MALAYSIA HEALTH SYSTEMS RESEARCH
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Contextual Analysis of the Malaysian Health System, March 2016

HARVARD
T.H. CHAN
SCHOOL OF PUBLIC HEALTH

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Glossary of Acronyms

AMI	Acute Myocardial Infarction
BMI	Body Mass Index
BPKK	Family Health Development Division / Bahagian Perkembangan Kesihatatan Keluarga
CABG	Coronary Artery Bypass Grafting
CD	Communicable Disease
CKAPS	Private Medical Practice Control Section / Cawangan Kawalan Amalan Perubatan Swasta
COPD	Chronic Obstructive Pulmonary Disease
CRC	Clinical Research Center
CRVS	Civil Registration and Vital Statistics Systems
CT	Computerized Tomography
DALY	Disability Adjusted Life Year
DDD	Defined Daily Dose
DDG	Deputy Director General
DM	Diabetes Mellitus
DMFT	Decayed, Missing, and Filled Teeth
DOSM	Department of Statistics Malaysia
ECG	Electrocardiogram
ECHI	European Community Health Indicators
EMR	Electronic Medical Record
EPF	Employees Provident Fund
FMS	Family Medicine Specialists
FOMEMA	Foreign Workers Medical Examination Monitoring Agency
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GP	General Practitioner
HCL	Hypercholesterolemia
HE	Health Expenditure
HeIS	Health Information System
HIC	Health Informatics Center

HIMS	Health Information Management System
HMO	Health Maintenance Organization
HoIS	Hospital Information Systems
HRH	Human Resources for Health
HRMIS	Human Resource Management Information System
HTN	Hypertension
ICU	Implementation Coordination Unit
IHM	Institute for Health Management
IHME	Institute for Health Metrics and Evaluation
IMR	Institute for Medical Research
IRP	International Reference Price
IT	Information Technology
JPA	Civil Servants Pensions and Salaries
KK	Health Clinic
KOSPEN	Healthy Communities Make a Strong Country
KPI	Key Performance Indicator
MCH	Maternal and Child Health
MCO	Managed Care Organization
MHSR	Malaysia Health Systems Research
MNHA	Malaysian National Health Accounts
MNN	Maternal, Neonatal, and Nutritional Conditions
MOH	Ministry of Health
MO	Medical Officer
MQA	Malaysian Qualifications Agency
MRI	Magnetic Resonance Imaging
MyHDW	Malaysian Health Data Warehouse
MyHIX	Health Information Exchange
N/A	Not Available
NCD	Non-Communicable Disease
NGO	Non-Governmental Organization
NHEWS	National Healthcare Establishment and Workforce Survey
NHMS	National Health and Morbidity Survey

NMCS	National Medical Care Survey
OECD	Organization for Economic Co-operation and Development
OHCIS	Oral Health Clinical Information System
PCI	Percutaneous Coronary Intervention
PHC	Primary Health Care
PHCS	Public Health Costing Study
PHI	Private Health Insurance
PHIS	Pharmaceutical Information System
PRIS	Patient Registry Information System
Q	Quintile
QUALICOPC	Quality and Costs of Primary Care in Europe
R&D	Research and Development
RR	Relative Risk
SE	Standard Error
SHA	System of Health Accounts
SMRP	Medical Care Information System / Sistem Maklumat Rawatan Perubatan
SOCSO	Social Security Organization
SPIKPA	Health Insurance Coverage Scheme for Foreign Workers
STHC	Secondary and Tertiary Health Care
THE	Total Health Expenditure
TPA	Third Party Administrator
TPC	Tele-Primary Care
TPPA	Trans-Pacific Partnership Agreement
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UN	United Nations
WC	Waist Circumference
WDI	World Development Indicators
WHO	World Health Organization
YLD	Years Lived with Disability

Executive Summary

1. Introduction

Malaysia Health Systems Research (MHSR) is a collaboration involving the Government of Malaysia and Harvard University. The project aims to support the Ministry of Health (MOH) and other government agencies in Malaysia as they seek options to strengthen the Malaysian health system—transforming health system functions such as governance, financing, and service delivery in an equitable, efficient, effective, and responsive manner to improve health outcomes, financial risk protection, and user satisfaction.

This report represents the final deliverable for Phase I of MHSR, which has focused on producing a comprehensive, rigorous, and evidence-based analysis of the Malaysian health system. The results of the analysis have been used to develop a set of reform recommendations for policymakers to consider.

The analysis contained in this report has been carried out through a collaborative effort between the Harvard Senior Advisory Team and a team of senior officials, researchers, and analysts in the Ministry of Health and related agencies. The study uses the Harvard framework for health system analysis and reform, which entails an iterative process of: (i) assessing health system performance according to final and intermediate outcomes; (ii) diagnosing causal factors underlying performance problems; and (iii) identifying reforms that strengthen health system governance, financing, service delivery, and payments in order to address these causal factors. The results of the analysis (steps [i] and [ii]) are summarized below.

2. Health System Performance: Ultimate Outcomes

2.1. Population Health Outcomes

Since independence, the Malaysian health system has achieved remarkable outcomes in improving the health status of the population. Most notably, life expectancy at birth—which was already high for a developing country—has increased by more than 10 years. This increase in life expectancy has been driven by rapid declines in infant, child, and maternal mortality. Outcomes for once common communicable diseases, such as malaria, have also improved considerably. Among middle-income countries, Malaysia performs better than average on these measures. However, over the past 15 years, the declines in maternal and child mortality rates have plateaued, with no further notable improvement.

At the same time, Malaysia has performed less well compared to middle- and high-income comparator countries in improving life expectancy of the adult population. This relatively sluggish improvement in adult life expectancy reflects a high and growing burden of non-communicable diseases (NCDs), which the health system has not been able to

adequately manage with its existing design and resources.

It is important to note that while overall health outcomes have been improving for all segments of Malaysian society, there are persistent inequalities related to ethnicity and socioeconomic status. Chinese Malaysians consistently achieve better health outcomes—both in terms of morbidity and mortality—compared to Malays, other Bumiputera, and Indian Malaysians.

2.2. Financial Risk Protection

A key strength of the Malaysian health system is its success in providing broad and meaningful protection from the financial risks associated with the high cost of health care. This undoubtedly important success is achieved through a geographically widespread public delivery system, which offers equitable and universal access to a wide range of services at minimal out-of-pocket cost. Reflecting this strong financial protection, the incidences of catastrophic and impoverishing health expenditures in Malaysia are among the lowest observed among all middle-income countries worldwide. While out-of-pocket spending contributes a considerable share of health financing in Malaysia (36 percent), the fact that all citizens have the option to seek highly subsidized care in the public sector means that this out-of-pocket spending does not translate into financial risk for the population using health services. Nonetheless, out-of-pocket expenditures are a suboptimal source of financing for health care because they do not achieve the benefits (both in terms of economies and financial risk protection) of pooled financing.

2.3. User Satisfaction

Malaysia's universal, low cost health system is greatly valued by the population. Both national surveys, such as the National Health and Morbidity Survey (NHMS), and user exit surveys indicate high levels of satisfaction with both public and private services. However, there are aspects of the system that people are less satisfied with, including process-related quality (such as waiting times, availability of a private room, or choice of doctor) in the public sector, and the cost of healthcare services in the private sector. As incomes rise and expectations grow, dissatisfaction with the levels of service quality offered in the government system is likely to increase.

