAMI should be constructed to reflect the individual's health status in Malaysia. Therefore the epidemiological pattern should reflect the Malaysian population health status. Apart from epidemiological distribution, World Health Organisation report has also shown that the non-communicable diseases especially cardiovascular disease appeared to be the main causes of death in Malaysia (Figure 4.1) and contribute to 24.38 per cent of deaths in MOH hospitals in 2014. The top five non-communicable diseases namely ischaemic heart disease, mental illness, cerebrovascular illness, injuries and cancer are five times the rate for communicable disease and contribute about 73 per cent of all mortality in the country. Four major risk factors for non-communicable diseases in South-East Asian countries are raised blood pressure, high body mass index, raised blood sugar levels and abnormal serum lipid concentrations (Dans A. et al., 2011).

More than four health profiles were identified at the beginning, but only four were finally chosen to use to construct the index. This was due to several reasons, namely (a) carefully choosing health profiles that denotes concept of health, (b) reliability/quality of health profiles data, (c) statistically sound for index construction such as low multicollinearity between the selected health

profiles, (d) comparability of those selected health profiles in all the three data sets. The health profile on ischaemic health disease was dropped as part of health status indicator because the questionnaire used to elicit the information on ischaemic heart disease was too general and not specific. The cancer indicator was dropped because the information on cancer was only available in NHMS (II) and not in the other data sets. Table 36.1 shows the distribution of index points for every selected health components.

After selecting the indicator, variables for that health profiles was cleaned and managed accordingly as previously described in section 4.2.4. The correlation between the health profiles was checked and only the variables with low correlation were selected. This is important to prevent the problem of double counting when all the health profiles were later combined.

Before the selected health profiles were combined, all of them were standardised or normalised. This is required as every health profile basically has different units of measurement and the combination of all the health profiles is only possible when all of them are expressed as a common unit. Several techniques of normalisation are available such as rank, standardisation by z-scores and minimum to maximum methods. The rank method was chosen to normalise all the health profiles variables in view of the features of the NHMS data. The health profiles from NHMS data contained variables with multiple outliers thus the rank method was the most suitable method to be used as it will not be affected by the outlier value. Every health profile was ranked from zero (0) to two (2) where, zero (0) was assigned for each

"healthy" result, one (1) for "less healthy," and two (2) for "unhealthy." The rank distribution for each of the health profiles of MAMI components is shown in Table 36.1. The definitions of "healthy", "less healthy" and "unhealthy" are as described in Table 35.1.

The weightage for each selected health profile was than assigned after the normalization process. Assigning weight produces a significant impact on overall composite index. Weight can be assigned by using several techniques namely via statistical approach, input from stakeholder such as by expert or public opinion but most of composite indices were developed using equal weightage (Panagiotakos, 2009). Equal weightage implies that all the variable carry an equal percentage in the index formation. Equal weightage was used for this analysis because there was insufficient consensus about the actual causal relationship between the selected proxy and composite index (Panagiotakos, 2009).

The final step was the aggregation process where all the health profiles were then combined into one composite index. The MAMI is the sum of the scores of these health profiles components; with lower scores indicating a healthy individual and higher score indicating an unhealthy person. The minimum possible points for the MAMI are zero (0) and the maximum possible points are (8).

Table 35.1: The selected health profiles

Health Profiles	Classification	Description
Asthmatic	Normal	Not an Asthmatic patient
	Less healthy	Asthmatic
	Unhealthy	Reported absent from school and work because of asthmatic attack
Diabetic	Normal	Not a Diabetic patient
	Less healthy	Diabetic
	Unhealthy	Developed diabetic complications such as stroke/renal problem
Hypertensive	Normal	Not a Hypertensive patient
	Less healthy	Being Hypertensive
	Unhealthy	Reported absent from school or work because of hypertension
Acute Illness/Injuries	Normal	Not having any acute illnesses/ injuries
	Less healthy	Having acute illness/ injuries
	Unhealthy	Reported absent from school and work because of acute illnesses/ injuries

Table 36.1: Distribution of rank for selected health profiles

Health Component	Score	Frequency (%)		
		[1]1996	[2]2006	[3]2011
Asthmatic Status				
1. Normal	(0)	21,217 (95.8)	23,541 (95.4)	11,269 (85.6)
2. Less healthy	(1)	858 (3.9)	1,136 (4.6)	1,708 (13.0)
3. Unhealthy	(2)	73 (0.3)	0 (0)	185 (1.4)
Diabetic Status				
1. Normal	(0)	20,643 (93.2)	22,297 (90.4)	11,484 (87.3)
2. Less healthy	(1)	1,503 (6.8)	2,334 (9.5)	1,599 (12.2)
3. Unhealthy	(2)	2 (0.0)	46 (0.2)	79 (0.6)
Hypertensive Status				
1. Normal	(0)	17,315 (78.2)	11,471 (46.5)	7,577 (57.6)
2. Less healthy	(1)	4,409 (19.9)	10,880 (44.1)	4,759 (36.2)
3. Unhealthy	(2)	424 (1.9)	2,326 (9.4)	829 (6.3)
Acute Illness/Injuries Status				
1. Normal	(0)	19,180 (86.6)	19,068 (77.3)	9,898 (75.2)
2. Less healthy	(1)	2,684 (12.1)	4,402 (17.8)	2,251 (17.1)
3. Unhealthy	(2)	284 (1.3)	1,207 (4.9)	1,013 (7.7)

Note: [1] National Health and Morbidity Survey Data- II
[2] National Health and Morbidity Survey Data- III
[3] National Health and Morbidity Survey Data- IV

Table 37.1: Distribution of the MAMI in NHMS (II), (III) and (IV) data set

Malaysian Adult Multimorbidity Index (MAMI)	Frequency (%)		
	[1]1996	[2]2006	[3]2011
0	14,121 (63.8)	8,364 (33.9)	5,134 (39.0)
1	5,860 (26.5)	9,308 (37.7)	4,340 (33.0)
2	1,756 (7.9)	4,969 (20.1)	1,964 (14.9)
3	352 (1.6)	1,561 (6.3)	990 (7.5)
4	52 (0.2)	401 (1.6)	473 (3.6)
5	6 (0.0)	67 (0.3)	182 (1.4)
6	1 (0.0)	7 (0.0)	71 (0.5)
7	- (0.0)	- (0.0)	7 (0.1)
8	- (0.0)	- (0.0)	1 (0.0)
Total	**21,148**	**24,677**	**13,162**

Note: [1] National Health and Morbidity Survey Data- II
[2] National Health and Morbidity Survey Data- III
[3] National Health and Morbidity Survey Data- IV

5.4 Prevalence of Multimorbidity

Following the construction of MAMI, the distribution of MAMI was then explored by looking at the mean of the MAMI with respect to several health determinants such as age, education level, and body mass index (BMI) as shown in Table 38.1. The prevalence of MAMI was also examined for different ethnic groups, employment status, strata and region as shown in Table 39.1. These analyses were conducted using STATA statistical package version 11.0

5.4.1 The distribution of MAMI by sex, age, BMI and education level

As reported in many studies, an individual's health status was often linked with several factors namely sex, age, education level, BMI and others (David, 2007; Hopman W. M. et al., 2009; Szklo, 2009; Wei-Yen L. et al., 2007). In this study, it was found that female has higher average of MAMI compared to male (Table 38.1). The mean MAMI was also noted to increase progressively with advancement of age, where the highest mean of multimorbidity occurred among those who are more than 60 years old, followed by 50 to 59 years old, 40 to 49 years old and lastly among those between 30 to 39 years old. A similar pattern was observed in all the three multimorbidity index derived from the three NHMS data sets of 1996, 2006 and 2011. This finding therefore shows that individual health status decreases with increasing age.

Apart from sex and age, it has been frequently reported that there is an inverse relationship between education and morbidity. Individuals with better education level tend to enjoy better health status and have a longer life

expectancy and are less likely to die from acute and chronic diseases (David M. Cutler & Adriana Lleras, 2009). This finding was again illustrated in Table 38.1. Individuals with higher educational background had lower mean MAMI and this association shows that individuals with better education have better health status compared with those with lower or no educational background. This trend was remained similar over time.

Higher BMI is well known to be a contributor of chronic health conditions like hypertension, diabetes and heart disease. These chronic health conditions are primary drivers for most of healthcare burden causing disabilities and death in Malaysia and worldwide (Szklo, 2009; Wei-Yen L. et al., 2007). Table 38.1 shows the association between the BMI and MAMI. Higher BMI is related or correlated with higher multimorbidity index or decreasing health status in the population. In summary this analysis has shown that occurrence of multimorbidity is associated with several health determinants namely sex, age and BMI. The MAMI in this study is similar with 2007 study conducted in Singapore on gender, ethnicity and health behaviour with self-rated health (SRH); indicating that the value of the constructed MAMI contain some comparable properties representing individual health status and is comparable with SRH value (Wei-Yen L. et al., 2007). Increasing medical comorbidity count was strongly associated with reporting worse self-rated health, consistent with the findings of a number of studies in the literature (Perruccioa & Anthony, 2012)

Table 38.1: The mean of Multimorbidity with sex, age, BMI and education level

		[1]1996 Mean* (95% CI)	[2]2006 Mean* (95% CI)	[3]2011 Mean* (95% CI)
Sex				
a.	Male	0.43 (0.41,0.45)	0.93 (0.92,0.96)	0.91 (0.88,0.95)
b.	Female	0.49 (0.48,0.51)	1.00 (0.97,1.02)	1.16 (1.13,1.20)
Age				
a.	30 to 39 years	0.35 (0.33,0.37)	0.65 (0.63,0.67)	0.75 (0.71,0.79)
b.	40 to 49 years	0.45 (0.43,0.47)	0.90 (0.88,0.93)	0.96 (0.91,1.01)
c.	50 to 59 years	0.60 (0.57,0.63)	1.24 (1.21,1.27)	1.23 (1.18,1.29)
d.	60 to 69 years	0.63 (0.60,0.67)	1.43 (1.39,1.46)	1.41 (1.33,1.49)
e.	More than 70 years	0.60 (0.54,0.66)	1.50 (1.45,1.55)	1.58 (1.47,1.70)
BMI				
a.	Underweight	0.39 (0.36,0.42)	0.79 (0.74,0.84)	0.84 (0.73,0.96)
b.	Normal	0.43 (0.41,0.44)	0.82 (0.80,0.84)	0.90 (0.87,0.94)
c.	Overweight	0.54 (0.51,0.56)	1.08 (1.06,1.10)	1.09 (1.04,1.13)
d.	Obese	0.72 (0.66,0.78)	1.32 (1.28,1.35)	1.30 (1.23,1.37)
Education Level				
a.	No Formal Education	0.62 (0.52,0.71)	1.25 (1.21,1.29)	1.41 (1.32,1.50)
b.	Primary Level	0.45 (0.42,0.47)	1.10 (1.08,1.12)	1.14 (1.08,1.20)
c.	Secondary Level	0.37 (0.34,0.40)	0.85 (0.84,0.87)	0.92 (0.87,0.97)
d.	Tertiary level	0.37 (0.34,0.40)	0.72 (0.68,0.76)	0.90 (0.84,0.95)

Note: [1, 2, 3] National Health and Morbidity Survey Data II, III and IV
*Mean of MAMI per person
The value in brackets denotes 95 per cent confidence intervals.

Table 39.1: The distribution of average MAMI by demographic, socioeconomic background and geographical location

	[1]1996 Mean* (95% CI)	[2]2006 Mean* (95% CI)	[3]2011 Mean* (95% CI)
Ethnicity			
a. Malay	0.50 (0.49,0.52)	1.11 (1.09,1.13)	1.13 (1.09,1.16)
b. Chinese	0.36 (0.34,0.38)	0.78 (0.76,0.80)	0.81 (0.77,0.86)
c. Indian	0.44 (0.40,0.48)	1.14 (1.09,1.19)	1.31 (1.20,1.41)
d. Others Bumiputras	0.60 (0.56,0.63)	0.96 (0.92,0.99)	1.18 (1.09,1.27)
e. Others	0.58 (0.48,0.68)	0.96 (0.83,1.10)	1.19 (0.86,1.53)
f. Non-Citizen	0.44 (0.38,0.49)	0.72 (0.66,0.77)	0.81 (0.70,0.92)
Employment			
a. Government	0.43 (0.40,0.47)	0.93 (0.89,0.97)	1.04 (0.96,1.12)
b. Private	0.38 (0.36,0.41)	0.79 (0.77,0.81)	0.83 (0.78,0.87)
c. Self employed	0.44 (0.42,0.46)	0.94 (0.92,0.97)	0.92 (0.87,0.98)
d. Others	0.55 (0.53,0.57)	1.14 (1.12,1.16)	1.28 (1.23,1.32)
Income Quintile			
a. Poorest	0.53 (0.49,0.56)	1.09 (1.06,1.12)	1.05 (0.99,1.11)
b. 2nd Quintile	0.46 (0.43,0.48)	0.98 (0.95,1.01)	1.05 (0.99,1.11)
c. Middle	0.48 (0.45,0.51)	1.01 (0.98,1.04)	1.07 (1.01,1.12)
d. 4rd Quintile	0.46 (0.44,0.49)	0.96 (0.93,0.99)	1.04 (0.98,1.09)
e. Richest	0.42 (0.40,0.44)	0.88 (0.85,0.90)	0.99 (0.94,1.04)
Strata			
a. Urban	0.42 (0.41,0.44)	0.90 (0.87,0.92)	0.98 (0.95,1.02)
b. Rural	0.52 (0.50,0.53)	1.08 (0.06,1.10)	1.17 (1.13,1.21)
Region			
a. Peninsular	0.45 (0.43,0.46)	0.98 (0.97,1.00)	1.03 (1.00,1.06)
b. East Malaysia	0.56 (0.53,0.58)	0.91 (0.89,0.94)	1.06 (1.00,1.12)

Note: [1, 2, 3] National Health and Morbidity Survey Data II, III and IV
*Mean of MAMI per person
The value in brackets denotes 95 per cent confidence intervals.

5.4.2 The distribution of MAMI by demographic, socioeconomic background and geographical location

The distribution of MAMI was subsequently examined across different ethnic groups, employment status, income quintile, strata and region. The Chinese were noted to have highest health status as indicated by them having the lowest multimorbidity index compared to other ethnic groups. The Malays and Indians had the lowest health status or highest multimorbidity index over time. As for the employment status, the individuals who work in the private sector appeared to enjoy better health status compared to those who were self-employed or government employees. Meanwhile, other employment status which comprised the pensioner, housewife or informal-sector employee had the lowest health status. For income distribution, better health status was seen among those in richer income quintile and poorest health status occurred among individuals of poorer income quintile. This trend however slowly diminished over time as the health status appeared to have no significant difference between income quintiles in the 2011 analysis. Distribution of the MAMI across different strata and regions shows that the urban populations were having better health status compared to the rural populations. Meanwhile for regional distribution between Peninsular Malaysia and East Malaysia, the analysis showed that population in the Peninsular had a lower MAMI compared to the population in East Malaysia. The trend of the distribution of MAMI in this strata and regions remained the same over time.

5.5 Strengths and limitations of the analysis

The major strength of this analysis lies on the study sample which is representative of the population that allows for inferences to be deduced from the findings. Thus, these findings represent prevalence estimates for the general adult Malaysian population. Population-based prevalence estimates are important for reporting the health status of the population. This analysis is also one of the first attempts in Malaysia to describe the prevalence of multimorbidity in population of thirty years old and above. The MAMI that was constructed comprises the important health profiles all the three chronic conditions namely hypertension, diabetes, asthma and the acute/injuries components which are the core conditions for inclusion in measures of multimorbidity. Nevertheless this analysis also has some limitations. The cross-sectional nature of the data might not hold true the association between socio-demographic factors and multimorbidity. It is also confined to a limited number of morbidities, which are based on the available data collected in each module of the questionnaires developed for every NHMS data. The MAMI developed may possibly contain a single condition for some individual. This therefore may lead to over estimation of the true prevalence of the multimorbidity.

5.6 Summary

Health in general has been defined from several perspectives. The attempt to measure health has started since monitoring public wellbeing became crucial. There are many perspectives of health measures and can be classified into population or individual health measures. Self-Asses Health (SAH) has been one of the examples to measures health at the individual level. Although this measurement is capable to predict mortality as well as measures for the individual health status at present or in future, however this health measure has been found to have significant heterogeneity in the distribution related to socioeconomic and demographic features. This has led to the idea to use other health status measures that are more stable especially in a country like Malaysia which has varied socioeconomic and demographic characteristic.

In this respect, the multimorbidity is not a condition that is only confined to the elderly. The incidence of multimorbidity has steadily increased with age and is associated with sex, income, ethnic groups, employment status and shares comparable features found in SAH. The multimorbidity index therefore is a possible approach to be utilised to measure the individual health status. The multimorbidity index constructed in this chapter has been found to have the properties that reflect the individual's health status. It is associated with demographic and socioeconomic characteristics. All the information obtained from this analysis not only important for designing guidelines and strategies to improve treatment, but will also be useful for any other analyses that require health status information at the individual level.

CHAPTER 6: DISTRIBUTION OF UTILISATION FOR OUT-PATIENT CARE

6.1 Introduction

The objective of this study is to assess the fairness of utilisation for both out-patient and in-patient care in the Malaysian healthcare system. Chapter 6 is focused on fairness in healthcare utilisation for out-patient care. This was assessed at three levels of assessment; (i) average utilisation rate, (ii) income-gradient in healthcare utilisation and (iii) residual income-gradient in healthcare utilisation standardised for health needs. The assessment for income-gradient in healthcare utilisation was made using the ***C***. The residual income-gradient in healthcare utilisation after standardising for health needs, was assessed by the HI_{wv}. All the three levels of the assessments were made across the sociodemographic characteristics, urban/rural residence, regions (Peninsular Malaysia and East Malaysia) and by different healthcare facilities ownership (government and private). Health status assessment for the HI_{wv} was made using the MAMI. The description of the development of MAMI is described in Chapter Five.

The Malaysian healthcare system has evolved over many years and there has been great expansion in the services delivered by the government. The private sector have also made important contributions thus, the assessment of fairness in utilisation for out-patient care in this chapter was made at three points in time spanning over 15-years period from 1996 to 2011 when the private health sectors participation expanded significantly.

This chapter begins with section 6.2 which describes the data sources and specifications used in the analysis. This section also describes the estimation method in measuring fairness of utilisation for out-patient care services. Section 6.3 contains the results of the analysis on fairness of utilisation for out-patient care in Malaysia and is arranged into sections for results at individual level, strata, state, regional, and types of facilities. This chapter concludes with section 6.4 providing a summary of the overall findings for this chapter.

6.2 Data and Methodology

6.2.1 Data source and specification

The data for this analysis was obtained from the nationally representative household health survey data - NHMS (II), (III) and (IV) collected by MOH Malaysia in 1996, 2006 and 2011 respectively. This data was collected through face-to-face interviews from non-institutionalized civilian population in all the 15 states and federal territories in Malaysia as described in Chapter Four. The information obtained covered a wide range of health information pertaining to acute and chronic illnesses, injuries, disabilities and healthcare expenditure.

6.2.2 Concept of Measurement

The fairness in healthcare utilisation for out-patient care was assessed on three levels of assessment; (i) average utilisation rate (ii) income-gradient healthcare utilisation and (iii) residual income-gradient in utilisation standardised for health needs. All these assessments were made across the individual characteristics, strata, state and regional and types of healthcare facilities as explained in Chapter Four, under section 4.6.1 on page 114

6.3 Results

6.3.1 Distribution of average utilisation rate and income-gradient in healthcare utilisation for out-patient care visits, by individual characteristics

Table 40.1 shows the average utilisation rate for out-patient care services by individual characteristic of sex, ethnicity and employment status for 1996, 2006 and 2011. In 1996, the average utilisation rates for out-patient care services for male was 3.4 (95% CI: 3.1, 3.7) visits per capita per annum and for female was 3.5 (95% CI: 3.3, 3.8) visits per capita per annum. There was no significant difference and this status remained unchanged for year 2006 and 2011.

For ethnicity, in 1996, the average utilisation rate for out-patient care services also showed no significant difference among all the ethnic groups of Malays, Chinese, Indian, Other-Bumiputras and Non-Citizens. However, in 2006 Chinese and other Bumiputras had lower average utilisation rate compared to

other ethnic groups. In 2011, the average utilisation rates for all the ethnic grouped showed no significant difference.

For employment status, there was no significant difference in the average utilisation rates among all the employment status in all the respective years of 1996, 2006 and 2011.

Table 41.1 shows the ***C*** for out-patient care services utilisation by individual characteristics of sex, ethnicity and employment status, in 1996, 2006 and 2011. For males, the distribution of out-patients care utilisation in 1996 was equally distributed across the income-gradient. In 2006, the distribution concentrated among the poor. However it became equally distributed across the incomes-gradient again in 2011. For females, the out-patient care utilisation in 1996 was concentrated among the rich but became equally distributed across the income-gradient in 2006 and 2011.

For ethnicity, the distribution of out-patient care utilisation in 1996 for all the ethnic groups except for Malays and Non-Citizens were equally distributed across the income-gradient. The distribution of out-patient care utilisation for Malays and Non-Citizens were concentrated among the rich. However, in 2006 and 2011, the distributions of out-patient care utilisation for all the ethnic groups were equally distributed across the income-gradient.

For employment status, in 1996, the distributions of out-patient care utilisation across the income-gradient for other types of employment status (i.e. the pensioners/retirees (public and private sector), housewives, students and workers in informal sectors) were concentrated among the rich. Meanwhile, for government, private sector and self-employed status, the distribution of out-patient care utilisation were equally distributed across the income-gradient. However in year 2006 and 2011, the distribution of out-patient care utilisation for all the employment status was equally distributed across the income-gradient.

Table 40.1: Average utilisation rate for out-patient care visits for adults aged 30 years old and above, for years 1996, 2006 and 2011

		1996		2006		2011	
		Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average[1]**	**Percentage (%)**
Sex	Male	3.4 (3.1,3.7)	45.2	2.8 (2.5,3.1)	47.2	4.8 (4.1,5.5)	48.5
	Female	3.5 (3.3,3.8)	54.8	2.9 (2.7,3.1)	50.8	4.7 (4.2,5.2)	51.5
Ethnicity	Malay	3.5 (3.2,3.8)	49.5	3.7 (3.4,3.9)	58.5	4.2 (3.8,4.6)	49.5
	Chinese	3.0 (2.6,3.3)	24.0	1.6 (1.4,1.8)	17.8	4.3 (3.3,5.2)	23.1
	Indian	4.2 (3.6,4.9)	11.8	4.3 (3.5,5.2)	10.0	7.4 (6.0,8.8)	10.1
	Others Bumiputras	3.9 (3.4,4.4)	9.3	2.1 (1.7,2.4)	7.0	6.8 (4.7,8.8)	11.4
	Others	4.2 (3.0,5.5)	1.7	3.5 (1.8,5.2)	0.8	3.6 (1.6,5.6)	0.4
	Non-Citizen	3.2 (2.4,4.1)	3.7	2.3 (1.7,2.9)	6.0	5.4 (1.9,8.8)	5.4
Employment Status	Government	3.0 (2.5,3.4)	10.3	2.8 (2.3,3.3)	9.1	3.7 (2.9,4.4)	9.0
	Private	4.3 (3.9,4.7)	33.4	2.8 (2.5,3.1)	29.8	4.9 (4.1,5.8)	33.2
	Self employed	2.9 (2.6,3.3)	19.3	2.5 (2.2,2.8)	20.8	4.4 (3.0,5.7)	16.4
	Others	3.3 (3.0,3.6)	37.0	3.1 (2.8,3.5)	40.3	5.1 (4.6,5.7)	41.4
Total		**3.5 (3.3,3.6)**	**100**	**2.9 (2.7,3.1)**	**100**	**4.8 (4.3,5.2)**	**100**

Note: [1]Average number for out-patient care visits per capita per annum.
The value in brackets denotes 95 per cent confidence intervals.

Table 41.1: Concentration Index (***C***) for out-patient care visits for adults aged 30 years old and above, for years 1996, 2006 and 2011

		1996	2006	2011
		C	***C***	***C***
Sex	Male	-0.004 (-0.055,0.046)	-0.083 (-0.153,-0.012)	-0.066 (-0.173,0.041)
	Female	0.076 (0.031,0.120)	0.010 (-0.040,0.060)	-0.022 (-0.080,0.036)
Ethnicity	Malay	0.071 (0.021,0.121)	-0.010 (-0.074,0.054)	0.021 (-0.031,0.072)
	Chinese	0.064 (-0.021,0.148)	0.018 (-0.063,0.099)	-0.019 (-0.135,0.097)
	Indian	-0.059 (-0.157,0.040)	0.033 (-0.136,0.202)	-0.083 (-0.256,0.089)
	Others Bumiputras	-0.010 (-0.067,0.087)	0.015 (-0.093,0.123)	-0.043 (-0.095,0.181)
	Others	-0.025 (-0.187,0.136)	0.306 (-0.181,0.793)	-0.288 (-0.654,0.078)
	Non-Citizen	0.185 (0.063,0.306)	-0.149 (-0.273,-0.026)	-0.385 (-0.926,0.157)
Employment Status	Government	0.054 (-0.038,0.146)	0.023 (-0.088,0.135)	-0.104 (-0.235,0.027)
	Private	-0.020 (-0.072,0.031)	-0.070 (-0.138,-0.003)	0.022 (-0.060,0.104)
	Self employed	0.004 (-0.084,0.092)	-0.055 (-0.122,0.011)	-0.170 (-0.405,0.066)
	Others	0.072 (0.011,0.133)	-0. 009 (-0.110,0.090)	-0.016 (-0.081,0.048)
Total		**0.036 (0.002,0.069)**	**-0.039 (-0.083,0.004)**	**-0.045 (-0.106,0.017)**

Note: ***C***: The Concentration Index for out-patient care utilisation.
The value in brackets denotes 95 per cent confidence intervals.

6.3.2 Distribution of average utilisation rate and income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs, for out-patient care visits, by urban and rural strata

Table 42.1 shows the average utilisation rate for out-patient care services by urban and rural strata in 1996, 2006 and 2011. In 1996, there was higher out-patient utilisation rate in the rural areas which was 3.8 (95% CI: 3.5, 4.0) visits per capita per annum compared to urban areas with 3.2 (95% CI: 3.0, 3.4) visits per capita per annum. The findings for year 2006 showed a similar pattern, where the average utilisation rate was still higher in the rural areas with 3.5 (95% CI: 3.2, 3.8) visits per capita per annum than in urban areas with 2.5 (95% CI: 2.2, 2.7) visits per capita per annum. However, in 2011 there was no significant difference in the average utilisation rates between urban and rural areas (Figure 10.1).

Table 43.1 shows the ***C*** for out-patient care services by urban and rural strata in 1996, 2006 and 2011. In 1996, the distribution of out-patient care utilisation in the urban areas was concentrated among the rich, whereas for the rural areas, the distribution was equally distributed across the income-gradient. In 2006, the distributions of out-patient care utilisations for both urban and rural areas were equally distributed across the income-gradient. Similar finding was also observed in 2011.

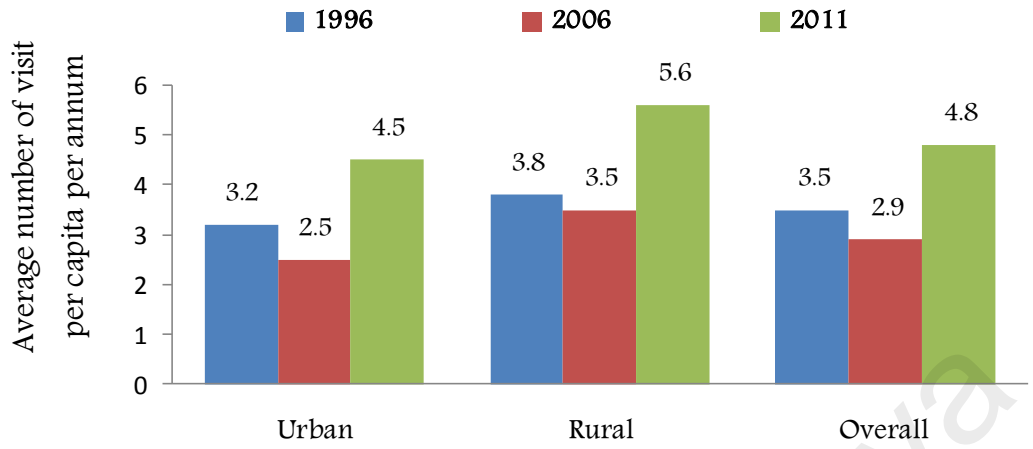


Figure 10.1: Average utilisation rate between urban and rural for year 1996, 2006 and 2011

Table 44.1 shows the HI_{wv} for out-patient care services, by urban and rural areas in 1996, 2006 and 2011. In 1996, the HI_{wv} in urban areas was positive indicating that the utilisation of out-patient care after standardising for health need in the urban areas was concentrated among the rich. Meanwhile, in the rural areas, the utilisation for out-patient visits after standardising for health need was equally distributed across income-gradient. Subsequently in year 2006 and 2011, the distribution of HI_{wv} for both urban and rural areas indicates that the out-patient utilisation after standardising for health need was equally distributed across the entire income-gradient.

Table 42.1: Average utilisation rate for out-patient care visits by urban and rural strata for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average[1]**	**Percentage (%)**
Urban	3.2 (3.0,3.4)	52.2	2.5 (2.2,2.7)	53.2	4.5 (4.0,4.9)	70.3
Rural	3.8 (3.5,4.0)	47.8	3.5 (3.2,3.8)	46.8	5.6 (4.5,6.6)	29.1
Overall	**3.5 (3.3,3.6)**	**100.0**	**2.9 (2.7,3.1)**	**100.0**	**4.8 (4.3,5.2)**	**100.0**

Note: [1]Average number of visits for out-patient care per capita per annum.
The value in brackets denotes 95 per cent confidence intervals.

Table 43.1: Concentration Index (***C***) for out-patient care visits by urban and rural strata for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Urban	0.075 (0.026,0.124)	-0.029 (-0.082,0.024)	-0.030 (-0.089,0.029)
Rural	0.036 (-0.011,0.082)	0.022 (-0.047,0.090)	-0.029 (-0.053,0.096)
Overall	**0.036 (0.002,0.069)**	**-0.039 (-0.083,0.004)**	**-0.045 (-0.106,0.017)**

Note: *C*: Concentration Index.
The value in brackets denotes 95 per cent confidence intervals.

Table 44.1: Horizontal Inequity Index (HI_{wv}) for out-patient care visits by urban and rural strata for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Urban	0.086 (0.039,0.133)	-0.001 (-0.050,0.050)	-0.027 (-0.081,0.028)
Rural	0.027 (-0.021,0.074)	-0.001 (-0.072,0.074)	-0.031 (-0.165,0.104)
Overall	**0.043 (0.010,0.076)**	**-0.021 (-0.065,0.022)**	**-0.033 (-0.094,0.027)**

Note: HI_{wv}: Horizontal Inequity Index
The value in brackets denotes 95 per cent confidence intervals.

6.3.3 Distribution of average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs, for out-patient care visits, by state and region

Table 45.1 to Table 50.1 show the average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation after standardising for health needs, for the out-patient care visits, by state and regional in Malaysia, in year 1996, 2006 and 2011

Table 45.1 shows the average utilisation rate for out-patient care, by state in Peninsular Malaysia for adults aged 30 years old and above for years 1996, 2006 and 2011. In 1996, Kedah had the lowest out-patient utilisation rates of 2.5 (95% CI: 1.9, 3.1) visits per capita per annum. In the same year, Melaka with 4.7 (95% CI: 3.7, 5.7) visits per capita per annum and Negeri Sembilan with 6.3 (95% CI: 5.0, 7.5) visits per capita per annum had the highest rates of out-patient utilisation rates respectively. Subsequently, in 2006, the states of Penang with 1.6 (95% CI: 1.3, 2.0) visits per capita per annum and Kuala Lumpur with 1.7 (95% CI: 0.9, 2.4) visits per capita per annum had the lowest out-patient utilisation rate of and Kedah had the highest rates of 5.8 (95% CI: 5.2, 6.5) visits per capita per annum. However in 2011, three states namely Kelantan, Kedah and Terengganu had the lowest out-patient utilisation rates of 2.8 (95% CI: 2.0, 3.6), 2.2 (95% CI: 1.6, 2.8), 2.6 (95% CI: 1.9, 3.3) visits per capita per annum respectively and Negeri Sembilan had the highest rates of 7.7 (95% CI: 5.3, 10.2) visits per capita per annum.

Table 46.1 shows the average utilisation rate for out-patient care services, by states in East Malaysia for adults aged 30 years old and above for years 1996, 2006 and 2011. In 1996, Sarawak with 2.8 (95% CI: 2.4, 3.2) visits per capita per annum had a lower average utilisation rate for the out-patient care services compared with other states (Table 45.1). In 2006, both states in East Malaysia namely Sabah with 2. 1 (95% CI: 1.8, 2.5) visits per capita per annum and Sarawak with 2.1 (95% CI: 1.6, 2.6) visits per capita per annum had lower average utilisation rate compared to other states in Peninsular Malaysia (Table 45.1). However, in 2011, the average utilisation rate for the states of Sabah and Sarawak were not significantly different from the other states in Peninsular Malaysia (Table 45.1 and Table 46.1). In general, there was no significant difference in average utilisation rate for out-patient care services between Peninsular and East Malaysia except in 2006, where the average utilisation rate in East Malaysia was found lower than the average utilisation rate in Peninsular Malaysia (Table 45.1 and Table 46.1).

Table 47.1 shows the ***C*** for out-patient visits, in Peninsular Malaysia for adults aged 30 years old and above for years 1996, 2006 and 2011. In 1996, the distribution of out-patient care utilisation in all states in Peninsular Malaysia, except for Selangor and Pahang was equally distributed across the income-gradient. The distribution of out-patient care utilisation in Selangor and Pahang were concentrated among the rich. In 2006, the distribution of out-patient care utilisation in all the states in Peninsular Malaysia, except for Negeri Sembilan and Melaka was equally distributed across the income-gradient. In the state of Negeri Sembilan, the out-patient care utilisation was

concentrated among the rich, while for Melaka it was concentrated among the poor. In 2011, the distribution of out-patient care utilisation in all states in Peninsular Malaysia was equally distributed across the income-gradient. In general, the distribution of out-patient care in Peninsular Malaysia in 1996 was concentrated among the rich, in 2006 it was concentrated among the poor and was equally distributed across the income-gradient by the year 2011.

Table 48.1 shows the ***C*** for out-patient care utilisation in East Malaysia for adults aged 30 years old and above, for years 1996, 2006 and 2011. The result shows that the distribution of out-patient care utilisation in the state of Sabah or Sarawak for all the years 1996, 2006 and 2011 were equally distributed across the income-gradient.

Table 49.1 and Table 50.1 show the HI_{wv} for out-patient care utilisation by state in Peninsular Malaysia and East Malaysia, for adults aged 30 years old and above, for years 1996, 2006 and 2011. In 1996, the HI_{wv} for all the states in Malaysia excluding Selangor indicates that the distribution for out-patient care utilisation after standardising for health need was equally distributed across the income-gradient. The value of HI_{wv} for out-patient care utilisation in Selangor indicated that the distribution of care after standardisation of health needs was concentrated among the rich, but became equally distributed in 2006 and 2011. In 2006, the HI_{wv} for all the states in Malaysia excluding Melaka and Negeri Sembilan indicates that the distribution of out-patient care utilisation after standardising for health need was equally distributed across the income-gradient. The HI_{wv} in Melaka showed that the distribution was

concentrated among the poor, while for Negeri Sembilan was concentrated among the rich. In 2011, the HI_{wv} for all the states in Malaysia excluding Terengganu indicates that the distribution of out-patient care utilisation after standardising for health need was equally distributed across the entire income-gradient. The HI_{wv} in Terengganu was however concentrated among the poor.