3. Health System Performance: Intermediate Outcomes

3.1. Access and Utilization

Malaysia's mixed healthcare delivery system, which includes government and private healthcare providers, ensures reasonable levels of physical access to healthcare services for the majority of the population. Nonetheless, some gaps exist—especially for more technologically advanced services and comprehensive primary care. Private providers—which make up 69 percent of outpatient clinics and 26 percent of acute hospital beds—tend to cluster in urban areas. Furthermore, government health expenditures are also not evenly distributed across states. Together, these two factors contribute to an overall distribution of health care resources that is skewed toward more densely populated regions.

Utilization of healthcare services in Malaysia remains

relatively low compared to the rates of utilization seen in most high-income countries (an income status Malaysia aspires to), although the level of admissions is comparable to rates seen in some high-income countries, despite Malaysia's younger population. As Malaysia develops further, utilization will likely increase, putting pressure on the capacity of the health system and increasing expenditures.

Patterns of public and private utilization are influenced by socioeconomic status, with richer Malaysians more likely to seek care in the private sector. Nonetheless, even the poor receive a substantial share of care—particularly outpatient care—from private healthcare providers.

3.2. Quality: Effectiveness and Comprehensiveness of Care

Analyses conducted as part of MHSR indicate that the quality of care delivered in both public and private healthcare facilities in Malaysia is good.

On technical measures of clinical quality (for example, whether the correct medicine was prescribed and appropriate advice given), public clinics slightly outperformed private clinics. However, the health system performs less well in providing comprehensive care that meets the full health needs of the population given the evolving burden of disease and ageing population. This is especially true for management of NCDs. Failure at the population level to effectively diagnose and manage NCDs in both public and private outpatient settings, and suboptimal continuity of care between primary, secondary, and tertiary levels have contributed to high rates of admissions due to chronic conditions such as asthma and diabetes mellitus. Around 15–20 percent of hospital admissions are for conditions that should be effectively managed through ambulatory care, reflecting suboptimal performance of the health system as a whole, with implications for health outcomes as well as efficiency.

3.3. Quality: Responsiveness

Responsiveness refers to the degree to which healthcare services meet the needs and expectations of patients in a 'patient-centered' manner. While Malaysians perceive the overall quality of care in both the public and private sectors to be high, aspects of the patient experience could be improved. For example, many citizens are dissatisfied with the lack of provider choice offered in the public sector, and most patients at public clinics do not have a regular doctor whom they consult for their healthcare needs. Waiting times and limited hours are also a source of dissatisfaction, and impose high opportunity costs on patients accessing care in the public sector. These factors may discourage patients from seeking care when they do not face an acute need, a pattern which is observed in the analysis of service utilization.

3.4. Efficiency

Efficiency of a health system can be evaluated along multiple dimensions. In terms of macro-level efficiency, the Malaysian health system achieves slightly better than average health outcomes relative to its income level and health spending, which—at 4.0 percent of Gross Domestic Product (GDP)—is still relatively low compared with other middle- and high-income countries.

However, in terms of allocative efficiency—whether resources are directed to the right mix of activities in the health system to produce the best possible outcomes—Malaysia could make improvements. In particular, there is a growing trend toward excessive spending on secondary and tertiary care services relative to primary care, a pattern which likely contributes to higher costs and worse health outcomes. Furthermore, almost no resources are devoted to long-term care in Malaysia, and there is evidence suggesting that the resulting burden of long-term care falls on secondary care facilities, at a high cost to the system. Analyses are ongoing to assess the technical efficiency of the Malaysian system—whether outputs are produced at the lowest possible cost. The MHSR preliminary analysis suggests that the degree of technical efficiency varies across types of facilities in the public sector, indicating potential for improvement.

4. Emerging Opportunities and Challenges

4.1. Demographic and Epidemiological Transitions

Although Malaysia's health system has remained remarkably stable over the past five decades, the broader context has changed dramatically. By 2020, Malaysia will be an 'ageing' society, with seven percent of the population aged 65 years or older, and will progress soon after to an 'aged' society, with 14 percent of the population aged 65 or older. Similarly, urbanization has taken place remarkably rapidly, with profound effects on the health and wellbeing of Malaysian society.

These demographic transitions have contributed to another rising trend: the increasing prevalence of NCDs. While in 1990, NCDs accounted for 60 percent of the burden of disease in Malaysia, as measured by Disability Adjusted Life Years (DALYs) lost due to premature death and morbidity, by 2013 this share had increased to 72 percent. Over the nine-year period from 2006 to 2015, adult prevalence of diabetes mellitus increased more than 50 percent (from 11.6 percent to 17.5 percent of the population aged 18 years or older), while the prevalence of hypercholesterolemia more than doubled (from 22.9 percent to 47.7 percent). The prevalence of hypertension, which fell from 37.7 percent in 2006 to 30.3 percent in 2015, is still high by international standards. Moreover—and of particular concern for the future burden of NCDs—98 percent of adults have at least one risk factor for NCDs (such as smoking, unhealthy diet, or physical inactivity), and a large proportion of the population has multiple risk factors. These high risk levels suggest that the NCD burden will likely remain high in the future, with consequences for health outcomes as well as health system costs.

4.2. Cost Growth

Malaysia's healthcare spending, while still relatively low both in absolute terms (US$ 938 in purchasing power parity terms in 2013) and as a share of GDP (4.0 percent in 2013), has been rising over time. Less than 20 years ago, in 1997, health expenditures were only 2.7 percent of GDP. Technological change, rising incomes, and demographic and epidemiological change all contribute to increasing costs and expenditures. These pressures will continue to grow in future, fur-

ther increasing expenditures. While changes to service delivery and financing mechanisms can allay these pressures to some degree, it is inevitable that spending on health care will continue to increase.

4.3. Opportunities

The growing private healthcare sector in Malaysia also presents important opportunities. Health care is a dynamic sector of the economy. With a supportive policy environment, Malaysia can harness growth in areas such as medical tourism, pharmaceutical research and development, medical device manufacturing, health information technology, and telemedicine, among others. Health system reform also presents an important opportunity for the government to respond to citizen demands and increase satisfaction with public services.

5. Diagnosing Causes of Health System Performance

The key health system performance issues identified by the MHSR analysis are:

- **Widening gaps in health outcomes** in terms of slowing rates of improvement in maternal and child health, limited improvement in adult life expectancy, a rising burden of NCDs, and high levels of avoidable premature deaths;
- A future trajectory of **rising expenditures;**
- **Potential for worsening financial risk protection** as costs rise if private health care expenditures are not pooled;
- **Dissatisfaction** related to aspects of service quality and responsiveness in the government system;
- **Emerging access problems** related to the uneven distribution of resources and a relative lack of access to comprehensive primary health care (clinics with a full complement of on-site laboratory, radiology, and pharmacy services) required to manage and treat NCDs;
- **Inadequate management of NCDs** at the population level, as evidenced by the rapidly rising prevalence of NCDs, high share (more than 50 percent) of the population with NCDs not diagnosed, and 98 percent of the population with at least one risk factor for NCDs; and
- **Allocative and technical inefficiencies,** for example with resources concentrated toward hospital-based care and slower growth in health expenditures for primary health care relative to secondary and tertiary health care.