In general, the HI_{wv} for out-patient care in Peninsular Malaysia in 1996 indicates that the out-patient care distribution was concentrated among the rich meanwhile for East Malaysia the distribution indicates that the out-patient care utilisation after standardising for the health need was equally distributed across the income-gradient. However, in 2006 and 2011, the HI_{wv} for both in Peninsular Malaysia and East Malaysia indicates that the distribution of out-patient care utilisation after standardising for the health need, in 2006 and 2011 had become equally distributed.

Table 45.1: Average utilisation rate for out-patient care visits, by states (Malaysia Peninsular) for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average [1]**	**Percentage (%)**
Johor	3.2 (2.7,3.7)	12.1	2.5 (2.1,3.0)	10.3	6.4 (4.6,8.2)	14.6
Kedah	2.5 (1.9,3.1)	5.4	5.8 (5.2,6.5)	14.3	2.8 (2.0,3.6)	5.4
Kelantan	3.3 (2.5,4.2)	5.9	4.2 (2.8,5.5)	7.8	2.2 (1.6,2.8)	3.0
Melaka	4.7 (3.7,5.7)	4.6	2.9 (2.0,3.8)	2.7	5.0 (3.3,6.9)	3.0
Negeri Sembilan	6.3 (5.0,7.5)	6.7	4.0 (3.2,4.8)	5.7	7.7 (5.3,10.2)	5.6
Pahang	3.6 (2.8,4.5)	5.1	3.4 (2.7,4.1)	6.8	3.2 (2.3,4.1)	4.0
Pulau Pinang	3.3 (2.6,4.0)	5.6	1.6 (1.3,2.0)	4.5	3.5 (2.4,4.6)	5.5
Perak	3.5 (2.8,4.2)	9.6	2.0 (1.1,2.9)	4.5	6.6 (5.0,8.2)	12.5
Perlis	3.2 (2.3,4.0)	0.9	2.9 (1.5,4.2)	0.8	3.2 (2.3,4.1)	0.7
Selangor	3.2 (2.8,3.7)	19.7	3.1 (2.7,3.5)	21.4	3.7 (3.1,4.4)	18.0
Terengganu	3.1 (2.4,3.8)	3.4	3.6 (2.6,4.5)	3.6	2.6 (1.9,3.3)	2.2
Kuala Lumpur	3.7 (3.0,4.4)	6.9	1.7 (0.9,2.4)	2.9	5.2 (3.3,7.1)	7.7
Peninsular Malaysia	3.5 (3.3,3.7)	85.8	3.0 (2.8,3.3)	85.9	4.5 (4.1,5.0)	82.4
Total	**3.5 (3.3,3.6)**	**100**	**2.9 (2.7,3.1)**	**100**	**4.8 (4.3,5.2)**	**100**

Note: [1]Average number of visits for out-patient care per capita per annum.
The value in brackets denotes 95 per cent confidence intervals.

Table 46.1: Average utilisation rate for out-patient care visits, by states (East Malaysia) for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average [1]**	**Percentage (%)**
Sabah & Labuan	3.9 (3.3,4.4)	7.7	2.1 (1.8,2.5)	7.9	7.9 (4.9,10.9)	10.1
Sarawak	2.8 (2.4,3.2)	6.4	2.1 (1.6,2.6)	6.2	3.8 (2.8,4.8)	7.5
East Malaysia	3.3 (3.3,3.7)	14.2	2.1 (1.8,2.4)	14.1	5.9 (4.3,7.5)	17.6
Total	**3.5 (3.3,3.6)**	**100**	**2.9 (2.7,3.1)**	**100**	**4.8 (4.3,5.2)**	**100**

Note: [1]Average number of visits for out-patient care per capita per annum.
The value in brackets denotes 95 per cent confidence intervals.

Table 47.1: Concentration Index (***C***) for out-patient care visits in Peninsular Malaysia for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Johor	0.044 (-0.052,0.140)	-0.084 (-0.185,0.017)	0.034 (-0.083,0.150)
Kedah	-0.073 (-0.207,0.062)	0.031 (-0.047,0.109)	0.041 (-0.115,0.198)
Kelantan	0.095 (-0.088,0.278)	-0.150 (-0.397,0.097)	-0.014 (-0.190,0.162)
Melaka	-0.031 (-0.163,0.01)	-0.372 (-0.638,-0.106)	0.092 (-0.139,0.323)
Negeri Sembilan	0.049 (-0.111,0.210)	0.140 (0.046,0.235)	-0.110 (-0.307,0.087)
Pahang	0.148 (0.002,0.294)	0.103 (-0.039,0.245)	-0.094 (-0.261,0.073)
Pulau Pinang	-0.031 (-0.154,0.092)	-0.074 (-0.236,0.087)	-0.058 (-0.232,0.116)
Perak	0.009 (-0.159,0.178)	0.039 (-0.233,0.312)	-0.075 (-0.198,0.049)
Perlis	0.038 (-0.157,0.232)	-0.042 (-0.341,0.259)	-0.122 (-0.273,0.030)
Selangor	0.079 (0.003,0.156)	-0.079 (-0.159,0.001)	0.011 (-0.127,0.148)
Terengganu	0.034 (-0.117,0.185)	0.007 (-0.163,0.177)	-0.095 (-0.234,0.44)
Kuala Lumpur	0.052 (-0.080,0.185)	-0.023 (-0.398,0.351)	-0.093 (-0.339,0.154)
Peninsular Malaysia	**0.044 (0.006,0.083)**	**-0.072 (-0.124,-0.020)**	**-0.004 (-0.054,0.046)**

Note: ***C*****:** Concentration Index.
The value in brackets denotes 95 per cent confidence intervals.

Table 48.1: Concentration Index (***C***) for out-patient care visits in East Malaysia, for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Sabah & Labuan	0.022 (-0.057,0.101)	0.073 (-0.038,0.184)	-0.169 (-0.404,0.067)
Sarawak	-0.063 (-0.151,0.024)	-0.039 (-0.183,0.104)	-0.018 (-0.136,0.101)
East Malaysia	**-0.017 (-0.076,0.042)**	**0.021 (-0.067,0.109)**	**-0.129 (-0.296,0.037)**

Note: *C*: Concentration Index.
The value in brackets denotes 95 per cent confidence intervals.

Table 49.1: Horizontal Inequity Index (HI_{wv}) for out-patient care visits, by state (Peninsular Malaysia) for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Johor	0.077 (-0.013,0.167)	-0.050 (-0.142,0.044)	0.020 (-0.111,0.150)
Kedah	-0.058 (-0.186,0.069)	0.037 (-0.052,0.125)	0.066 (-0.092,0.223)
Kelantan	0.079 (-0.111,0.270)	-0.249 (-0.539,0.040)	-0.047 (-0.186,0.091)
Melaka	-0.051 (-0.184,0.081)	-0.318 (-0.606,-0.031)	0.111 (-0.103,0.324)
Negeri Sembilan	0.023 (-0.150,0.195)	0.129 (0.029,0.228)	-0.118 (-0.317,0.081)
Pahang	0.139 (-0.124,0.302)	0.097 (-0.046,0.241)	-0.086 (-0.237,0.064)
Pulau Pinang	-0.041 (-0.153,0.071)	-0.055 (-0.199,0.088)	-0.022 (-0.138,0.095)
Perak	-0.008 (-0.137,0.155)	-0.081 (-0.192,0.355)	-0.106 (-0.253,0.041)
Perlis	-0.001 (-0.225,0.224)	-0.129 (-0.519,0.261)	-0.111 (-0.244,0.022)
Selangor	0.083 (0.012,0.154)	-0.037 (-0.114,0.040)	0.065 (-0.056,0.186)
Terengganu	0.033 (-0.134,0.199)	-0.017 (-0.194,0.160)	-0.104 (-0.202,-0.005)
Kuala Lumpur	0.087 (-0.041,0.216)	0.017 (-0.294,0.330)	-0.054 (-0.297,0.188)
Peninsular Malaysia	**0.056 (0.019,0.093)**	**-0.045 (-0.096,0.007)**	**-0.001 (-0.048,0.047)**

Note: **HI_{wv}**: Horizontal Inequity Index.
The value in brackets denotes 95 per cent confidence intervals.

Table 50.1: Horizontal Inequity Index (HI_{wv}) for out-patient care visits, by state (East Malaysia) for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Sabah & Labuan	0.028 (-0.058,0.114)	0.064 (-0.040,0.167)	-0.107 (-0.392,0.178)
Sarawak	-0.063 (-0.153,0.028)	-0.043 (-0.180,0.093)	-0.044 (-0.156,0.068)
East Malaysia	**-0.013 (-0.076,0.050)**	**0.014 (-0.068,0.096)**	**-0.093 (-0.269,0.082)**

Note: **HI_{wv}**: Horizontal Inequity Index.
The value in brackets denotes 95 per cent confidence intervals.

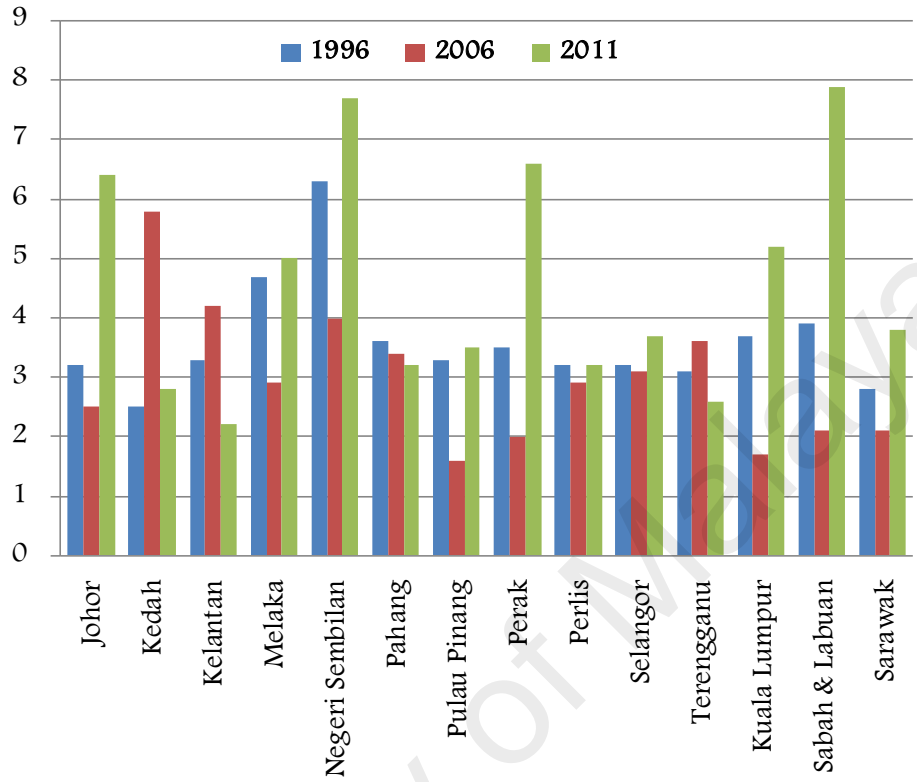


Figure 11.1: Average number of utilisation for out-patient care per capita per annum by state in Malaysia for year 1996, 2006 and 2011

6.3.4 Distribution of average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs, for out-patient care visits, by public and private facilities.

Table 51.1 shows the average utilisation rates for out-patient care visits by types of facilities across strata and regions for adults aged 30 years old and above for years 1996, 2006 and 2011. In 1996, the overall average utilisation rate for out-patient care were higher in the private facilities which was 2.5 (95% CI: 2.3 , 2.6) visits per capita per annum than in public facilities which was 1.0 (95% CI: 0.8 ,1.1) visits per capita per annum. However, the overall average utilisation rate for the out-patient care services between public facilities and private facilities were not significantly different in year 2006 and 2011.

For the public facilities, the average utilisation rate for out-patient care visits were higher in the rural areas compared to urban areas in year 1996, 2006 and 2011. The average utilisation rates for the out-patient care were also higher in East Malaysia compared to Peninsular Malaysia in 1996 and 2011 but in 2006, the average utilisation rate was higher in Peninsular Malaysia than East Malaysia (Figure 12.1).

For the private facilities, the average utilisation rate for out-patient care services were higher in the urban areas compared to rural areas in year 1996, 2006 and 2011. The average utilisation rate was seen higher in Peninsular Malaysia than in East Malaysia in 1996, but there was no significant difference in the average

utilisation between the Peninsular Malaysia and East Malaysia in 2006 and 2011 (Figure 12.1).

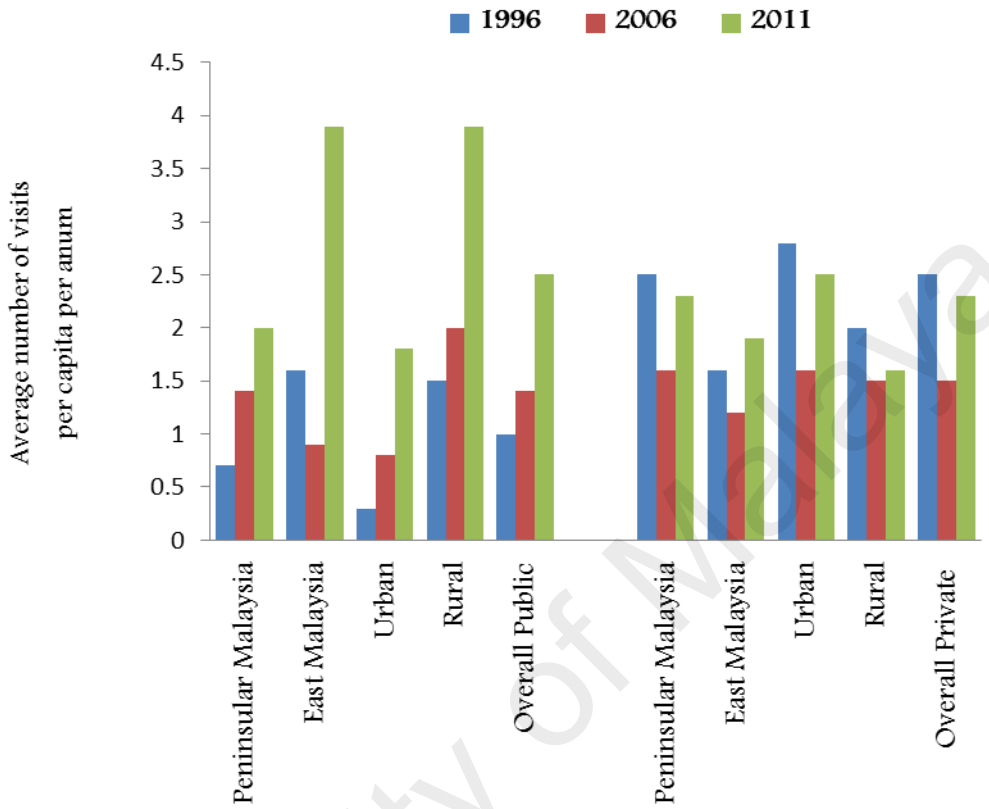


Figure 12.1: Average out-patient care utilisation by public and private facilities across strata and region in Malaysia for year 1996, 2006 and 2011

Table 52.1 shows the ***C*** for out-patient care visits, by types of facilities across strata and regions for adults aged 30 years and above for years 1996, 2006 and 2011. For the public facilities, in 1996, the analysis shows that the distribution of out-patient care utilisation in Peninsular Malaysia, East Malaysia, urban and rural areas were all concentrated among the poor. However, in 2006, this pattern had changed. The ***C*** for out-patient care utilisation in East Malaysia and rural areas indicates that the out-patient care utilisation were equally distributed across the

income-gradient. Meanwhile for Peninsular and urban areas, the distributions of the out-patient care utilisation were still concentrated among the poor. In 2011, the distributions of out-patient care utilisation in Peninsular Malaysia, East Malaysia, and urban areas were all concentrated among the poor except in rural areas. Out-patient care utilisation in the rural areas was equally distributed across the income gradient. (Figure 13.1).

For the private facilities, in 1996, the distributions of out-patient care utilisation in Peninsular Malaysia, East Malaysia, urban and rural areas were all concentrated among the rich. However, in 2006, these patterns changed. The distribution of out-patient care utilisation in urban areas was equally distributed across the income-gradient. Meanwhile for Peninsular Malaysia, East Malaysia and rural areas, the distribution of out-patient care utilisation remained concentrated among the rich. In 2011, the distribution of out-patient care utilisation in Peninsular Malaysia and rural areas were concentrated among the rich but for the urban and East Malaysia, the distribution of out-patient care utilisation was equally distributed across the income-gradient (Table 52.1, Figure 13.1).

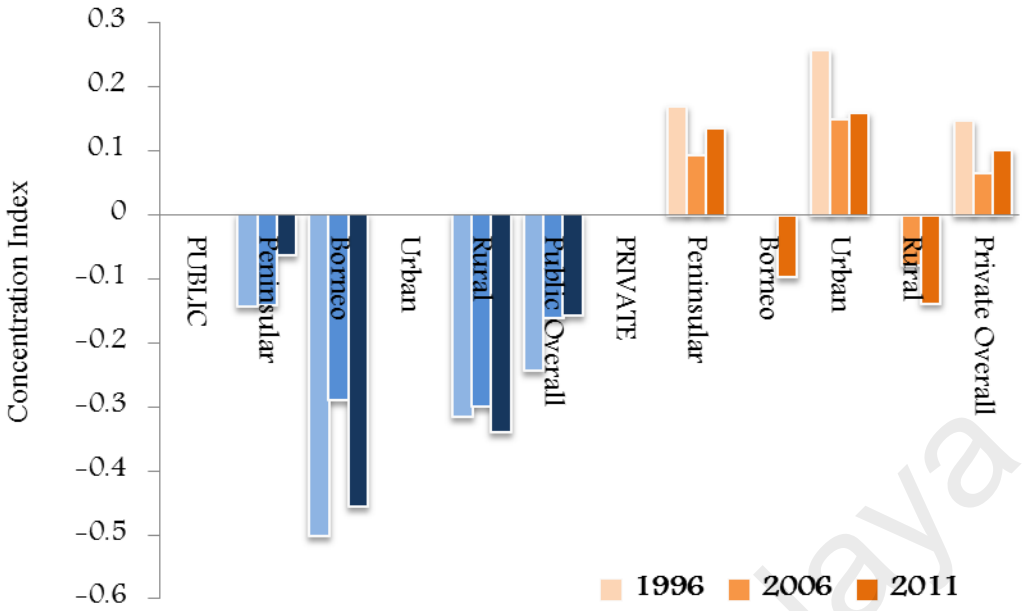


Figure 13.1: Income-related inequality for out-patient care by public and private facilities for year 1996, 2006 and 2011

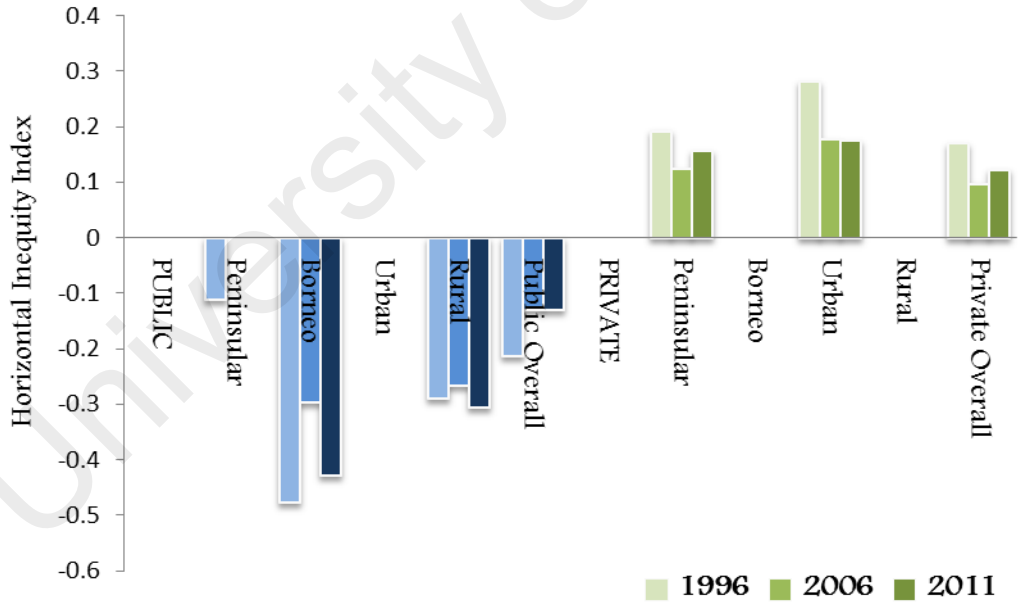


Figure 14.1: Income-related inequity after standardising for health need in public and private facilities by different strata and regions in 1996, 2006 and 2011

Table 53.1 shows HI_{wv} for out-patient care by types of facilities across strata and regions for adults aged 30 years and above, for years 1996, 2006 and 2011. For public facilities, in 1996, the HI_{wv} for out-patient care across Peninsular Malaysia, East Malaysia, urban and rural areas were all negative, indicating that the utilisation for out-patient care after standardising for health needs were concentrated among the poor s. However, these patterns had begun to change in 2006. The HI_{wv} in East Malaysia and urban areas indicates that the utilisations for out-patient care after standardising of health needs were equally distributed across the income-gradient. In 2011, the HI_{wv} in East Malaysia and rural areas indicates that the utilisations for out-patient care after standardising of health need were equally distributed across income-gradient. Meanwhile for Peninsular Malaysia and urban areas, the value of HI_{wv} were negative indicating that the utilisation for out-patient care after standardising of health needs was concentrated among the poor (Figure 14.1).

For private facilities, in 1996, the HI_{wv} across Peninsular Malaysia, urban, and rural areas were positive. These indicate that the utilisation for out-patient care after standardising of health needs were concentrated among the rich. However, this pattern changed in 2006. The HI_{wv} in the urban areas indicates that the out-patient care utilisation after standardising of health needs was equally distributed across income-gradient. For Peninsular Malaysia, East Malaysia and rural areas, the HI_{wv} were all positive which indicate that the utilisations for private out-patient care after standardising for health needs were concentrated among the rich. In 2011, the HI_{wv} in East Malaysia and urban areas indicate that the utilisation for out-patient care after standardising for health needs was equally distributed across

income-gradient. Meanwhile for Peninsular Malaysia and the rural areas, the HI_{wv} were positive, suggesting that that the out-patient care utilisations after standardising for health need were concentrated among the rich (Figure 14.1).

Table 51.1: Average utilisation rate for out-patient care visits, by types of facilities across strata and region for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**(%)[2]**	**Average[1]**	**(%)[2]**	**Average[1]**	**(%)[2]**
Public facilities in Peninsular Malaysia	0.7 (0.6,0.8)		1.4 (1.2,1.5)		2.0 (1.8,2.3)	
Public facilities in East Malaysia	1.6 (1.3,1.8)		0.9 (0.7,1.1)		3.9 (2.4,5.4)	
Public facilities in Urban	0.3 (0.3,0.4)		0.8 (0.7,1.0)		1.8 (1.5,2.1)	
Public facilities in Rural	1.5 (1.3,1.7)		2.0 (1.7,2.3)		3.9 (2.9,4.9)	
Overall Public facilities	1.0 (0.8,1.1)	27.9	1.4 (1.2,1.5)	44.6	2.5 (2.0,2.7)	49.1
Private facilities in Peninsular Malaysia	2.5 (2.4,2.7)		1.6 (1.5,1.7)		2.3 (2.0,2.7)	
Private facilities in East Malaysia	1.6 (1.4,1.9)		1.2 (1.0,1.5)		1.9 (1.4,2.4)	
Private facilities in Urban	2.8 (2.5,3.0)		1.6 (1.4,1.7)		2.5 (2.1,2.5)	
Private facilities in Rural	2.0 (1.8,2.2)		1.5 (1.3,1.7)		1.6 (1.3,1.8)	
Overall Private facilities	2.5 (2.3,2.6)	72.1	1.5 (1.4,1.7)	55.4	2.3 (1.9,2.5)	50.9
Overall Out-Patient Care Utilisation	**3.5 (3.3,3.6)**	**100.0**	**2.9 (2.7,3.1)**	**100.0**	**4.8 (4.3,5.2)**	**100.0**

Note: [1]Average utilisation for out-patient care per capita per annum.
The value in brackets denotes 95 per cent confidence intervals.

Table 52.1: Concentration Index (***C***) for out-patient care visits, by types of facilities across strata and region for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Public facilities in Peninsular Malaysia	-0.208 (-0.284,-0.132)	-0.221 (-0.319,-0.124)	-0.116 (-0.188,-0.043)
Public facilities in East Malaysia	-0.206 (-0.296,-0.116)	-0.099 (-0.246,0.047)	-0.260 (-0.496,-0.024)
Public facilities in Urban	-0.193 (-0.321,-0.066)	-0.108 (-0.207,-0008)	-0.133 (-0.224,-0.042)
Public facilities in Rural	-0.099 (-0.169,-0.029)	-0.101 (-0.205,0.003)	-0.132 (-0.302,0.038)
Overall Public facilities	-0.230 (-0.292,-0.169)	-0.176 (-0.257,-0.095)	-0.190 (-0.296,-0.083)
Private facilities in Peninsular Malaysia	0.134 (0.090,0.177)	0.053 (0.000,0.105)	0.088 (0.014,0.162)
Private facilities in East Malaysia	0.169 (0.083,0.255)	0.116 (0.005,0.227)	0.131 (-0.057,0.320)
Private facilities in Urban	0.103 (0.050,0.156)	0.014 (-0.049,0.078)	0.047 (-0.036,0.130)
Private facilities in Rural	0.166 (0.101,0.230)	0.183 (0.098,0.268)	0.184 (0.051,0.316)
Overall Private facilities	0.145 (0.105,0.185)	0.073 (0.027,0.120)	0.100 (0.032,0.167)
Overall Out-Patient Care Utilisation	**0.036 (0.002,0.069)**	**-0.039 (-0.083,0.004)**	**0.045 (-0.106,0.017)**

Note: *C*: Concentration Index.
The value in brackets denotes 95 per cent confidence intervals.

Table 53.1: Horizontal Inequities Index (HI_{wv}) for out-patient care visits, by types of facilities across strata and region for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Public facilities in Peninsular Malaysia	-0.192 (-0.267,-0.177)	-0.208 (-0.306,-0.110)	-0.112 (-0.183,-0.042)
Public facilities in East Malaysia	-0.215 (-0.308,-0.121)	-0.099 (-0.241,0.042)	-0.217 (-0.472,0.038)
Public facilities in Urban	-0.161 (-0.280,-0.042)	-0.092 (-0.185,0.002)	-0.126 (-0.210,-0.041)
Public facilities in Rural	-0.108 (-0.181,-0.035)	-0.137 (-0.247,-0.026)	-0.139 (-0.322,0.044)
Overall Public facilities	-0.217 (-0.278,-0.156)	-0.169 (-0.249,-0.088)	-0.176 (-0.282,-0.070)
Private facilities in Peninsular Malaysia	0.144 (0.101,0.186)	0.088 (0.035,0.140)	0.092 (0.021,0.164)
Private facilities in East Malaysia	0.189 (0.096,0.282)	0.103 (0.001,0.205)	0.130 (-0.055,0.314)
Private facilities in Urban	0.113 (0.062,0.164)	0.046 (-0.014,0.107)	0.048 (-0.031,0.127)
Private facilities in Rural	0.170 (0.103,0.237)	0.180 (0.090,0.270)	0.192 (0.048,0.335)
Overall Private facilities	0.158 (0.119,0.198)	0.098 (0.052,0.144)	0.110 (0.043,0.176)
Overall Out-Patient Care Utilisation	**0.050 (0.017,0.083)**	**-0.021 (-0.065,0.022)**	**-0.033 (-0.094,0.027)**

Note: **HI_{wv}**: Horizontal Inequity Index.
The value in brackets denotes 95 per cent confidence intervals.

6.4 Summary

This chapter describes the findings distribution of utilisation for out-patient care from the perspective of fairness. The data analyses for this assessment was made at three levels namely, at the average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs. The analyses were conducted among adults aged 30 years old and above, spanning over 15-years period from 1996 to 2011. In general, utilisation for out-patient care services in Malaysia was equitable based upon five important findings. The first finding showed that the access for out-patient care visits was adequate with respect to sex, ethnic groups, employment status and place of residence as in urban/rural, states or region (Peninsular Malaysia and East Malaysia). This is based on the threshold recommended by the GNHE of four out-patient visits per person per year (Global Network for Health Equity, 2015).

Secondly, the income-gradient in healthcare utilisation that was measured by ***C*** showed that the distribution of out-patient care utilisation was equally distributed across the income-gradient in all areas (urban, rural, Peninsular Malaysia and East Malaysia). The distribution of out-patient care utilisation in the urban area and Peninsular Malaysia had improved and became equally distributed across the income-gradient over time. Meanwhile for rural areas and East Malaysia, the distributions remained equally distributed for all the three years, namely, 1996, 2006 and 2011.

The values of HI_{wv} obtained in this study demonstrates that the distributions of out-patient care utilisations after standardising for health need were equally distributed across the income-gradient over time. The distribution of out-patient care utilisation had improved and became equally distributed in the urban areas and Peninsular region. Meanwhile in the rural areas and East Malaysia region, the distribution remained equally distributed across the income-gradient over time. The distributions of HI_{wv} at the state level revealed no significant changes which were mainly equally distributed for all three points in time, namely, 1996, 2006 and 2011.

Public out-patient care facilities in the urban areas and Peninsular region were utilised predominantly by the poor. The private facilities in Peninsular and rural areas were utilised predominantly by the rich. Nevertheless, some features have appeared to reduce the equity status in the urban areas and East Malaysia over time. The distributions of utilisation in private out-patient care in the urban areas and peninsular region were equally distributed across the income gradient, suggesting that some segment of the poorer population have increasingly utilised the private healthcare services. At the same time the distributions of out-patient utilisation in public facilities in rural and East Malaysia region were shown to be equally distributed across the income-gradient, indicating that the richer were also using the public facilities.

CHAPTER 7: DISTRIBUTION OF UTILISATION FOR IN-PATIENT CARE

7.1 Introduction

The objective of this study is to assess fairness of healthcare utilisation for both out-patient and in-patient care in the Malaysian healthcare system. Chapter 7 is focused on in-patient care services. Fairness in healthcare utilisation for in-patient care was also assessed at three levels, namely (i) average utilisation rate (ii) income-gradient in healthcare utilisation and (iii) residual income-gradient in healthcare utilisation after standardising for health needs. These assessments were conducted for the three levels of across the individual characteristics, strata level (urban/rural), regional level (Peninsular Malaysia and East Malaysia) and types of facilities ownership (public and private). The assessment of fairness of healthcare utilisation for in-patient care was made at three points in time over 15-years period from 1996 to 2011. As previously described in chapter 6, the assessment for income-gradient in healthcare utilisation was made using the $\boldsymbol{C}$. Meanwhile, for the residual income-gradient in utilisation that is standardised against health needs was assessed by the HI_{wv}. The HI_{wv} was using the MAMI, which was described in Chapter 5.

This chapter begins with section 7.2 which describes the data source and specification used for the analysis. This section also described the methodology adopted in measuring fair distribution of utilisation for in-patient care. Section 7.3 contain the results of the analysis for distribution of in-

patient care utilisation and it is arranged into sections for individuals level, strata, states, region and type of facilities. The two regions included in this analysis are the Peninsular Malaysia and East Malaysia (Sabah and Sarawak). For strata level, it involved analysis for urban and rural area. This section also examined the distribution of utilisation for in-patient care by different types of hospitals namely public facilities and private facilities. Section 7.4 provides a summary of the overall findings and concludes Chapter Seven.

7.2 Data and Methodology

7.2.1 Data source and specification

The data for analysis were extracted from the nationally representative household health surveys namely – NHMS data (II), (III) and (IV) collected by MOH in 1996, 2006 and 2011 respectively. This data was collected by conducting face-to-face interview of non-institutionalized civilian population in all the 15 states in Malaysia. The information obtained covers a wide range of health variables pertaining to acute and chronic illnesses, injuries, disabilities, and healthcare expenditure.

7.2.2 Concept of Measurement

The fairness in healthcare utilisation for in-patient care was assessed by three levels of assessment namely (i) average utilisation rate, (ii) income-gradient in healthcare utilisation and (iii) residual income-gradient in healthcare utilisation standardised for health needs (HI_{wv}). All these assessments were made with respect to individual characteristics, strata, state and region and types of healthcare facilities.

7.3 Results

7.3.1 Distribution of average utilisation rate and income-gradient in healthcare utilisation for in-patient care, by individual characteristics

Table 54.1 shows the average utilisation rates for in-patient care services by individual characteristics of sex, ethnicity and employment status for 1996, 2006 and 2011. For all the three years namely of 1996, 2006 and 2011, it was observed that female utilised the in-patient care more than the males.

The average utilisation rate for in-patient care for all the ethnic groups Malays, Indian, Other-Bumiputras and Non-citizens were not significantly different in 1996, 2006 and 2011. The Chinese had lower average utilisation rates compared to other ethnic groups in years 1996, 2006 and 2011.

For employment status, workers in the private sector and self-employed individual, had lower average utilisation rate compared to the government employees and other employment status (i.e. the pensioners/retirees (public and private sector), housewives, students and workers in informal sectors) in all the years 1996, 2006 and 2011.

Table 55.1 shows the ***C*** for in-patient care services by individual characteristic of sex, ethnicity and employment status in 1996, 2006 and 2011. In 1996, the in-patient care utilisation was concentrated among the poor for both male and female. In 2006, the in-patient care utilisation was concentrated among the poor for the males but was equally distributed across the income-gradient for females. However in 2011, the in-patient care utilisations for both male and female were equally distributed across the income-gradient, for all the years 1996, 2006 and 2011.

As for ethnicity, in 1996, the in-patient care utilisation for all the ethnic groups except for Other-Bumiputras was equally distributed across the income-gradient. For Other-Bumiputras, utilisation was concentrated among the poor. In 2006, the in-patient care utilisation for all the ethnic groups was equally distributed across the income-gradient. However in 2011, the in-patient care utilisation for all the ethnic groups except for Indian was equally distributed across the income-gradient. The distribution for the in-patient care utilisation for Indian was concentrated among the poor.

For employment status, in year 1996 the in-patient care utilisation for the group "other employment status" (i.e. the pensioners/retirees (public and private sector), housewives, students and workers in informal sectors) and self-employed individuals was concentrated among the poor. However in 2006 and 2011, the distribution for the in-patient care utilisation for all the employment type/status was equally distributed across the income-gradient.