The Malaysian health system is a 'mixed' system with public and private financing and health service provision and distinct governance, organization, financing, and payment arrangements for each sector. The public sector is based on a 'National Health System' model of government-organized health care financed through general revenues, with historical line-item budgets and a salaried staff made up of civil servants. On the private side, a mix of healthcare providers operate under a light regulatory regime, earning revenues primarily through fee-for-service, out-of-pocket pay-

ments by patients, and increasingly also through private insurance. These arrangements contribute to the system-level performance outcomes observed through a number of supply and demand-side factors, which interact with each other.

On the **supply side**, we identify the following causal determinants of performance:

- **Relatively low levels of public spending** on health care, which partly contribute to slowing improvement in population health outcomes and demand for private services;
- **Suboptimal provider payment mechanisms** in both the public and private sectors: In the public sector, line-item budgets do not allow for flexibility in resource use at lower levels, while salaries provide weak performance incentives. In the private sector, fee-for-service payment can contribute to overtreatment due to 'supplier-induced demand';
- **Uneven distribution of resources** across public and private services related to organizational and institutional factors;
- **Ineffective continuity and coordination** of care for patients;
- **Rigid management structures in the public system**, which provide weak capacity and incentives for performance improvement.

On the **demand side**, causal determinants of performance include:

- Variable **physical access to comprehensive primary health care services**, especially for management of chronic illness;
- Low levels of **health-producing behaviors** among the population, which could be influenced both through public health as well as clinical interventions (such as screening and counseling);
- Limited **awareness of need** for health care, in particular for screening services and preventive care;
- **Financial barriers** which likely impede many Malaysians from accessing higher service quality in the private sector;
- **Quality perceptions,** particularly related to service quality, which drive demand for private services.

6. Conclusion

Malaysia's health system is at a crossroads. The system has very effectively countered the health challenges it was designed to address, namely high levels of maternal mortality, infant mortality, and under-five mortality, and has achieved excellent outcomes. But the health system faces new challenges in the face of a rapidly evolving context—characterized by demographic and epidemiological transitions, a shifting socio-cultural environment, technological changes, and rising income levels, which have contributed to a nutritional transition, increasing health risks, and new user expectations. In effect, Malaysia demonstrates a classic case of *asymmetric transition*, where the rapid transitions in context have not been matched with a correspond-

ing transition in the health system to better address the current and future needs of the population.

However, in many ways Malaysia is well-positioned to transform its health system to meet current and future needs. The healthcare infrastructure is in place, health human resources are available, and health spending is still relatively low, making further investment possible. The population has high levels of human capital with good technological literacy. While transformative change cannot be achieved overnight, Malaysian policymakers would be wise to implement stepwise innovations which will strengthen the Malaysian health system in order to more effectively address population needs and changes in the national context.

1. Introduction

1.1. Objectives of the Report and Context of MHSR

Malaysia Health Systems Research (MHSR) is a collaboration involving the Government of Malaysia and Harvard University. The collaborative study includes senior faculty from the Harvard T.H. Chan School of Public Health (investigators: Prof. Rifat Atun, Prof. Peter Berman, Prof. William Hsiao), a Harvard Senior Advisory Team and Research Team ('Harvard Team'), as well as senior officials and a team of researchers and analysts convened by the Ministry of Health ('Team Malaysia').

The Malaysian government aims to build on the strengths of the country's existing health system, and to develop a sustainable system that is equitable, efficient, effective, and responsive to citizens needs by strengthening financing, delivery, and governance mechanisms to adapt to the rapidly changing context. MHSR contributes to this aim with the objective of developing a clear and comprehensive strategic plan for Malaysia's health system transformation, including a technically sound reform design and a plan for reform implementation.

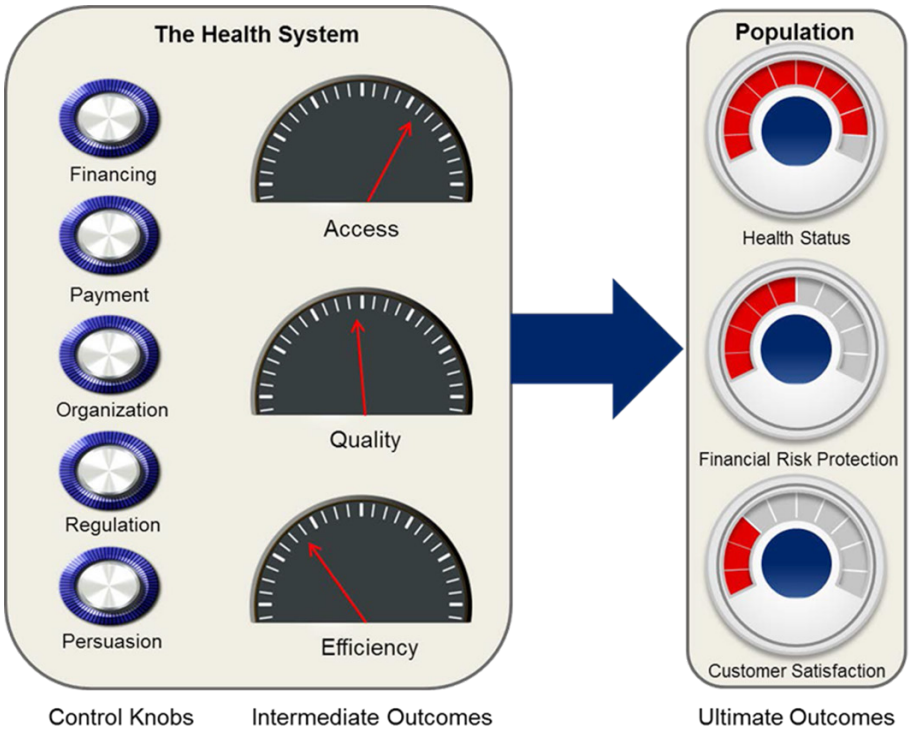
This report represents the final deliverable for Phase I of MHSR. Phase I has involved a comprehensive, rigorous, and evidence-based analysis of the Malaysian health system, and—based on this health system assessment—the development of a strategic plan for health system strengthening. This report summarizes the key findings from the Phase I analysis.

In the second phase of MHSR (April 2016–December 2016), the Harvard Team will provide research, analyses, and technical support to develop a detailed reform design and an implementation plan, along with initial advice regarding the implementation activities. Implementation of some reform components may begin during Phase II.

The health system analysis described in this report is the product of a comprehensive collaborative effort between the Harvard Team and Team Malaysia (see Appendix 1). The research collaboration involved 23 'Analytic Teams,' with consistent involvement of Malaysian researchers in the design, data collection, and analysis of research presented here. The collaborative design of MHSR, while producing one of the most comprehensive simultaneous assessments of any national health system to date, has also contributed to capacity building for evidence-based health system research within the Malaysian government. The contributions of all team members from both Team Malaysia and the Harvard Team are gratefully acknowledged.

MHSR uses a health system analysis framework developed by Harvard researchers that enables rigorous, consistent, and objective analysis of health system performance (Figure 1) [1]. The framework and its variants have been used in analysis of numerous countries worldwide, including Turkey, China, Uganda, and India, among others [2, 3].