Table 54.1: Average utilisation rate for in-patient care visits, by individual characteristic for adults aged 30 years old and above, for years 1996, 2006 and 2011

		1996		2006		2011	
		Average[1]	Percentage (%)	Average[1]	Percentage (%)	Average[1]	Percentage (%)
Sex	Male	86.3 (77.9,94.6)	34.9	67.7 (60.5,74.9)	44.3	83.5 (69.9,97.1)	38.5
	Female	127.4 (119.1,135.8)	65.1	85.8 (78.0,93.5)	55.7	124.0 (111.1,136.9)	61.5
Ethnicity	Malay	111.0 (102.0,120.1)	49.3	85.5 (78.6,92.4)	52.3	118.4 (103.4,133.4)	53.8
	Chinese	81.2 (71.6,90.7)	22.0	56.2 (46.0,66.4)	20.8	70.8 (57.5,84.2)	22.8
	Indian	143.3 (122.1,164.4)	13.0	131.7 (108.5,154.9)	12.3	163.0 (122.0,204.0)	9.9
	Others Bumiputras	147.0 (128.0,166.1)	10.6	75.6 (60.0,90.7)	9.9	123.3 (92.6,154.0)	9.5
	Others	116.7 (71.0,162.4)	1.4	59.0 (23.2,94.8)	0.6	77.8 (38.3,117.3)	0.5
	Non-Citizen	93.6 (69.8,117.4)	3.7	49.1 (23.2,75.1)	4.1	47.5 (29.4,65.5)	3.5
Employment Status	Government	107.9 (92.0,123.8)	12.3	74.7 (58.8,90.6)	9.3	100.0 (72.3,127.8)	9.2
	Privates	76.9 (67.4,86.5)	20.0	52.9 (45.4,60.4)	22.6	76.6 (62.9,90.2)	25.9
	Self-employed	77.6 (67.2,87.9)	15.8	58.4 (48.4,68.4)	17.8	49.8 (38.1,61.4)	11.8
	Others	146.3 (135.1,157.5)	51.9	107.2 (96.8,117.6)	50.2	158.2 (138.3,178.1)	53.2
Overall In-patient care utilisation		**108.0 (102.1,113.9)**	**100.0**	**76.7 (71.4,82.0)**	**100.0**	**103.4 (94.1,112.8)**	**100.0**

Note: [1]Average number of visits for in-patient care per 1000 population per annum.
The value in brackets denotes 95 per cent confidence intervals.

Table 55.1: Concentration Index (***C***) for in-patient care visits, by individual characteristic for adults aged 30 years old and above, for years 1996, 2006 and 2011

		1996	2006	2011
		C	***C***	***C***
Sex	Male	-0.079 (-0.140,-0.017)	-0.070 (-0.131,-0.009)	-0.041 (-0.140,0.058)
	Female	-0.085 (-0.125,-0.044)	-0.032 (-0.086,0.022)	-0.027 (-0.088,0.033)
Ethnicity	Malay	-0.077 (-0.131,-0.023)	-0.021 (-0.069,0.028)	-0.022 (-0.099,0.054)
	Chinese	-0.068 (-0.160,0.023)	-0.131 (-0.257,-0.005)	0.137 (0.023,0.251)
	Indian	-0.019 (-0.110,0.071)	-0.099 (-0.211,0.014)	-0.170 (-0.332,-0.009)
	Others Bumiputras	-0.103 (-0.182,-0.024)	0.032 (-0.078,0.142)	-0.064 (-0.223,0.094)
	Others	0.135 (-0.051,0.321)	0.048 (-0.230,0.326)	-0.177 (-0.626,0.273)
	Non-Citizen	-0.031 (-0.179,0.117)	0.182 (-0.186,0.551)	0.022 (-0.231,0.274)
Employment Status	Government	0.013 (-0.088,0.115)	0.021 (-0.116,0.158)	0.013 (-0.257,0.284)
	Privates	0.038 (-0.034,0.109)	-0.095 (-0.188,-0.003)	-0.029 (-0.145,0.087)
	Self-employed	-0.112 (-0.192,-0.031)	-0.059 (-0.158,0.040)	0.061 (-0.078,0.200)
	Others	-0.108 (-0.159,-0.057)	0.007 (-0.056,0.070)	-0.014 (-0.087,0.059)

Note: *C*: The Concentration Index of in-patient care utilisation.
The value in brackets denotes 95 per cent confidence intervals.

7.3.2 Distribution of average utilisation rate and income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs, for in-patient care, by urban and rural strata

Table 56.1 shows the average utilisation rate for in-patient care visits by urban and rural strata, in 1996, 2006 and 2011. In 1996, 2006 and 2011, there was no significant difference for the average utilisation rate for in-patient care visits between urban and rural strata (Table 56.1, Figure 15.1).

Table 57.1 shows the ***C*** for in-patient care utilisation by urban and rural strata in 1996, 2006 and 2011. In 1996, the distributions of in-patient care utilisation in the urban and rural areas were concentrated among the poor. In 2006, the distribution of in-patient care utilisation in the rural areas was equally distributed across the income-gradient. In year 2011, the distribution of in-patient care utilisation for both urban and rural areas were equally distributed across the income-gradient (Figure 16.1).

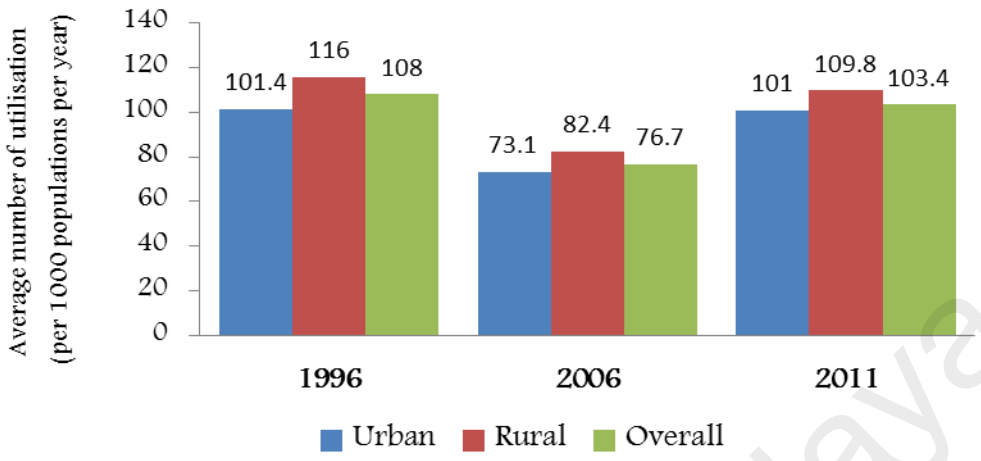


Figure 15.1: Average number of utilisation for in-patient care by urban and rural in 1996, 2006 and 2011

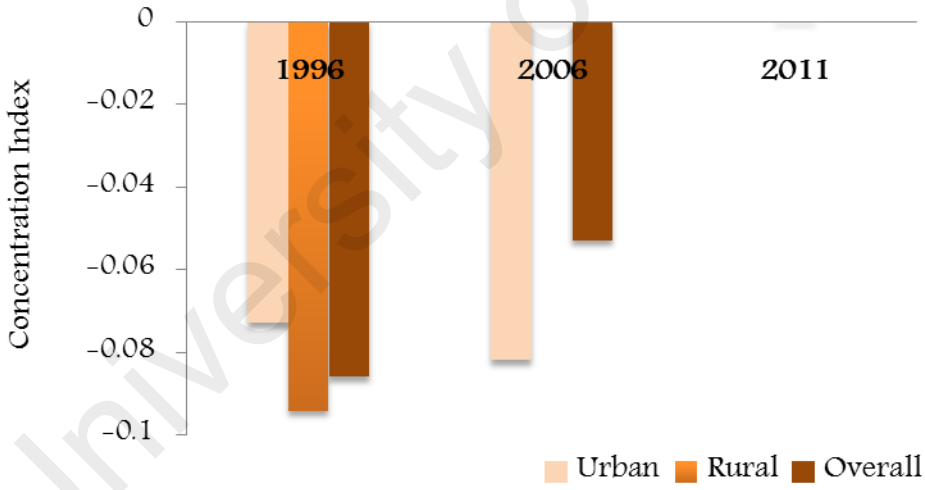


Figure 16.1: Income-related inequity for in-patient care by urban and rural in 1996, 2006 and 2011

Table 58.1 shows the HI_{wv} for in-patient care services, by urban and rural strata in 1996, 2006 and 2011. In 1996, the value for HI_{wv} were negative in both urban and rural areas, indicating that the utilisation for in-patient care services after standardising for health need, were concentrated among the poor. However in 2006, the HI_{wv} for the urban areas became concentrated among the poor while for the rural area, it indicates that the utilisation for in-patient care services after standardising for health need was equally distributed across the income-gradient. In 2011, the HI_{wv} for both urban and rural areas indicates that the healthcare utilisations for the in-patient care after standardising for health need were equally distributed across the income-gradient (Figure 17.1).

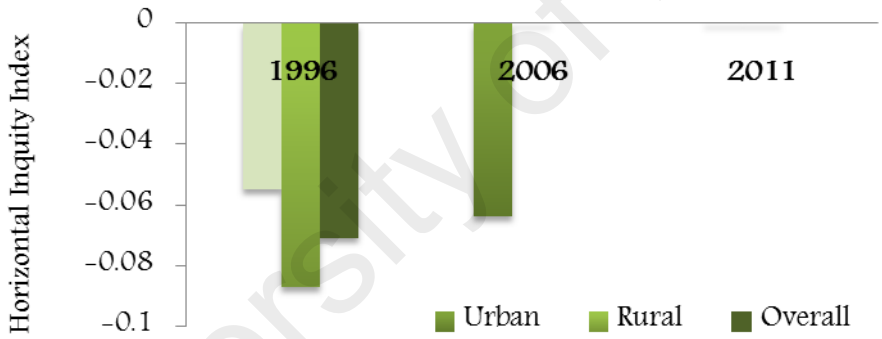


Figure 17.1: HI_{wv} for in-patient care utilisation by urban and rural in 1996, 2006 and 2011

Table 56.1: Average utilisation rate for in-patient care visits, by urban and rural strata for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average[1]**	**Percentage (%)**
Urban	101.4 (93.8,109.0)	52.9	73.1 (66.5,79.7)	60.6	101.0 (89.7,112.3)	73.7
Rural	116.0 (106.7,125.3)	47.1	82.4 (73.6,91.2)	39.4	109.8 (93.0, 126.7)	26.3
Overall	108.0 (102.1,113.9)	100.0	76.7 (71.4,82.0)	100.0	103.4 (94,1,112.8)	100.0

Note: [1]Average utilisation for in-patient care per 1000 population per annum.
The value in bracket denotes confidence interval

Table 57.1: Concentration Index (***C***) for in-patient care visits, by urban and rural strata for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Urban	-0.073 (-0.123,-0.024)	-0.082 (-0.141,-0.023)	-0.025 (-0.094,0.044)
Rural	-0.094 (-0.144,-0.043)	-0.009 (-0.073,0.054)	-0.065 (-0.150,0.020)
Overall	**-0.086 (-0.120,-0.052)**	**-0.053 (-0.093,-0.013)**	**-0.038 (-0.092,0.016)**

Note: ***C*:** Concentration Index
The value in bracket denotes confidence interval.

Table 58.1: Horizontal Inequities Index (HI_{wv}) by urban and rural strata for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Urban	-0.055 (-0.103,-0.007)	-0.064 (-0.122,-0.007)	-0.016 (-0.083,0.052)
Rural	-0.087 (-0.138,-0.036)	-0.014 (-0.081,0.053)	-0.050 (-0.139,0.040)
Overall	**-0.071 (-0.105,-0.037)**	**-0.036 (-0.076,0.040)**	**-0.022 (-0.075,0.031)**

Note: HI_{wv}: Horizontal Inequity Index
The value in bracket denotes confidence interval.

7.3.3 Distribution of average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs, for in-patient care, by state and region

Table 59.1 to Table 64.1 show the average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient healthcare utilisation standardised for health needs, for in-patient care by state and regional in Malaysia, in years 1996, 2006 and 2011.

Table 59.1 and Table 60.1 show the average utilisation rate for in-patient care by state in Peninsular Malaysia and East Malaysia for adults aged 30 years old and above, for years 1996, 2006 and 2011. In 1996 and 2006, the average utilisation rates for in-patient care visits showed no significant difference between all the states in Malaysia. However, in 2011, in Kelantan there were 52.5 (95% CI: 34.3,70.6) in-patients cares per 1000 population per annum, which was lower compared to in-patient care in other states.

Table 59.1 and Table 60.1 also show that there was no significant difference for the average utilisation rate between Peninsular Malaysia and East Malaysia in the year of 1996 and 2011. However in 2006, the average utilisation rate in East Malaysia was lower than in Peninsular Malaysia.

Table 61.1 shows the ***C*** for in-patient care, in Peninsular Malaysia for adults aged 30 years old and above, for years 1996, 2006 and 2011. In 1996, the distribution of ***C*** in all states in Peninsular Malaysia indicates that the in-patient care utilisation was equally distributed across the income-gradient. In 2006, the distribution of ***C*** in all states in Peninsular Malaysia except for Selangor indicates that the in-patient care utilisation was equally distributed across the income-gradient. The distribution of in-patient care utilisation in Selangor was concentrated among the poor. While in 2011, the distribution of ***C*** in all states in Peninsular Malaysia except for Melaka indicates that the distribution of utilisation for the in-patient care was equally distributed across the income-gradient. Melaka that was concentrated among the poor. In general, the distribution for the in-patient care utilisation in Peninsular Malaysia was equally distributed across the income-gradient in 1996, 2006 and 2011.

Table 62.1 shows the ***C*** for in-patient care services in East Malaysia aged adults aged 30 years old and above, for years 1996, 2006 and 2011. The result shows that, in 2006 and 2011, the distribution of in-patient care utilisation in Sabah and Sarawak was equally distributed across the income-gradient, a shift in the pattern from previously concentrated among the poor in 1996.

Table 63.1 and Table 64.1 show the HI_{wv} for in-patient care by state in Peninsular Malaysia and East Malaysia for adults aged 30 years old and above for years 1996, 2006 and 2011. In 1996, the HI_{wv} for all the states in Malaysia excluding Perlis and Sabah indicates that the distribution of in-patient care utilisation after standardising for health need was equally distributed across the income-gradient. Meanwhile for Perlis and Sabah, the in-patient care utilisation after standardising for health need was concentrated among the poor but was equally distributed across the income-gradient in 2006 and 2011. In 2006, the HI_{wv} for all the states in Malaysia excluding Selangor indicates that the distribution of in-patient care utilisation after standardising for health need was equally distributed across the income-gradient. The distribution of in-patient care utilisation after standardising for health need in Selangor was concentrated among the poor. In 2011, the HI_{wv} for all the states in Malaysia excluding Melaka indicates that the distribution of in-patient care utilisation after standardising for health need was equally distributed across the income gradient. The HI_{wv} in Melaka however was concentrated among the poor.

In general, the HI_{wv} in Peninsular Malaysia in 1996, 2006 and 2011 indicates that the in-patient care utilisation after standardising for health need was equally distributed across income-gradient. Similar findings were found in East Malaysia in 2006 and 2011 except in 1996 that was concentrated among the poor.

Table 59.1: Average utilisation rate for in-patient care visits, by states (Malaysia Peninsular) for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average[1]**	**Percentage (%)**
Johor	92.7 (75.1,110.3)	10.4	76.5 (55.8,97.2)	10.6	96.2 (73.6,118.7)	11.6
Kedah	108.9 (86.1,131.8)	7.5	92.6 (71.9,113.4)	8.2	111.7 (65.6,158.0)	7.6
Kelantan	119.9 (94.2,145.7)	7.1	81.9 (60.9,102.8)	6.0	52.5 (34.3,70.6)	3.2
Melaka	102.3 (76.9,127.7)	3.4	78.0 (50.8,105.1)	2.9	106.4 (70.9,141.9)	3.2
Negeri Sembilan	145.6 (116.4,174.7)	5.7	128.0 (94.2,161.8)	5.3	126.0 (94.1,158.0)	5.2
Pahang	131.2 (130.0,159.3)	6.4	104.4 (78.7,130.1)	7.4	86.6 (56.9,116.3)	4.5
Pulau Pinang	112.7 (84.3,141.1)	5.7	70.8 (51.8,89.7)	6.0	128.0 (89.0,166.9)	8.6
Perak	101.8 (82.4,121.2)	10.0	94.0 (75.1,112.9)	10.2	127.8 (85.1,170.6)	9.8
Perlis	187.9 (130.0,245.9)	1.5	43.3 (15.8,70.7)	0.5	68.3 (42.7,93.9)	0.6
Selangor	97.6 (83.7,111.3)	19.3	65.1 (55.7,74.4)	18.8	102.8 (84.8,120.8)	22.2
Terengganu	86.4 (60.8,112.0)	3.0	112.1 (80.8,143.4)	4.3	65.0 (43.9,86.1)	2.4
Kuala Lumpur	83.8 (65.0,102.6)	5.2	68.4 (43.7,93.1)	5.8	131.8 (74.0,189.6)	6.8
Malaysia Peninsular	105.5 (99.0,112.1)	84.8	81.4 (76.3,87.5)	86.0	104.9 (94.5,115.2)	85.7
Total	**108.0 (102.1,113.9)**	**100.0**	**76.7 (71.4,82.0)**	**100.0**	**104.2 (96.1,112.2)**	**100.0**

Note: [1]Average number of visit for in-patient care per 1000 population per annum.
The value in bracket denotes confidence interval.

Table 60.1: Average utilisation rate for in-patient care visits, by states (East Malaysia) for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**Percentage (%)**	**Average[1]**	**Percentage (%)**	**Average[1]**	**Percentage (%)**
Sabah & Labuan	113.0 (96.3,129.7)	7.3	58.8 (46.1,71.4)	7.8	94.0 (68.9,119.0)	7.8
Sarawak	130.4 (109.3,151.6)	7.9	53.9 (39.2,68.6)	6.2	100.0 (62.0,137.9)	6.5
Malaysia East	121.9 (108.4,135.5)	15.2	56.5 (46.9,66.1)	14.0	96.9 (74.4,119.4)	14.3
Total	**108.0 (102.1,113.9)**	**100.0**	**76.7 (71.4,82.0)**	**100.0**	**104.2 (96.1,112.2)**	**100.0**

Note: [1]Average number of visit for in-patient care per 1000 population per annum.
The value in bracket denotes confidence interval.

Table 61.1: Concentration Index (***C***) for in-patient care visits, by states (Peninsular Malaysia) for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Johor	-0.098 (-0.227,0.031)	-0.060 (-0.211,0.091)	-0.100 (-0.255,0.055)
Kedah	0.038 (-0.117,0.193)	-0.041 (-0.149,0.067)	-0.172 (-0.381,0.037)
Kelantan	-0.071 (-0.216,0.074)	-0.126 (-0.266,0.013)	-0.138 (-0.371,0.095)
Melaka	-0.012 (-0.118,0.094)	0.006 (-0.209,0.221)	-0.320 (-0.539,-0.102)
Negeri Sembilan	-0.061 (-0.187,0.065)	0.051 (-0.122,0.223)	0.022 (-0.137,0.182)
Pahang	-0.102 (-0.236,0.033)	-0.121 (-0.295,0.053)	0.089 (-0.115,0.293)
Pulau Pinang	-0.119 (-0.268,0.030)	-0.130 (-0.299,0.039)	-0.086 (-0.237,0.066)
Perak	-0.091 (-0.222,0.040)	-0.022 (-0.123,0.079)	0.017 (-0.220,0.255)
Perlis	-0.141 (-0.305,0.023)	-0.067 (-0.539,0.404)	-0.063 (-0.296,0.171)
Selangor	-0.060 (-0.167,0.048)	-0.185 (-0.293,-0.078)	-0.051 (-0.166,0.063)
Terengganu	-0.023 (-0.192,0.145)	0.088 (-0.127,0.304)	-0.070 (-0.237,0.096)
Kuala Lumpur	-0.171 (-0.365,0.022)	-0.054 (-0.346,0.238)	-0.098 (-0.387,0.192)
Malaysia Peninsular	**-0.076 (-0.116,-0.036)**	**-0.084 (-0.129,-0.039)**	**-0.039 (-0.098,0.021)**

Note: ***C***: Concentration Index.
The value in bracket denotes confidence interval.

Table 62.1: Concentration Index (***C***) for in-patient care visits, by states (East Malaysia) for adults aged 30 years old and above for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Sabah & Labuan	-0.123 (-0.206,-0.040)	-0.077 (-0.178,0.024)	-0.094 (-0.236,0.047)
Sarawak	-0.115 (-0.218,-0.011)	0.119 (-0.112,0.350)	-0.055 (-0.272,0.163)
Malaysia East	**-0.113 (-0.178,-0.048)**	**0.008 (-0.111,0.127)**	**-0.074 (-0.203,0.056)**

Note: ***C***: Concentration Index.
The value in bracket denotes confidence interval.

Table 63.1: Horizontal Inequity Index (HI_{wv}) for in-patient care visits, by states (Peninsular Malaysia) for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Johor	-0.069 (-0.185,0.046)	-0.029 (-0.165,0.107)	-0.065 (-0.237,0.107)
Kedah	0.055 (-0.098,0.207)	-0.044 (-0.166,0.077)	-0.150 (-0.358,0.059)
Kelantan	-0.033 (-0.175,0.109)	-0.135 (-0.280,0.010)	-0.095 (-0.302,0.111)
Melaka	0.012 (-0.086,0.110)	-0.004 (-0.218,0.210)	-0.249 (-0.454,-0.044)
Negeri Sembilan	-0.075 (-0.211,0.060)	0.032 (-0.145,0.209)	0.023 (-0.136,0.181)
Pahang	-0.094 (-0.235,0.046)	-0.137 (-0.312,0.038)	0.066 (-0.127,0.260)
Pulau Pinang	-0.120 (-0.261,0.022)	-0.090 (-0.249,0.068)	-0.068 (-0.195,0.058)
Perak	-0.065 (-0.177,0.046)	-0.017 (-0.119,0.085)	-0.006 (-0.266,0.255)
Perlis	-0.175 (-0.349,-0.001)	-0.135 (-0.686,0.416)	-0.035 (-0.241,0.172)
Selangor	-0.042 (-0.145,0.062)	-0.162 (-0.268,-0.056)	-0.034 (-0.144,0.076)
Terengganu	0.009 (-0.157,0.175)	0.137 (-0.048,0.322)	-0.058 (-0.195,0.079)
Kuala Lumpur	-0.158 (-0.344,0.028)	0.078 (-0.231,0.268)	-0.103 (-0.433,0.228)
Malaysia Peninsular	**-0.059 (-0.098,-0.021)**	**-0.061 (-0.106,-0.015)**	**-0.030 (-0.089,0.029)**

Note: **HI_{wv}**: Horizontal Inequity Index.
The value in bracket denotes confidence interval.

Table 64.1: Horizontal Inequity Index (HI_{wv}) for in-patient care visits, by states (East Malaysia) for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Sabah & Labuan	-0.109 (-0.194,-0.024)	-0.064 (-0.154,0.026)	-0.067 (-0.214,0.080)
Sarawak	-0.105 (-0.211,0.001)	0.097 (-0.132,0.326)	-0.037 (-0.250,0.175)
East Malaysia	-0.104 (-0.172,-0.037)	0.006 (-0.105,0.117)	-0.041 (-0.172,0.090)
Total	**-0.071 (-0.105,-0.037)**	**-0.036 (-0.076,0.004)**	**-0.022 (-0.075,0.031)**

Note: **HI_{wv}**: Horizontal Inequity Index.
The value in bracket denotes confidence interval.

7.3.4 Distribution of average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs, for in-patient care, by public and private facilities

Table 65.1 shows the average utilisation rate for in-patient care, by type of facilities ownership (government and private), across strata and region for adults aged 30 years old and above for years 1996, 2006 and 2011. In general, the overall average utilisation rate for in-patient care services was higher in the public facilities than in private facilities in 1996, 2006 and 2011.

For the public facilities, the average utilisation rate for in-patient care services were higher in the rural areas compared to urban areas in year 1996, 2006 and 2011. The average utilisation rate for the in-patient care were also higher in East Malaysia compared to Peninsular Malaysia in 1996 but in 2006 and 2011, there was no significant difference for the average utilisation rate between the two regions.

For the private facilities, the average utilisation rate for in-patient care services was higher in the urban areas compared to rural areas in year 1996, 2006 and 2011. The average utilisation rate was also higher in Peninsular Malaysia than in East Malaysia in 1996, 2006 and 2011 (Figure 18.1).

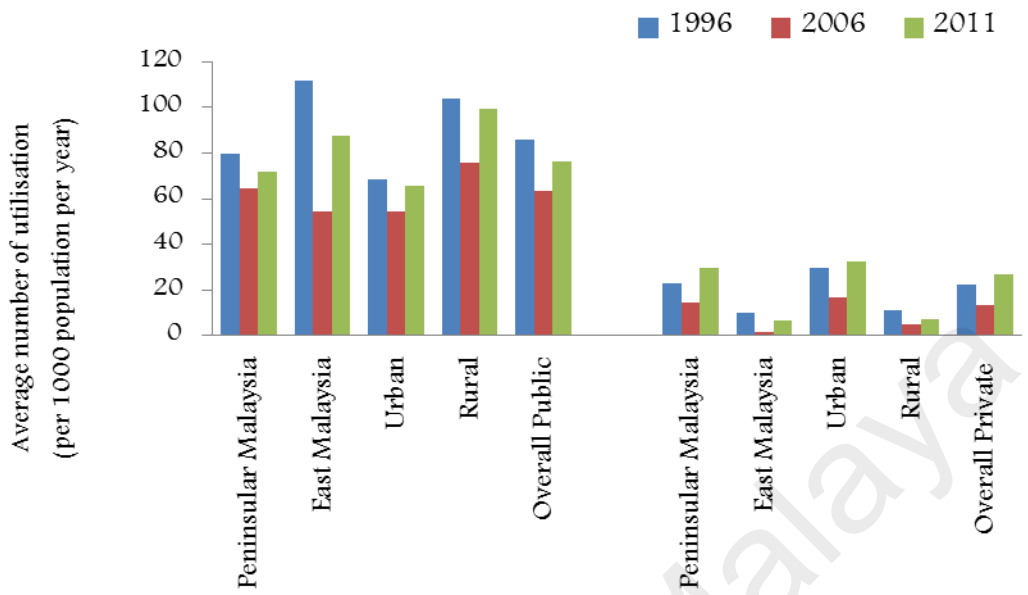


Figure 18.1:Average number of utilisation for in-patient care (per 1000 populations per year) by public and private facilities in Malaysia (1996, 2006, and 2011)

Table 66.1 shows the ***C*** for in-patient care, by types of facilities across strata and region for adults aged 30 years and above for years 1996, 2006 and 2011. For the public facilities, in 1996, the analysis show that the distribution of in-patient utilisation care in Peninsular Malaysia, East Malaysia, urban and rural areas were all concentrated among the poor. However, in 2006, these findings had changed. The distribution of in-patient care utilisations in East Malaysia and rural were equally distributed across the income-gradient. Meanwhile for Peninsular and urban areas, the in-patient care utilisations were still concentrated among the poor. In 2011, the distribution of in-patient care utilisations in Peninsular Malaysia, rural and urban areas were all concentrated among the poor. However for East Malaysia, the distribution of in-patient care utilisation was equally distributed across the income-gradient.

For the private facilities, in 1996, the distribution of in-patient care utilisation in Peninsular Malaysia and urban areas were concentrated among the rich. While for East Malaysia and rural areas, the in-patient care utilisation was equally distributed across the income gradient. However in 2006 and 2011, these findings pattern had changed. The distribution of in-patient care utilisation in all strata and regions were concentrated among the rich (Figure 19.1).

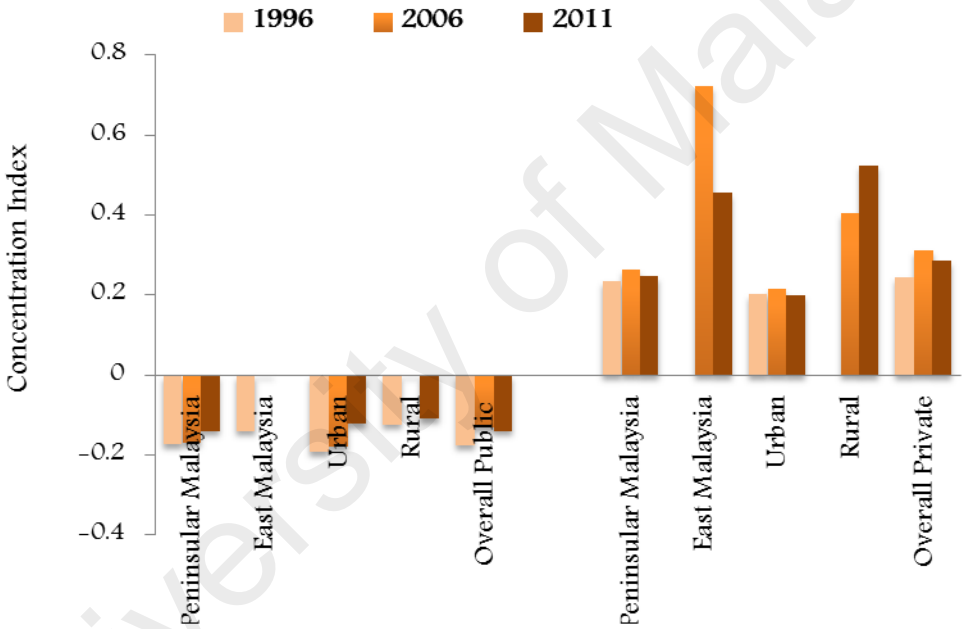


Figure 19.1: Income-related inequality for in-patient care by public and private facilities (1996, 2006, and 2011)

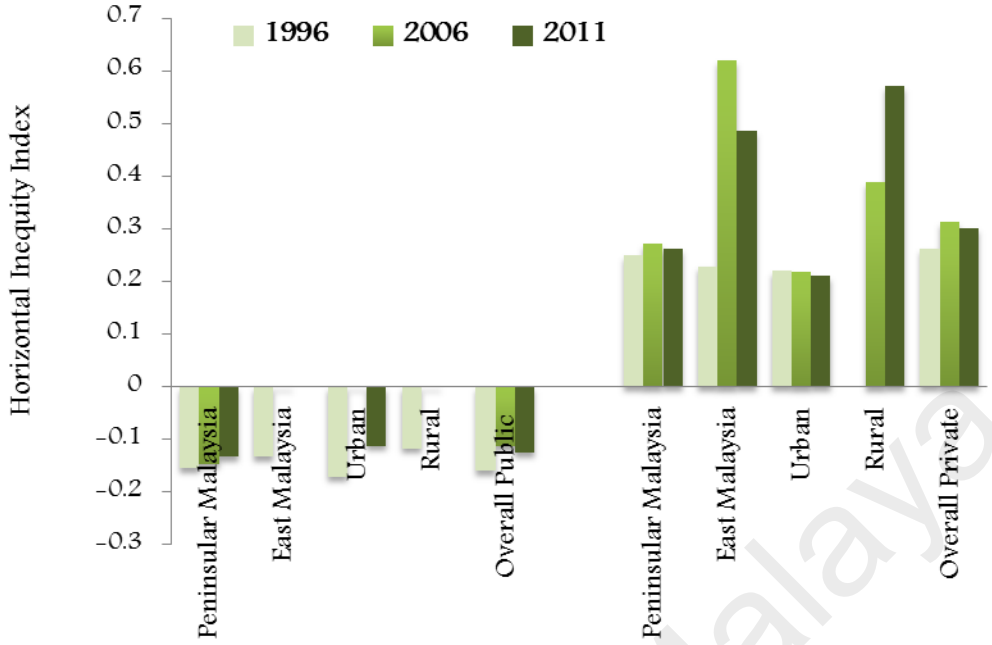


Figure 20.1: HI_{wv} by types of facilities in different strata and region in 1996, 2006 and 2011

Table 67.1 shows the HI_{wv} for in-patient care by type of facilities across strata and region for adults aged 30 years and above for years 1996, 2006 and 2011. For public facilities, in 1996, the HI_{wv} for in-patient care utilisation in Peninsular Malaysia, East Malaysia, urban and rural areas were all negative, indicating that the utilisation for in-patient care after standardising for health needs were concentrated among the poor. However, this trend began to show a changing pattern in 2006. Peninsular Malaysia was still concentrated among the poor while for East Malaysia, urban and rural areas were equally distributed across the income-gradient. In 2011, the HI_{wv} in all regions and strata (urban/rural) eventually became equally distributed across the income-gradient.

For private facilities, in 1996, the HI_{wv} in Peninsular Malaysia, East Malaysia and urban areas were positive. This indicates that the utilisation for in-patient care after standardising for health needs were concentrated among the rich. However, this pattern had begun to change in 2006 and 2011. The HI_{wv} in East Malaysia, Peninsular Malaysia, urban and rural areas were positive, indicating that the in-patient care utilisation after standardising for health needs were concentrated among the rich (Figure 20.1).

Table 65.1: Average utilisation rate for in-patient care visits, by types of facilities across strata and region for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996		2006		2011	
	Average[1]	**(%)[2]**	**Average[1]**	**(%)[2]**	**Average[1]**	**(%)[2]**
Public facilities in Peninsular Malaysia	79.8 (74.1,85.4)		64.5 (59.0,70.0)		72.0 (63.2,80.8)	
Public facilities in East Malaysia	111.6 (98.5,124.7)		54.5 (45.0,64.0)		87.8 (65.9109.8)	
Public facilities in Urban	68.6 (62.3,74.9)		54.4 (48.7,60.0)		65.4 (56.0,74.8)	
Public facilities in Rural	103.8 (95.2,112.4)		75.9 (67.3,84.5)		99.2 (82.8,115.7)	
Overall Public facilities	**85.7 (79.4,89.8)**	**78.2**	**63.5 (57.8,67.4)**	**81.2**	**76.3 (66.6,83.0)**	**71.0**
Private facilities in Peninsular Malaysia	23.2 (20.2,26.1)		14.8 (12.1,17.5)		29.6 (24.6,34.6)	
Private facilities in East Malaysia	10.2 (6.9,13.4)		1.9 (0.5,3.2)		6.5 (2.7,10.3)	
Private facilities in Urban	29.5 (25.6,33.5)		16.8 (13.5,20.1)		32.6 (27.0,38.2)	
Private facilities in Rural	11.2 (8.1,14.3)		5.1 (3.2,7.1)		7.2 (4.2,10.2)	
Overall Private facilities	**22.3 (18.6,23.8)**	**21.8**	**13.2 (10.2,14.5)**	**18.8**	**27.1 (21.4,29.7)**	**29.0**
Overall In-Patient care Utilisation	**108.0 (102.1,113.9)**	**100.0**	**76.7 (71.4,82.0)**	**100.0**	**103.4 (94.1,112.8)**	**100.0**

Note: [1]Average number of visits for in-patient care per 1000 population per year.
The value in bracket denotes confidence interval.

Table 66.1: Concentration Index (***C***) for in-patient care visits, by type of facilities across strata and region for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	**2006**	**2011**
	C	***C***	***C***
Public facilities in Peninsular Malaysia	-0.173 (-0.217,-0.128)	-0.170 (-0.219,-0.121)	-0.139 (-0.212,-0.066)
Public facilities in East Malaysia	-0.139 (-0.208,-0.071)	-0.015 (-0.137,0.106)	-0.131 (-0.270,0.007)
Public facilities in Urban	-0.192 (-0.254,-0.130)	-0.180 (-0.248,-0.113)	-0.122 (-0.211,-0.033)
Public facilities in Rural	-0.123 (-0.174,-0.071)	-0.040 (-0.105,0.026)	-0.109 (-0.200,-0.018)
Overall Public facilities	**-0.175 (-0.212,-0.137)**	**-0.130 (-0.173,-0.087)**	**-0.139 (-0.204,-0.074)**
Private facilities in Peninsular Malaysia	0.236 (0.151,0.321)	0.264 (0.135,0.392)	0.247 (0.150,0.343)
Private facilities in East Malaysia	0.190 (-0.011,0.391)	0.724 (0.116,1.332)	0.455 (0.041,0.870)
Private facilities in Urban	0.202 (0.119,0.284)	0.215 (0.075,0.355)	0.201 (0.102,0.299)
Private facilities in Rural	0.134 (-0.051,0.319)	0.404 (0.095,0.714)	0.525 (0.249,0.801)
Overall Private facilities	**0.245 (0.166,0.324)**	**0.312 (0.187,0.437)**	**0.285 (0.193,0.377)**
Overall In-Patient Care Utilisation	**-0.086 (-0.120,-0.052)**	**-0.053 (-0.093,-0.013)**	**-0.038 (-0.092,0.016)**

Note: ***C*****:** Concentration Index.
The value in bracket denotes confidence interval.