Figure 1. The Harvard Framework for Health System Analysis and Reform [1]



1.2. Brief History of Malaysia's Health System

The Malaysian health system is widely regarded internationally as a relatively successful health system model. The World Health Organization's health system review of Malaysia reported that "Malaysia has achieved impressive health gains for its population with a low-cost healthcare system that provides universal and comprehensive services…" [4]. This recognition reflects the well-documented progress Malaysia has made in extending average life expectancy at birth, especially through successful control of communicable diseases and improvements in maternal and child health. Malaysia is also recognized for achieving relatively low total health expenditures while ensuring a high level of universal access and strong and equitable financial protection from high health care costs.

Despite its many positive accomplishments in health, the Malaysian government has been exploring options for improving the health system since the early 1980s. As Malaysians live longer and the nation grows more prosperous, citizen expectations have risen. Increasingly, Malaysian leaders see on the horizon a future of growing health expenditures that will be needed to sustain equity while expanding the scope and quality of services. The Government of Malaysia maintains a strong pro-growth orientation with rigorous fiscal discipline. As is the case in most upper-income and developed countries, the government is wary of large future fiscal obligations for health expenditures that could arise in a predominantly tax-financed health system

with a large government-owned and government-operated healthcare delivery system, as this system expands to meet future health needs.

Over the past 30 years, beginning with the Health Sector Financing Study by Westinghouse Health Systems (1984–85) [5], which called for a transition toward universal, compulsory social health insurance, the Malaysian government has commissioned at least seven major reports on health system reform. During this period, various incremental policy changes were introduced to increase the role of the private sector in health service provision while diversifying sources of health system financing. As part of the transition to create a health system with pluralistic financing and health service provision, the government has encouraged private investment, contracted out several health system activities—such as drug distribution and hospital support services—to the private sector, and corporatized the National Heart Institute [6]. On the financing side, several policies were introduced to enable citizens to use up to 10 percent of their Employee Provident Fund savings for medical expenses, provide tax breaks for the purchase of private health insurance, establish the Medical Assistance Fund, and mandate a new Health Insurance Coverage Scheme for Foreign Workers (SPIKPA) [6]. Beginning in 2004, a pilot system of permitting 'full-fee paying patients' in public hospitals was introduced to generate additional revenue for public hospitals [7]. The scheme also provides additional remuneration for senior doctors who might otherwise leave public service in order to practice in the private sector, which offers much higher income potential.

Despite this long history of health policy deliberations and incremental changes, the Malaysian government has not introduced comprehensive health system reform. The latest health system reform initiative, '1Care for 1Malaysia,' would have created a universal health insurance system. The initiative was developed by the Ministry of Health (MOH) as part of the 10th Malaysia Plan (2011–2015) and received approval from the Prime Minister's Office, but was ultimately not taken forward due to a vocal opposition campaign that emerged after an early draft of the 1Care concept paper was leaked to the media [6].

As Malaysia stands at the cusp of becoming a high-income nation, it has the opportunity to strengthen the health system by enhancing organization, financing, and health service provision, building a future health system that would continue to deliver the equitable universal access to health care services and strong financial risk protection that are so valued by the population. A stronger health system would not only enable Malaysia to respond to emerging challenges and opportunities, but also help the government to meet the increasing expectations of citizens.

1.3. Health System Objectives and Priorities

We have designed our research study and recommendations using the Harvard framework for health system analysis and reform to address health system goals, namely to improve health, provide financial protection, and ensure citizen satisfaction by achieving equity, efficiency, effectiveness, and responsiveness, which are fundamental for health system performance.

Based on our extensive policy discussions with government stakeholders, four broad policy considerations and priorities need to be taken into account while addressing health system goals. First, Malaysia must sustain and consolidate its notable successes to date in delivering improved health outcomes to the population. But as the epidemiological burden and other contextual factors (such as the country's demographic profile, economic growth, socio-cultural milieu, lifestyle and nutritional transition, and technology availability and use) have changed, so too have the nature and range of health services needed to meet population needs and expectations. The system must now be redesigned in the face of these new realities. Reflecting this rapidly changing context, the health strategy included in the 11th Malaysia plan prioritizes "improving system delivery for better health outcomes" [8]. The analysis and recommendations emerging from MHSR are designed to address the system-level implications of the changing context and changing needs.

Second, Malaysia's leaders place strong priority on the fiscal sustainability of the health system. Across all countries, health system expenditures rise as economies grow, per capita GDP increases, citizens' expectations change, and medical technologies advance. In the future, meeting the increasing expectations of the Malaysian population will require further investment in health. Malaysia's current health system—with its long legacy of public financing and provision of health care services—places a large share of the burden of rising health system spending on the public budget. Harnessing new and sustainable sources of financing for the health system is an important priority for the country.

Third, Malaysia's national development strategy is one of inclusive growth. The 11th Malaysia Plan envisions "anchoring growth on people." [9]. For the health system, this means protecting the principles of equity and inclusivity on which the health system is founded. Two of the principal successes of the health system to date have been the strong financial risk protection afforded to the population—especially to the poor—and the broad and equitable access provided through the public healthcare service delivery system. Reflecting this pro-poor orientation, the 11th Malaysia Plan includes strategies to further enhance provision of healthcare services for underserved communities and increase accessibility [8].

Fourth, the emphasis placed on economic growth, as Malaysia continues its journey toward developed nation status (Vision 2020), implies harnessing the health sector as an engine of economic development [10]. Health care was one of the 12 "National Key Economic Areas" identified in the 10th Malaysia Plan as key drivers of economic growth, while the health strategy for the 11th Malaysia Plan includes 'intensifying collaboration with the private sector' [8]. Any health sector reform, therefore, should take into account the economic opportunities offered by investment in health, and must leverage Malaysia's dynamic private sector, which is active in the provision of health care services (including medical tourism), pharmaceutical research and development (R&D), medical device R&D and manufacturing, and health information technology.

We take the broad policy considerations outlined above as a point of departure for our analysis assessing the performance of Malaysia's health system.

2. Health System Performance: Ultimate Outcomes

The Harvard framework for health systems analysis is based on a diagnostic approach that takes health system performance as a starting point (Figure 1, Section 1.1). As a first step in this analysis, an assessment of health system performance is used to identify achievements of the health system over time, benchmarked with peer countries. A rigorous examination of evidence then informs potential causes of identified performance challenges stemming from the changes in the broad context and in the design and interaction of the various health system functions—i.e. organization, governance, financing, and provider payments.

In this first section of the report, we assess the performance of the Malaysian health system in achieving the three ultimate goals of any health system: improving population health outcomes, providing financial risk protection, and ensuring broad user satisfaction with the system. We assess both average outcomes on each of these dimensions, as well as their distribution—considering thereby issues of equity related to how different groups within the population fare on each measure. The purpose of this analysis is both to understand where the system is performing well, and to identify areas that need further strengthening.

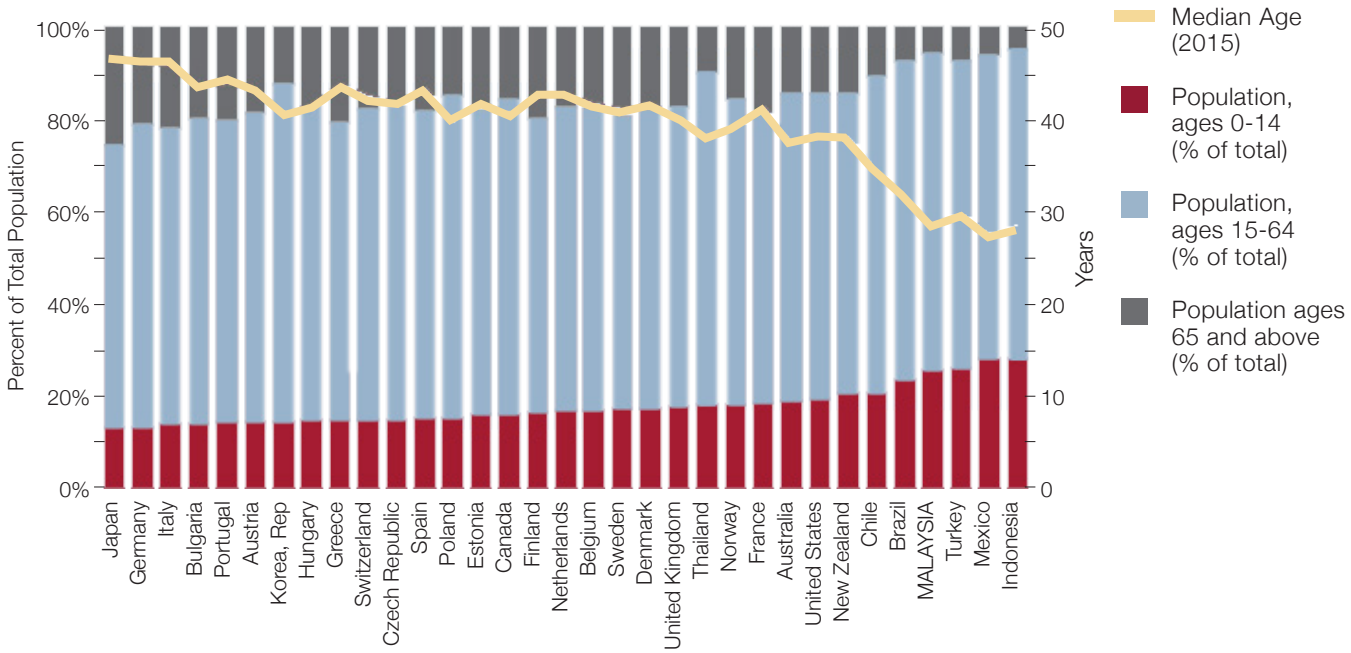
In this report, we benchmark Malaysia's performance with a variety of comparator countries, emphasizing countries that are at a similar level of income to Malaysia, such as Brazil, Turkey, Chile, and Mexico. We also compare Malaysia with neighboring Thailand, which has a lower income level, and to high-income regional comparators such as South Korea, Hong Kong, and Singapore. Furthermore, for many indicators, comparisons with OECD countries are included. (The comparator countries included for each indicator vary according to data availability.) Health outcomes are significantly associated with income levels, so it is not unexpected that Malaysia has different outcomes than higher-income countries, and this should not necessarily be interpreted as poor performance. As Malaysia grows, the outcomes observed in high-income countries can be informative of possible future trends, as well as opportunities for future improvements and trajectory.

When comparing health system indicators across countries, it is also important to note that the age structure of countries varies dramatically, with important impacts on epidemiology and health care needs. Figure 2 below contrasts the age structure of the Malaysian population with key comparators. Malaysia's population has a larger proportion of people aged less than 65 years than most OECD countries, but a similar proportion to Chile, Brazil, Turkey, and Mexico. Thailand, on the other hand, has a slightly larger proportion of people aged 65 years or older compared to Malaysia.

2.1. Population Health Outcomes

Improving the level and distribution of population health is one of the three ultimate goals for any health

Figure 2. Age Structure Comparison between Malaysia and Selected OECD Countries, 2014/2015



Data Source: World Bank World Development Indicators (2014) and UN Population Division (2015)

system. There are many indicators used to measure population health; here we examine several key indicators related to mortality and morbidity. As part of MHSR, we also investigated proximal risk factors for major chronic conditions; these are discussed in Section 4.1.2. While avoidable premature mortality represents a consequence of cumulative problems of the past, morbidity represents a combination of problems of the past and problems of today. Risk factors, on the other hand, are good indicators for morbidity and mortality in the future, and hence critically important in considering a health system design that is fit for the future.

It is important to note that the health system is not the only—or even the primary—determinant of these health outcomes. Health is shaped by many social and economic factors beyond the realm of the health system. However, health system functions, including public health and individual health care services, are designed to improve both individual and population health outcomes, and hence it is important to assess performance on this dimension.

Malaysia has achieved remarkable improvements in health outcomes over the past half-century. At the time of Independence, in 1957, Malaysia's infant mortality rate was 75.5 deaths per 1,000 live births. Infant mortality has since fallen by more than 90 percent, to 6.5 deaths per 1,000 live births in 2013. Similarly, between 1966 (the earliest data available) and 2013, the mortality rate of children under age 5 fell from 65.2 per 1,000 live births to 8.0 per 1,000 live births, a decline of 88 percent.

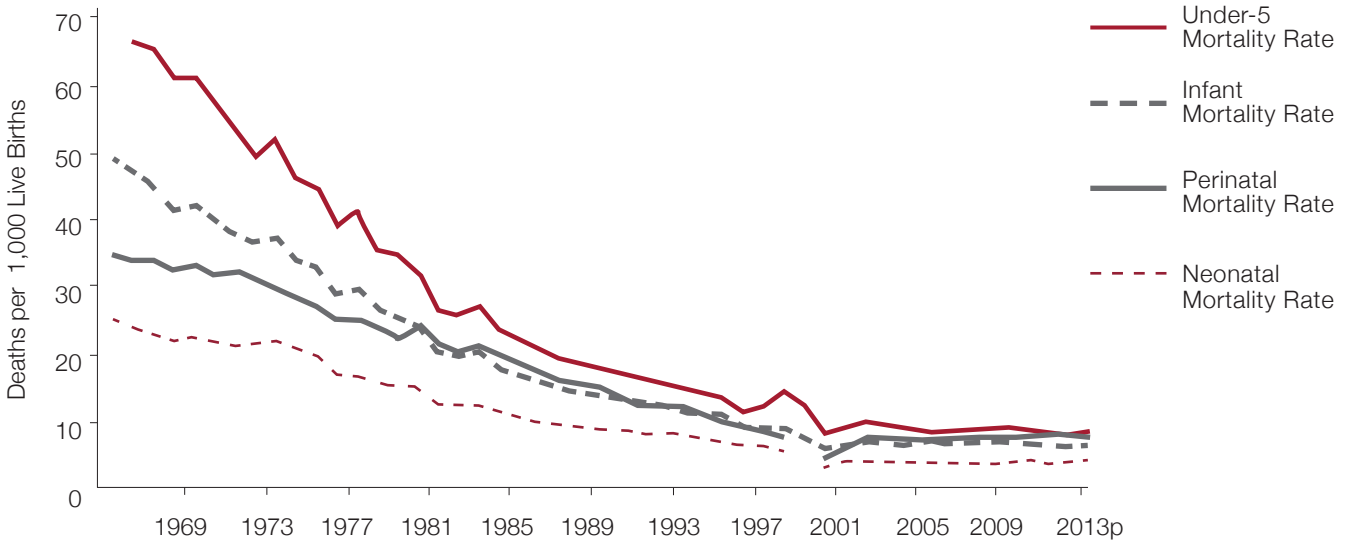
The declines in infant and child mortality achieved