Table 67.1: Horizontal Inequity Index (HI_{wv}) for in-patient care visits, by type of facilities across strata and regional for adults aged 30 years old and above, for years 1996, 2006 and 2011

	1996	2006	2011
	HI_{wv}	**HI_{wv}**	**HI_{wv}**
Public facilities in Peninsular Malaysia	-0.155 (-0.198,-0.111)	-0.146 (-0.195,-0.098)	-0.133 (-0.205,-0.601)
Public facilities in East Malaysia	-0.133 (-0.204,-0.063)	-0.014 (-0.128,0.099)	-0.100 (-0.241,0.040)
Public facilities in Urban	-0.171 (-0.231,-0.111)	-0.159 (-0.223,0.094)	-0.112 (-0.197,-0.026)
Public facilities in Rural	-0.117 (-0.169,-0.064)	-0.044 (-0.113,0.025)	-0.103 (-0.199,0.006)
Overall Public facilities	-0.160 (-0.198,-0.122)	-0.112 (-0.154,-0.069)	-0.125 (-0.189,-0.060)
Private facilities in Peninsular Malaysia	0.249 (0.165,0.334)	0.272 (0.142,0.401)	0.262 (0.166,0.357)
Private facilities in East Malaysia	0.229 (0.016,0.441)	0.620 (0.076,1.164)	0.485 (0.067,0.902)
Private facilities in Urban	0.220 (0.138,0.302)	0.217 (0.079,0.356)	0.210 (0.114,0.307)
Private facilities in Rural	0.145 (-0.049,0.339)	0.388 (0.061,0.714)	0.571 (0.298,0.845)
Overall Private facilities	0.262 (0.183,0.340)	0.312 (0.188,0.437)	0.302 (0.211,0.394)
Overall In-Patient Care Utilisation	-0.071 (-0.105,-0.037)	-0.036 (-0.076,0.004)	-0.022 (-0.075,0.031)

Note: **HI_{wv}**: Horizontal Inequity Index.
The value in bracket denotes confidence interval.

7.4 Summary

Chapter Seven aims to assess the distribution of utilisation for in-patient care services from the perspective of fairness. The assessment was made at three levels which examined the average utilisation rate, income-gradient in healthcare utilisation and residual income-gradient in healthcare utilisation standardised for health needs. The analyses were conducted among the adult aged 30 years old and above, spanning over a period of 15-years from 1996 to 2011. In general, the utilisation for in-patient care services in Malaysia is equitable based on five important findings. The first finding showed that access to the in-patient care services was adequate across the individual characteristics (sex, ethnicity and employment status) except for the Chinese who consistently used less of in-patient care services compared to other ethnic groups. The access for in-patient care services was also adequate in all the different places of residence for urban/rural strata, state and regional (Peninsular Malaysia and East Malaysia) levels.

Secondly, the income-gradient in utilisation that was measured by ***C*** showed that the distribution of in-patient care utilisation in all areas was equally distributed across the income-gradient. The equity status for the in-patient care utilisation in urban/rural, different states and regions (Peninsular Malaysia and East Malaysia) had improved and was observed to be equitable over time.

Thirdly, the values of HI_{wv} demonstrated that the distribution of in-patient care utilisation after standardising for health need was equally distributed across the income-gradient. The distributions of in-patient care utilisations in all areas in urban/rural and different regions (Peninsular Malaysia and East Malaysia) improved and became equally distributed across the income-gradient over time. Meanwhile at the states level, the distributions of HI_{wv} showed no significant changes which were mostly equally distributed across the income-gradient at all three points in time, namely, 1996, 2006 and 2011.

Public in-patient care facilities in the urban areas, rural areas and Peninsular region were utilised exclusively by the poor. On the other hand, the private in-patient care facilities in urban, rural areas, Peninsular Malaysia and East Malaysia were exclusively utilised by the richer. However, some features concerning the equity status in healthcare utilisation had appeared in East Malaysia region. The distribution of in-patient care utilisation in public facilities in East Malaysia has begun to be equally distributed across the income-gradient, indicating that the richer still continued to use the public facilities despite having the financial means for private healthcare.

CHAPTER 8: DISCUSSION & CONCLUSION

8.1 Introduction.

Section two introduces the concept of fundamental freedom as in Article 5.1 of the Malaysian Constitution clearly which state that *"No person shall be deprived of his life or personal liberty saves in accordance with law*". The supremacy of this law has governed the administrative policy and set the direction for the Malaysian government to preserve and protect every citizen's life opportunity which includes guaranteeing a "right to health". This law ensures equal access and utilisation of healthcare for the individual in need, regardless of socioeconomic or geographical disadvantages. This is the path to ensure right to health.

The Malaysian healthcare system has evolved substantially, since the country's' independence in 1957. The health system that began as a public dominated system developed into a dichotomous public and private system and expanded rapidly over the years. The private health sector which did not feature prominently in the country's initial health landscape expanded significantly in response to economic development and increasing public demand. Development of private and public sectors have been guided by differing goals. It is profit driven in the case of the private sector and for the public sector it is welfare based to achieve UHC. This thesis therefore was motivated by the interest to discover the overall picture about the UHC achievement or sustainability in the Malaysian healthcare system especially from the perspective of fairness in healthcare utilisation.

8.2 Summary of framework and methodology

The concept of fairness of healthcare utilisation is basically tied to the concept of distributive justice. This concept is derived from the notion that society has an obligation to ensure that the disadvantaged are protected and has an equal chance to utilise the healthcare services whenever in need. Application of John Rawl's theory of justice as fairness (Rawls, 1957) with Norman Daniels's argument (Daniels, 1981), links together the understanding for delivering healthcare based on health need which ultimately protect life's opportunity. This principle eventually is to ensure that people with equal health need are treated equally regardless of socioeconomic disadvantages and geographical distribution.

The Malaysian Healthcare system has evolved over time. Since achieving independence, Malaysians have enjoyed remarkable improvement in health status. Gradual expansion of the public facilities and delivery of comprehensive healthcare services illustrate the government's commitment and focus on achieving UHC through the public health sector. Expansion of private healthcare sector permitted by the government to encourage participation in the delivery of health services has improved the distribution and accessibility for healthcare services. The existence of a large private sector to a certain extent has impacted the quality of care provided in the parallel public sector in Malaysia. As a result of these circumstances, poorer members of society may have attempted to utilise the private healthcare provider which they perceived as having better quality of care than in the public sector. Those

changes over the years therefore may have impacted the achievement or sustainability of UHC from the perspective of healthcare utilisation.

The government is contemplating to transform the healthcare system. It is therefore judicious to institute an assessment of overall healthcare performance especially if the observed changes to the system will have potential adverse impact to the disadvantaged; such has been the case for Malaysia since the private health sectors have expanded rapidly over the last few decades, especially since 1990. This thesis examined the extent of fairness in healthcare utilisation using three sets of Household Health Survey data-NHMS (II), (III) and (IV) which permitted the evaluation to be conducted at three points in time, namely, 1996, 2006 and 2011. In addition to assessment of healthcare utilisation at the national levels, these data sets also allowed for sub-national assessment namely by strata (urban and rural), regional (Peninsular Malaysia and East Malaysia), state level and the different types of healthcare facilities (public and private). The data sets contained relevant information for fairness analysis with regards to healthcare utilisation for out-patient and in-patient care as well as the measure of household living standard based mainly on individual income.

The MAMI was constructed based on the epidemiological characteristic of the Malaysian adult populations. It contains the properties that reflect the individual's health status which are associated with age, sex, income and employment status thus comparable with the features observe in SAH. SAH has frequently been used in a number of studies on the relationship between

health status and socioeconomic inequalities. However SAH measurement shows significant heterogeneity in relation to income, age, sex, educational level and occupational status. Hence, the health status index like MAMI could provide an option for researchers to assess the socioeconomic inequalities, especially for developing countries like Malaysia with diverse socioeconomic background and significant changes in its disease pattern.

The measurement of living standard was total monthly household income per capita which was derived by standardising the total household income with household size. The equity/fairness evaluation was made at three levels of assessment. The first level of assessment, evaluated the distribution of average of utilisation rate for out-patient and in-patient care. The second level of assessment evaluated the distribution of healthcare use across income which was measured by ***C***. The values of ***C*** range from -1 to 1 where negative values indicate that the distribution of healthcare utilisation is in favour for the poor while a positive value is in favour for the rich. Ultimately, the distribution of healthcare used was assessed by Horizontal Inequity Index (HI_{wv}) where utilisation for the healthcare used were standardised against health need. The value of HI_{wv} range from −2 to 2; where positive values for HI_{wv} indicate horizontal inequities favouring the rich and negative values of HI_{wv} indicate the horizontal inequities favouring the poor.

8.3 Conclusion

This thesis was motivated by the interest to ascertain the fairness in healthcare utilisation over the period from 1996 to 2011 hence, the overall picture about the UHC achievement/sustainability for Malaysian healthcare system.

In general, this study concludes that both the out-patient and in-patient care services utilisation in Malaysia are equitable. This was based upon three enhancing equity findings observed among the adult individual who utilises either the out-patient or in-patient care services at three points in time of the assessment namely 1996, 2006 and 2011. The adult individual in Malaysia has been found to have an adequate level of access to both out-patient and in-patient cares based on the recommended thresholds for out-patient and in-patient care, as stated by the GNHE. In addition to that, the distributions of healthcare utilisation for both out-patient and in-patient care, were equally distributed across income-gradient. The distribution of utilisation for both out-patient and in-patient care, after standardising for health need using the composite index termed MAMI, were also equally distributed across the income-gradient, in different places of residence urban/rural strata, different states, Peninsular and East Malaysia regions. The heavily subsidised public facilities were mainly utilised by the poor especially in rural and East Malaysia, while for the private facilities, it was used by the rich particularly in urban and Peninsular Malaysia.

8.4 Discussion of findings

Over the many decades since its Independence in 1957, Malaysia had undergone rapid economic development accompanied by major social changes. These factors had a major impact on its population growth, demographic composition and changes in disease pattern. The government's continued commitment and prioritization of resources for education, provision of clean water supply, proper sanitation, development of a comprehensive network of healthcare facilities and services, and implementation of effective preventive and control programmes for infectious diseases have resulted in the dramatic reduction in the morbidity and mortality rates in Malaysia.

In this respect, the health status index termed MAMI that was described in Chapter Five, illustrates the individual's health status over the 15 years period from 1996 to 2011. MAMI was constructed based on the epidemiological features of the Malaysian populations. It contains the characteristic that represent the state of the individual's health in which it was shown to be associated with age, sex, and income status and it has been found to be comparable with the features observed in SAH (Wei-Yen L. et al., 2007). The MAMI showed that the percentage of Malaysian adults aged 30 years old and above with multimorbidity had increased by 68.5 percent from 36.2 percent in 1996 to 61.0 per cent in 2011. The rise in MAMI percentage among the adult population aged 30 years old and above is likely due to an increased burden of chronic diseases in Malaysia. This probably emerged from a complex interaction between health, economic growth and demographic changes such as ageing of the Malaysian population, rapidly unplanned urbanization and the

globalization of unhealthy lifestyles. The NHMS that was conducted in 1996, 2006 and 2011 revealed that the prevalence of NCDs such as hypertension, diabetes mellitus, and hyperlipidemia continue to increase over time, despite the effort to control the diseases. Furthermore, high rates of tobacco and alcohol consumption aggravate the NCDs prevalence may have led more individuals to suffer from more than one medical condition or multimorbidity (Bloom, 2011; Lim et al., 2013; Naing C. et al., 2016).

In general, the distribution of MAMI with regards to age, sex, educational status, and BMI is consistent with a number studies in which the MAMI become higher with age factor, higher among females and higher among lower educational level individual (David, 2007; Hopman W. M. et al., 2009; Szklo, 2009). However, the distribution of this index has become equally distributed across the income groups over time, shifting from higher multimorbidity among the lower income groups compared to higher income groups. In addition, the index was also shown to be equally distributed between strata (urban and rural) and regions (Peninsular Malaysia and East Malaysia) over time.

Although the life expectancy of the Malaysian population had increased, the burden of illness among the population had also increased over the years. Over the recent decades more individuals in Malaysia had multimorbidity conditions which may be associated with an increased prevalence of non-communicable diseases such as hypertension, diabetes and asthma. The communicable diseases were previously predominant among the lower

socioeconomic population and were mainly associated with issues of poverty, poor sanitation and underdevelopment. However as the country developed, the prevalence of non-communicable diseases became more prominent. They are mostly related to the process of modernisation and adoption of unhealthy life styles such high consumption of saturated fat diet, smoking, excessive alcohol consumption and sedentary lifestyle. The disease burden became no longer predominant among the lower socioeconomic groups and comparable across all areas in urban, rural, Peninsular Malaysia and East Malaysia

In relation to these changes, a study conducted by Subramanian et.al, (2013) reported that the burden of illness for non-communicable disease is equally distributed across all the income-gradient and in certain instances higher among the well-to-do population. Hence, it is not surprising to note that the distribution of health status index in Malaysia had become equally distributed across urban/rural areas, different regions and different income groups. In addition, the number of healthcare utilisation is expected to increase as individuals with chronic illnesses often need greater use of polypharmacy, spend more on their health and use a greater range of other healthcare services (Cynthia, 2010).

All the above mentioned information is important for designing guidelines and strategies to improve the healthcare services. The healthcare services delivered to the population must therefore be tailored to meet these changes. The allocation of the healthcare resources must take into account the changes in the population health needs and the need to ensure the maintenance of fair

distribution of healthcare services. The technologies for treatment of non-communicable diseases, the healthcare facilities, human resources and drugs must be made available and accessible to the population regardless of their geographical location. The MOH must also be ready to accommodate the large number of patients from the private sector who will gradually migrate/revert from the private sector to the public healthcare facilities due to the high cost of treatment for non-communicable diseases.

For the analyses of the out-patient care services, it was observed that access to out-patient care was adequate at all levels of assessment namely, at the individual level, urban/rural strata level, state level and regional level (Peninsular/ East Malaysia), at all three points in time examined, namely 1996, 2006 and 2011. This conclusion was made after comparing the average utilisation rates in this study guided by the threshold recommended by the GNHE for the out-patient care services utilisation which is four out-patient visits per person per year. Although it is understood that the number of visits may not necessarily reflect the quality of treatment, nevertheless it is noted that such rates are achieved in a number of middle-income countries with good healthcare coverage.

In general, Malaysia has managed to provide a high level of availability of public healthcare services, within a well distributed healthcare delivery system. Evolving from a three-tier model in 1953 to a two tier system in the 1970s, Primary Healthcare (PHC) network in Malaysia has substantially expanded rapidly from just seven health clinics to a total number of 2,878

clinics by 2013 (Table 5.1). The density for both private and public primary clinics increased from 1.7 in year 2000 to 2.09 per 10,000 populations in year 2009 with the highest density being in W.P Kuala Lumpur and the lowest density in Sabah at 1.02 (Table 6.1). As on December 2011, there were 6,589 private medical clinics and 1,576 private dental clinics available in the country. The basic healthcare services in general has been made available to more than 95 per cent of population in Peninsular Malaysia and reaching up to 70 per cent for the population in Sabah and Sarawak by year 2000 (Rasiah R. et al., 2011). The states of Sabah and Sarawak are located on the island of East Malaysia and a large percentage of the population in these two comprises indigenous tribes, who are living in the densely forested interior. The main healthcare provider is the MOH, which provide healthcare services through a network of hospitals, mobile and static clinics. Even so, the patients in both of these two states may still need to travel over long distances to reach these facilities. On the other hand, private clinics were seen to be growing faster in urban areas especially after the late 1980s due to the high demand for better healthcare.

Secondly, the income-gradient in healthcare utilisation for out-patient care, across individual level and place of residence of urban/rural, in different states and regions (Peninsular Malaysia and East Malaysia) has shown that the distribution of out-patient care utilisation was equally distributed across the income-gradient in different places of residence. At the individual level, the distribution of utilisation for out-patient care by sex, ethnic group and employment status, were all shown to be equally distributed across the

income-gradient. This implies that the utilisation for the out-patient care to a certain extent can be assumed was not hindered by the income factor. However, in the urban/rural strata and regional level (Peninsular/East Malaysia), the distribution of out-patient care was equally distributed across the income-gradient, at all the three points in time except in 1996 for the urban areas and Peninsular Malaysia. The distributions of out-patient care in urban areas and peninsular region in 1996 were showed to be concentrated among the richer households. A possible explanation for this finding is that, before the Asian economic crisis in 1997/1998, there was a higher demand for private healthcare services in the urban areas of Peninsular Malaysia, which was triggered by the affluent members of the population. Several states in Peninsular Malaysia especially Kuala Lumpur and Selangor are prosperous states that offer a wide range of employment opportunities especially in the private sector (Yusoff, 2000). The presence of many private employees in these states has encouraged the use of private out-patient care as most of private companies have appointed private clinics as their panel clinic to provide healthcare services for their employees.