by Malaysia were more rapid than similar transitions in most other middle-income countries from Independence until the turn of the century, after which Malaysia did not see further declines. Nonetheless, Malaysia's outcomes compare favorably with upper-middle income to high-income comparator countries such as Turkey, Brazil, and Chile (which in 2013 had infant mortality rates of 13.2, 14.3, and 7.3, according to preliminary data) [11]. Several regional high-income comparator countries have achieved lower overall rates for infant, child, and maternal mortality. For example, in 2011 Hong Kong and Singapore had infant mortality rates of 1.4 and 2.2, while in 2013 Australia and New Zealand had infant mortality rates of 3.4 and 4.9, respectively, based on preliminary data [12]. These figures suggest room for further improvement as Malaysia continues to grow, despite Malaysia's strong performance to date.

Over the past decade and a half, the rates of infant mortality and under-five mortality have plateaued, with no improvement seen since 2000 (Figure 3). The majority of child deaths are due to neonatal mortality (deaths of infants less than 28 days old) and infant mortality (deaths of infants under 1 year). Of the 8.0 deaths per 1,000 live births of children under five years estimated in 2013, 4.1 deaths occurred during the first 28 days (neonatal mortality), while 6.5 occurred during the first year (infant mortality). The perinatal mortality rate (which also includes stillbirths) was 7.3 per 1,000 total births [12].

The changes observed for maternal mortality mirror those for infant mortality and under-five mortality.

Figure 3. Rates of Transition of Infant Mortality Rate, Neonatal Mortality Rate, Perinatal Mortality Rate, and Under-Five Mortality Rate, 1965-2013



p: preliminary for Malaysia

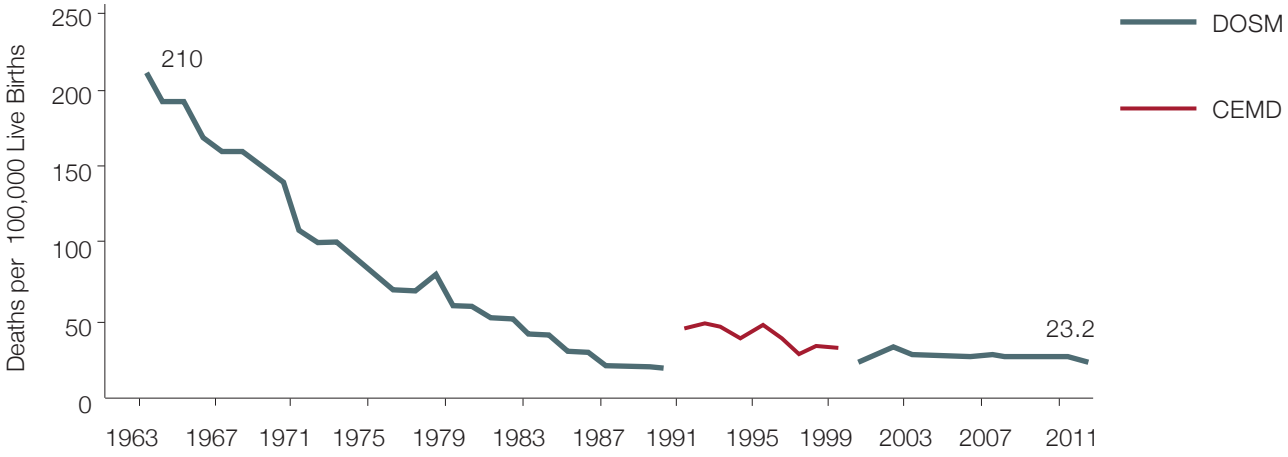
Data Source: Department of Statistics Malaysia

Maternal health also improved greatly over the time period 1963–2013, with the maternal mortality ratio falling by 89 percent, from 210 deaths per 100,000 live births to 23.2 deaths. However, since the late 1980s Malaysia's maternal mortality ratio has plateaued, and between 1989 and 2012, has actually increased slightly from 19.6 to 23.2 (Figure 4) [12].[1]

The large declines in infant mortality and under-five mortality have driven Malaysia's substantial increase in average life expectancy at birth. Since 1965, average life expectancy at birth has increased from 62.4 years for males and 64.0 years for females to 72.5 years for males and 77.4 years for females, a gain of more than 6 years overall (Figure 5) [12]. Other middle-income countries achieved even more rapid gains over this period, but most started from a lower point [11].

Because changes in total life expectancy are extremely sensitive to changes in infant and child mortality (since reductions in these lead to the greatest gains in expected life years), it is useful to examine not only average life expectancy at birth, but also remaining life expectancy among adults. On these measures, Malaysia has experienced more modest gains in absolute terms and relative to comparator countries, especially for males. For example, life expectancy at age 30 has increased from 39.8 years for males and 40.7 years for females in 1965 to 44.2 years for males and 48.4 years for females in 2015, according to preliminary 2015 estimates from the Department of Statistics (Figure 6). Similarly, at age 60, we see very modest gains in life expectancy for men and more substantial gains for women over the past half-century. While in 1965, a 60-year-old male

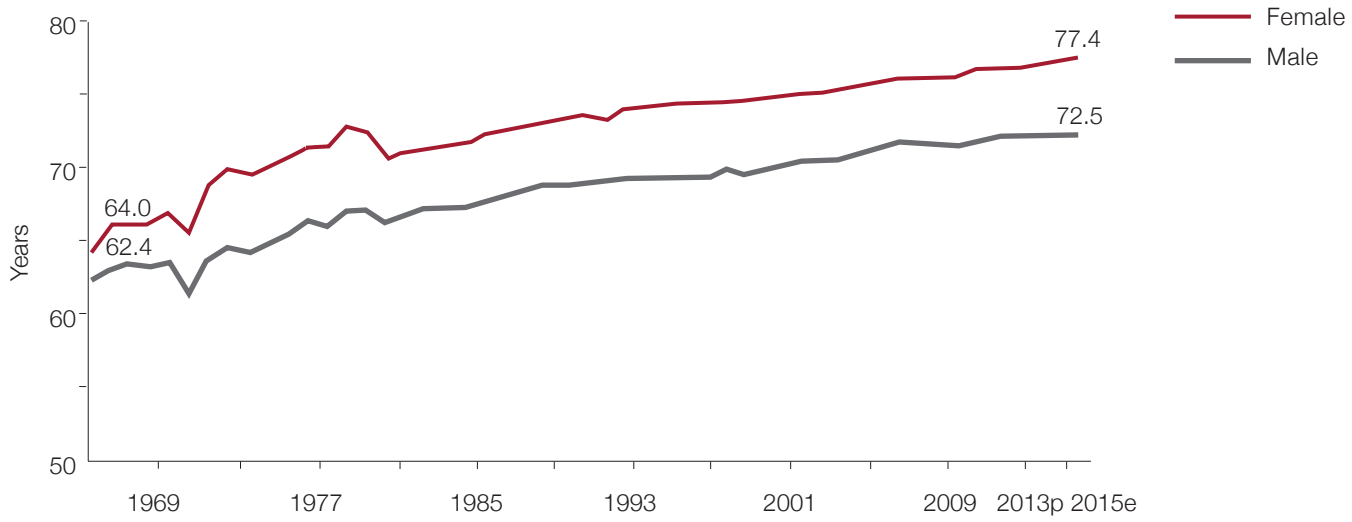
Figure 4. Maternal Mortality Ratio, 1963-2011