Besides extensive job opportunities, higher levels of education are also available in the urban areas like Kuala Lumpur and Selangor. All of these factors contribute to higher use of private healthcare services. The pattern of distribution for different ethnic groups in Malaysia may also explain this. Certain ethnic groups are inclined towards private healthcare services especially the urban population. The Chinese ethnic are known to have the highest living standard and mainly stay in urban areas. The Malays form the

majority ethnic group in the country but mainly reside in the rural areas. Previous studies have shown that the Chinese preferred to use the private healthcare services compared to other ethnic groups. It was found that 80.6 per cent of all clinic visits made by the Chinese were to private clinics as compared to 60.3 per cent for Malays (Ministry of Health, 1997). Apart from the demand by the local population, the growth of private healthcare services in Peninsular and urban areas may also be enhanced by foreign initiated by medical tourism.

The analysis examining public and private sector revealed that, (Table 52.1) for the overall public facilities, it was shown to be concentrated among the poor households. Meanwhile for the private facilities, it was concentrated among the rich households, at all three points in time examined, namely 1996, 2006 and 2011. This implies that poor households predominantly rely on public sector out-patient care services, while for the private facilities were mainly utilised by richer households. These findings to a certain extent, demonstrate the success of the Malaysian government to provide a high level of availability of the healthcare services to the poor/disadvantaged populations and at the same time allowing the richer household members to enjoy the private healthcare services. A similar pattern of out-patient care utilisation for the public and private facilities observed among countries that have successfully achieved UHC by dual healthcare system such as Thailand, South Korea and Chile (Nonthaburi, 2012; Patricia F. et al., 2013; Song, 2009).

Nonetheless in 2006 and 2011, the distribution of utilisation for the public out-patient care in the rural areas, was shown to be equally distributed across the income-gradient. This indicates that the public facilities in the rural areas was not only utilised by the poor households but the rich households as well. The probable explanation for this might be due to the fact that, private facilities are generally limited in the rural areas. This situation has forced the growing number of the rural population with better income, to continue utilising the public out-patient facilities despite having the financial means to seek for private healthcare. Meanwhile for the private healthcare facilities, the distribution of utilisation for out-patient care in 1996 in all areas of Peninsular Malaysia, East Malaysia, urban and rural areas, were concentrated among the rich households initially. However, in 2011, the distribution of utilisation for out-patient care in East Malaysia and the urban areas was equally distributed across the income-gradient. In general, this shows that the poorer populations in the urban areas and in East Malaysia had started to utilise the private healthcare facilities. Several issues such as shorter waiting time and the perception that better quality of care is provided by the private sector may have encouraged even the poor households to utilise the private healthcare services despite the fact that it was beyond their affordability.

Next for the out-patient care analysis, is on the residual income-gradient in healthcare utilisation standardised for health needs (HI_{wv}) in urban/rural strata and in different regions of Peninsular and East Malaysia. The results show that the out-patient care utilisation after standardising for the health need were equally distributed across the income-gradient, in all the years of analysis

except for in 1996 where the distribution of out-patient care utilisation after standardising for the health need was concentrated among the rich households in urban areas and Peninsular region. The possible explanation for this finding as previously discussed is due to the fact that higher demands for private healthcare services occur in peninsular region, predominantly in urban areas. It has been triggered by the affluent members of the population especially from the states of Kuala Lumpur and Selangor that offer a wide range of employment opportunities especially in the private sector. Finally, for public and private facilities, the HI_{wv} were concentrated by the poor households for the public facilities and concentrated by the rich households for the private facilities. This finding shows that the utilisation of out-patient when adjusted for the health need care services, in public facilities were mainly utilised by the poor households while for the private facilities were by the rich households, at three points in time over 15-years period from 1996 to 2011.

For the in-patient care analyses, access for the in-patient care was again shown to be adequate at all levels of assessment namely, individual level, urban/rural level, states level and in different regions (Peninsular/ East Malaysia). This conclusion was again made after comparing the average utilisation rate obtained in this study with the threshold recommended by the GNHE for the in-patient care visits (100 in-patient discharges per 1,000 populations per year). At the individual level, the average utilisation rate for females was always more than men, at all three points in time examined, namely 1996, 2006 and 2011. The number of utilisation for the in-patient care was higher among female due to the fact that the highest cause of admission in MOH

hospitals are pregnancy, childbirth and the puerperium which accounted for about 25.43% (Ministry of Health, 2014a). The in-patient care utilisation among the Chinese ethnic however, always lower than in other ethnic groups. However, this can still be argued if the Chinese are not having an adequate access for the in-patient care. The fact that they are always found healthier (Ministry of Health, 2011b) and having lower fertility rate (Mahari, 2011) compared to other ethnic groups, may explain why the average utilisation rate for the in-patient care services among Chinese were always lower. Similar argument can also be applied to explain the finding for the lower average utilisation rate among the self-employed and private sector worker. This is because majority of the private sector and self-employed workers are also Chinese.

In general, the in-patient care services are still dominated by the government that is delivered through an extensive public facilities network, especially in the rural areas. Starting with only 95 public hospitals for a total number of 23,223 beds in 1990, the number has steadily increased annually whereby by the end of 2013, the total number of public hospitals had increased by 48 per cent with a total of 141 facilities and 39,724 beds (Ministry of Health, 2014a). On the other hand, the number of the private hospitals has also increased over time (Table 9.1). Nonetheless, admission to private hospitals made up only 11.3 per cent of all admissions. The NHMS (II) study in 1996 shows that 50.9 per cent of all admissions to the private hospitals were Chinese (Ministry of Health, 1997). This is in contrast to 24.2 per cent of all Indian admissions, 12.3 per cent of all Malay admissions and 3.5 per cent of all non-Malay

Bumiputras admission. The Chinese preference for private healthcare facilities continued to be observed in 2006 NHMS (III) study where about 28.4 per cent of all Chinese sought care at private hospitals at a much higher rate than Malays (Institute of Public Health, 2008b). Apart from the local demand, the growth of private hospital care in urban areas is also enhanced by the medical tourism industry. Medical tourism has grown significantly in the last 10-15 years and according to the World Travel & Tourism Council (WTTC), medical tourism contributed 9 per cent of global GDP (more than USD 6 Trillion) in 2011. Selangor and Kuala Lumpur are located in a strategic position which gives these states an advantage for medical tourism industry to grow faster compared to other states. Out of 71 private panel health tourism hospitals promoted by MHTC, 20 are located in Selangor and 22 in Kuala Lumpur and the revenue generated from this industry is estimated to increase continuously at least 30 per cent annually up to year 2020.

Secondly, assessment on income-gradient in healthcare utilisation for in-patient care, across individual level and place of residence by urban/rural strata, in different states and in different regions (Peninsular Malaysia and East Malaysia), showed that the distribution of utilisation for the in-patient care was equally distributed across the income-gradient. This finding again as discussed for the out-patient care shows that the utilisation of the in-patient care to a certain extent was also not hindered by the income factor. However, in 1996, the distribution for the in-patient care utilisation in urban and rural areas was concentrated among the poorer households before it became equally distributed across the income-gradient in 2006 and 2011. A possible

explanation for this finding might be due to the fact that, the poorer population has always experience a higher burden of illness especially for communicable diseases. At the same time, higher fertility rates have always been reported among the lower socioeconomic status compared to the higher income group. Combination for both factors could explain why the the distribution for the in-patient care utilisation in urban and rural areas was initially concentrated among the poor households in 1996. However, as the country progressed and the disease pattern of the country started to change, the distribution for the in-patient care utilisation in urban and rural areas was eventually turned to be equally distributed across the income-gradient. This might be due again to changes in distribution of disease burden with respect to socio-economic status. Unlike the communicable disease that is more preponderant among the lower socioeconomic status (Blakely, 2004), the burden of illness for non-communicable disease in several studies, has been reported to be equally distributed across all the income-gradient or in certain instances higher among the better off (Subramaniam SV. et al, 2013). At the same time, the fertility rate may have equally dropped across the entire socioeconomic group thus resulting in equal distribution of in-patient care utilisation across the income-gradient in 2006 and 2011 analysis (Department of Statistics Malaysia, 2013b).

For the analysis involving public and private ownership (Table 66.1), the distribution of in-patient care utilisation for overall public facilities was concentrated among the poor households and for the private facilities, was concentrated among the rich households. This indicates that the public in-

patient services care were utilised by the poor households while for private facilities, it was the rich households. As previously discussed for the analysis of the out-patient care, the in-patient care utilisation to some extent may demonstrate the success of the Malaysian government in fulfilling its social obligation to provide healthcare services to the poor/disadvantaged population. The heavily subsidised public facilities has been used mainly by the poor households especially those in the rural areas.

However, in 2006, the in-patient care utilisation was equally distributed across the income-gradient in urban areas and in East Malaysia. This indicates that in 2006, the rich in urban areas and in the states of Sabah and Sarawak had utilised the public in-patient care services. The possible explanation may be due to the economic crisis that occurred in 1997/1998. The entrepreneurs and private sector workers were affected by the economic crisis had to resort to the government healthcare facilities to obtain healthcare. However in 2011, the distribution of in-patient care utilisation reverted back to be concentrated among the poor households except for East Malaysia. The reason for this observation might be due to the fact that, private facilities are generally limited in Sabah and Sarawak especially in the rural area. This has indirectly forced the well-off population in these two states to continue utilising the public in-patient care services despite having the financial means to use the private healthcare services. On the other hand, for the private facilities, the distribution of in-patient care utilisation in urban/rural strata and Peninsular Malaysia and East Malaysia regions seemed to be concentrated among the rich households over time. In general, this finding shows that the private in-patient

care services are exclusively utilised by the rich households. Due to the fact that the highest source of payment for the private healthcare services in Malaysia is out-of-pocket, this may have restricted the poor households from using the in-patient care services that is known to be very costly.

As for residual income-gradient in healthcare utilisation after standardising of health needs (HI_{wv}), the HI_{wv} of in-patient care in urban and rural areas were equally distributed across the income-gradient, except in 1996. The HI_{wv} for urban and rural areas were concentrated among the poor. However it became equally distributed across the income-gradient over time. This indicates that the distribution of in-patient care utilisation after standardising for health need was equally distributed across the income-gradient, at two points in time examined, namely 2006 and 2011. Meanwhile, in 1996, the distribution of in-patient care utilisation in urban areas and Peninsular Malaysia was concentrated among the poor households. This may be due to the fact that higher prevalence for communicable diseases and fertility rate were always found among the lower socio-economic groups, especially in 1996. However in 2006 and 2011, the disease pattern had changed with increasing prevalence of non-communicable and there was more or less equally distributed across all the income-gradient.

For the analysis involving different types of facility ownership public and private facilities, the utilisation of the in-patient services was concentrated among the poor for the public facilities and concentrated among the rich for the private facilities, when the in-patient care utilisation was adjusted for the

health need, across the income-gradient. This, in general, can be regarded as positive findings. This is because the public in-patient care facilities deal mainly with a large number of cases pertaining to deliveries, pregnancy complications, acute emergencies and accident/trauma cases, while in private hospitals; the treatment includes the management for chronic cases, rehabilitation, and elective surgical cases. The doctor to staff ratio in the public facilities was 7.5 times higher than in the private sector and about half of the supporting staff in the public sector had received formal training compared to those in the private sector which are not trained, especially in preventive care (Aljunid, 1996). This scenario shows that the poor or disadvantaged populations are obtaining all the important care from the public facilities which are heavily subsidised by the government, while for rich, the private healthcare services are preferred over public due to more flexible operating hours, shorter waiting time and comfortable environment and the private healthcare services mainly deals with chronic and elective surgical cases.

8.5 Policy message for Malaysia

This study shows that the Malaysia healthcare system has managed to ensure fairness in health care utilisation for both the out-patient and in-patient care despite growing presence of the private health provider, over time. In the sense that the public healthcare services are affordable, inexpensive, comprehensive and well-distributed to all the population has become the safety net for the poor/disadvantaged population. In this respect, the government need to maintain the affordable comprehensive public healthcare services and accessible to all segment of the population in urban/rural areas and in different regions. At the same time, the quality of public healthcare services need to be examined as the public health services has frequently been perceived to be of lower quality than in the private setting and this has encouraged the lower segments of socio-income group of the population to use the private healthcare services though they cannot effort it (Hoang Van Minh et al, 2014). Part of the deterioration in the quality of the public healthcare services is related to the migration of higher level of skilled healthcare professionals to the private sector due to monetary reasons and facilitated by the government policies to enhance the private sector involvement and role in economic growth such as in health tourism.

Furthermore, assumption by the public that the government is always obligated to provide all sort of services using the recent treatment, drugs and technologies has over-stretched the MOH budget. As a result, some of the new developed institutions are running at the lowest capacity in term of resources that finally compromised the quality of care. Until there are specific policies

with regards to private sector involvement in Malaysian healthcare and a general consensus to the scope and content of public healthcare services to be made universally available to all the population inevitably it will affect the quality of public healthcare services which will continue to deteriorate and eventually corrode the UHC sustainability.

8.6 Policy message for other countries

Findings from this study provide some guidance for policy makers in other countries concerning the possibilities of achieving equity in healthcare utilisation through a dichotomous healthcare system. There are two main policy implications for such countries.

Firstly, the extensive public healthcare facilities that are heavily subsidised by general taxation may progress to equitable utilisation for both out-patient and in-patient care across different strata and regions in the country. The poor and disadvantaged groups of people such as in rural areas will benefit from the healthcare services of the extensive public facilities network thus reducing the disparities between rural/ urban and different regions. The strong commitment by the government that started from the beginning until now, show the importance of government stewardship to achieve equity in healthcare utilisation. Nevertheless, in the sense that the public facilities are always expected to provide all sorts of services regardless of its cost, this has increased the government's financial burden over time. Until there is a general consensus with regard to the scope and content of public healthcare package of services to be made universally available, it will be inevitable that the increasingly well informed Malaysian society will demand for more subsidised healthcare services although it is beyond the government's affordability.

Secondly, the presences of private healthcare facilities may not necessarily produce a negative impact on equity status in healthcare utilisation if the affordable public healthcare services are available for the poor. The presence of private healthcare services in a way can be seen as complementing the role of public health facilities i.e. by encouraging the well-off population to utilise the private facilities thus reducing the burden on the public facilities, especially in the urban areas. Comparative quality of care between public and private sectors has not been extensively studied from the aspect of technical quality of care. However, anecdotally reasons for public demand for private care included better hospitality and timeliness in service delivery. Nonetheless, the uncontrolled growth of the private sector may lead to mal-distribution of healthcare resources favouring urban areas and aggravated by the migration of healthcare professionals from the public to private sector and similar concerns have been enunciated by other countries with dual healthcare system such as in Thailand, Chile and South Korea (Minh H.V. et al, 2014; Patricia F. et al., 2013; Song, 2009).

However, development of the private sector in Malaysia can still be accepted as a healthy progression of a health system growth provided that the right health system structures are in place to ensure that equity of access to care is preserved and costs are effectively managed. As Malaysia is heading its aspiration toward UHC and expanding access to the disadvantaged population, the approach of engaging with the private sector through smart Public-Private Partnership (PPP) may become important option to achieve this goal. This will require genuine partnerships that play to the strengths of each partner both

public and private, in developing and delivering the healthcare services. Clearly, it is time to stop viewing the health market as purely 'public sector', and recognize its mix of public and private provision. The reality however is that the level of engagement with the private sector in Malaysia is minimal, and more needs to be done to bring private players into the healthcare discourse. Nevertheless, all this effort will be futile unless the government is ready to enhance the protection from financial risk that undermines the demand for private care services by increasing health insurance coverage and reduce the OOP (Jean-Claude, July 2013; Stallworthy et al., 2014).

8.7 Limitation of the study and future research direction

This study on fairness in healthcare utilisation was made on the assumption that healthcare utilisation is based on the number or frequency of contacts with the healthcare facilities. This can be debated since the total number or frequency of contacts with healthcare facilities do not necessarily reflect the multi-dimensional aspect of the healthcare treatment given to every individual. This is because the number or frequency of contacts fails to address the quality aspect of healthcare treatment namely from the perspective of continuity, comprehensiveness and productivity of the care (Da-Silva, 2011).

The analysis was only confined to the population aged 30 and above. Therefore, the assumption that Malaysia has achieved the fairness in healthcare utilisation can still be argued. However, given to the fact that more than 60 percent of the utilisation for both out-patient and in-patient care services happened among those population (author's own estimation from the data set), justified the assumption why an overall achievement of fairness in healthcare utilisation in Malaysian was drawn based on that group of population.

Thirdly, the choice of measurement of living standard used for the analysis was income. Income is known to be a poor proxy measurement for the living standard for a developing country like Malaysia, but other measurements such as the expenditure or consumption was not available for use in all the three NHMS data sets. Nevertheless, this analysis did not arbitrarily use the

individual's income but the total household income per capita was used as a proxy for the measurement of the living standard.

The assessment of fair utilisation for both out-patient and in-patient care was made after standardising the utilisation against health need that mainly focused on curative need, represented by the composite index called MAMI. This standardisation, therefore, might not necessarily hold true as the utilisation of the healthcare services is always a result from mixed components of preventive, curative or rehabilitative health need. The number of variables that are used to construct the MAMI was limited. This is due several reasons such as the quality of data, incomparability between all the three datasets, and multicollinearity issues.

The understanding of the entire picture about UHC in Malaysia can be enhanced further by analysing all components of care to include curative, preventive and rehabilitative aspects as well as the overall Malaysian health status across every strata and regions in Malaysia. In addition, an issue with regards to unmet needs must also be addressed. The unmet need has been identified as a critical indicator of access problem as they may result from limited availability or unavailability of healthcare services. However, even if healthcare is available, the people may still not use the services due to cultural and language barriers, stigma or lack of awareness of their own medical condition.

Finally, a truly equitable health system is not only based on the assumptions of equitable utilisation of healthcare services according to health need and payment for the care based on affordability, but should ultimately reduce the gap of the health status differences among the various socioeconomic groups across the strata and regions in this country.

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APPENDICES

PRESENTATION

Conference presentation

1. Equity in Healthcare Utilisation in Malaysia 1996-2006. 7th World Congress on Health Economics (IHEA), July 7-10, 2013 Sydney, Australia