Data Source: Department of Statistics Malaysia (1963-1990 and 2000-2011);
Confidential Enquiry into Maternal Death (1991-1999)

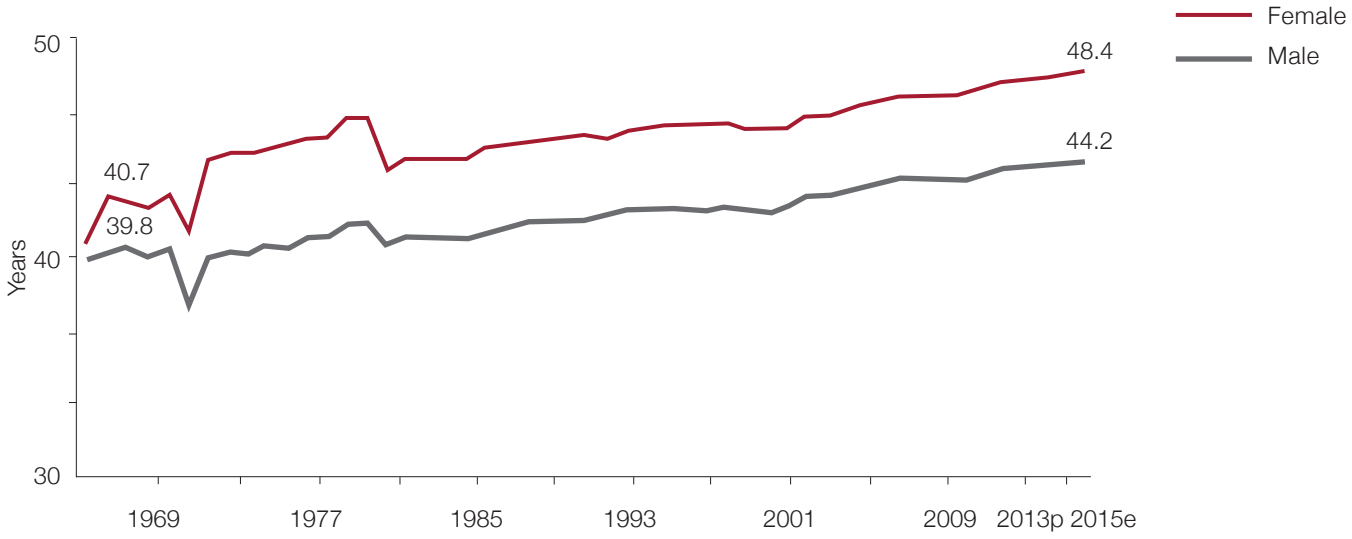
1 The data on material, infant, and under-five mortality include both Malaysian citizens and non-citizens. Data has been requested, but is not yet available, to determine whether there is a significant difference in mortality rates by citizenship status.

Figure 5. Life Expectancy at Birth by Sex in Malaysia, 1965–2015



e: estimation; p: preliminary
Data Source: Department of Statistics Malaysia
Note: Y axis truncated for readability; 1965 - 1990 = Life expectancy for Peninsular Malaysia and 1991 - 2015 = Life expectancy for Malaysia

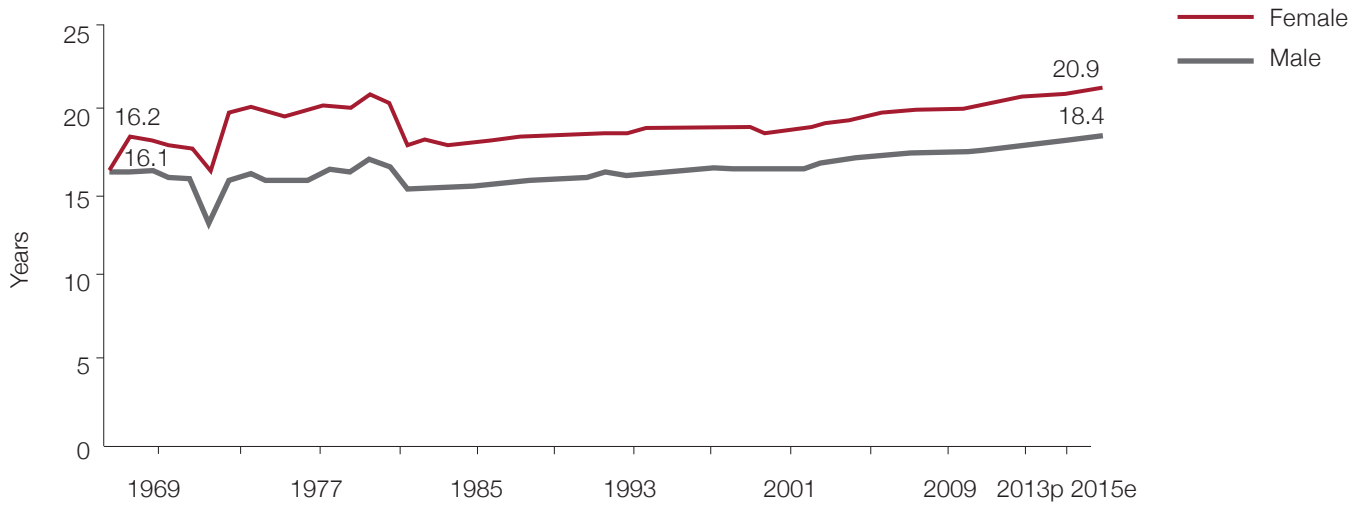
Figure 6. Life Expectancy at 30 Years in Malaysia, 1965–2015



e - estimation; p - preliminary
Data Source: Department of Statistics Malaysia
Note: Y axis truncated for readability

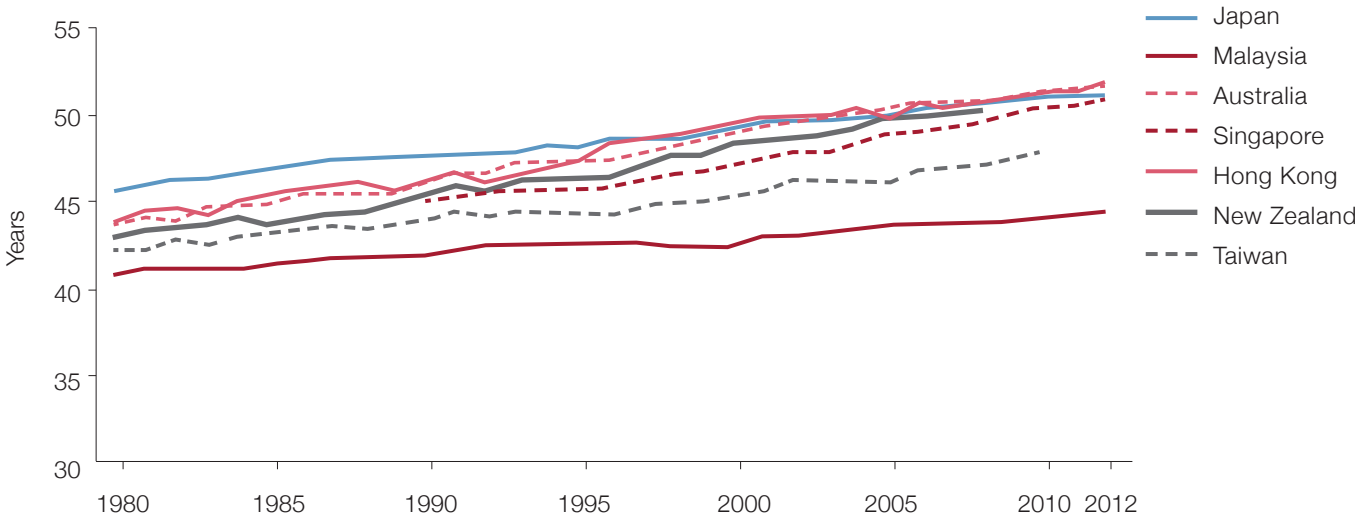
in Malaysia could expect to live 16.1 additional years and a 60-year-old woman could expect to live 16.2 additional years; by 2015, according to preliminary estimates, these figures had risen to 18.4 and 20.9, respectively (Figure 7) [12].

Figure 7. Life Expectancy at 60 Years in Malaysia, 1965–2015



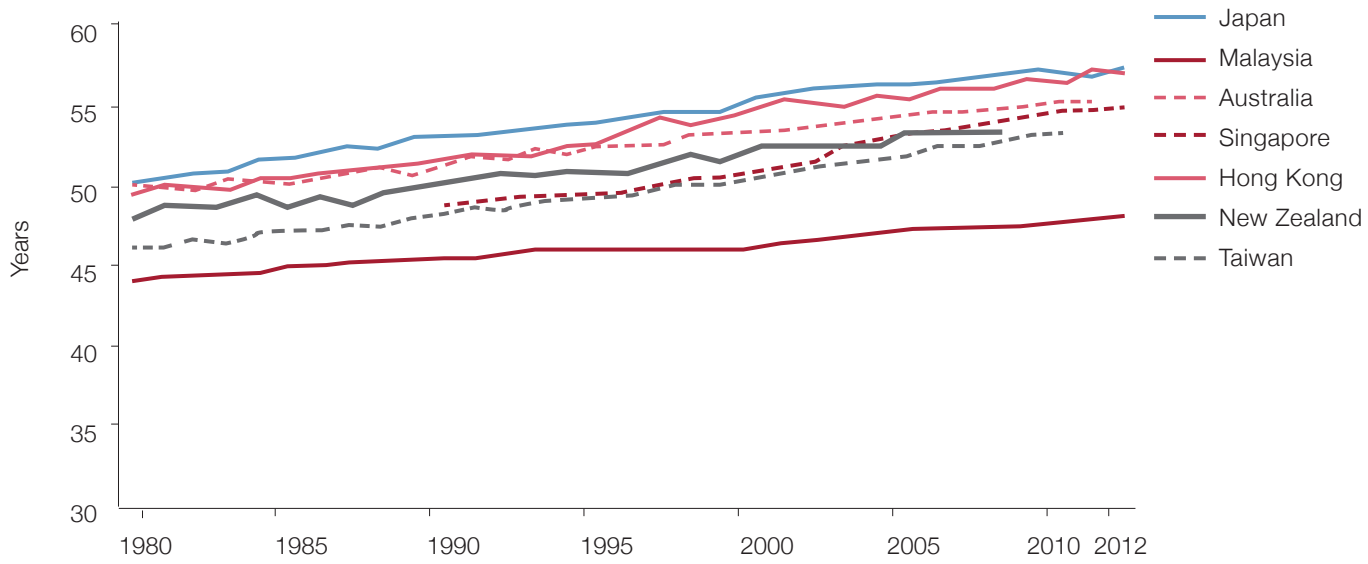
e - estimation; p - preliminary
Data Source: Department of Statistics Malaysia
Note: Y axis truncated for readability; 1965 - 1990 = Life expectancy for Peninsular Malaysia and 1991 - 2015 = Life expectancy for Malaysia

Figure 8. Male Life Expectancy at 30 Years in Malaysia and High-Income Regional Comparators, 1980–2012



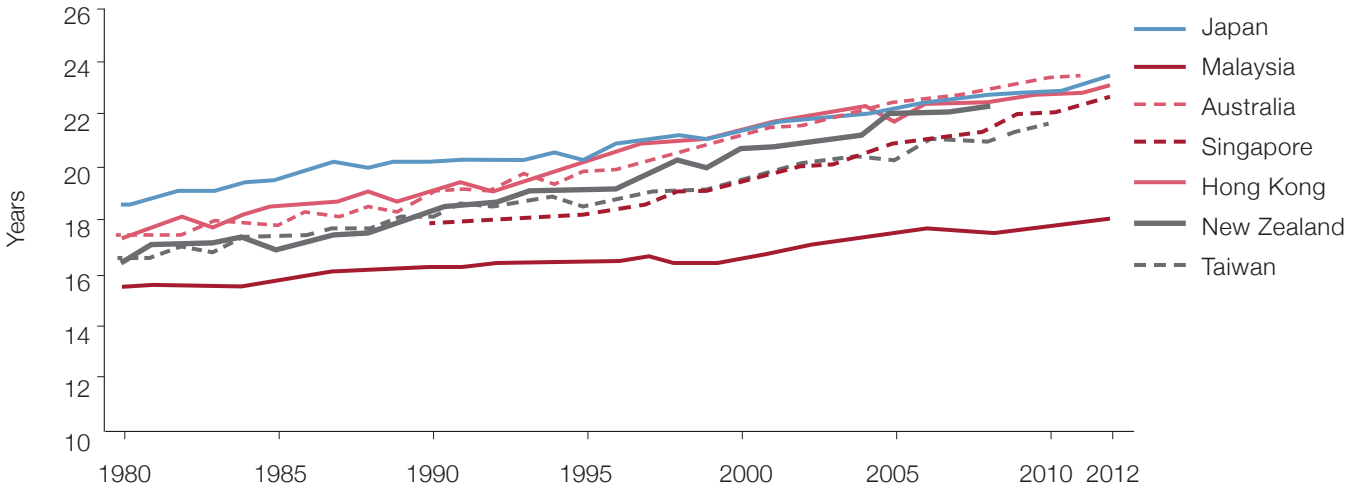
Data Source: Department of Statistics Malaysia, Census and Statistics Department Hong Kong, Singapore Department of Statistics, The Human Mortality Database (http://www.mortality.org/)
Note: Y axis truncated for readability

Figure 9. Female Life Expectancy at 30 Years in Malaysia and High-Income Regional Comparators, 1980–2012



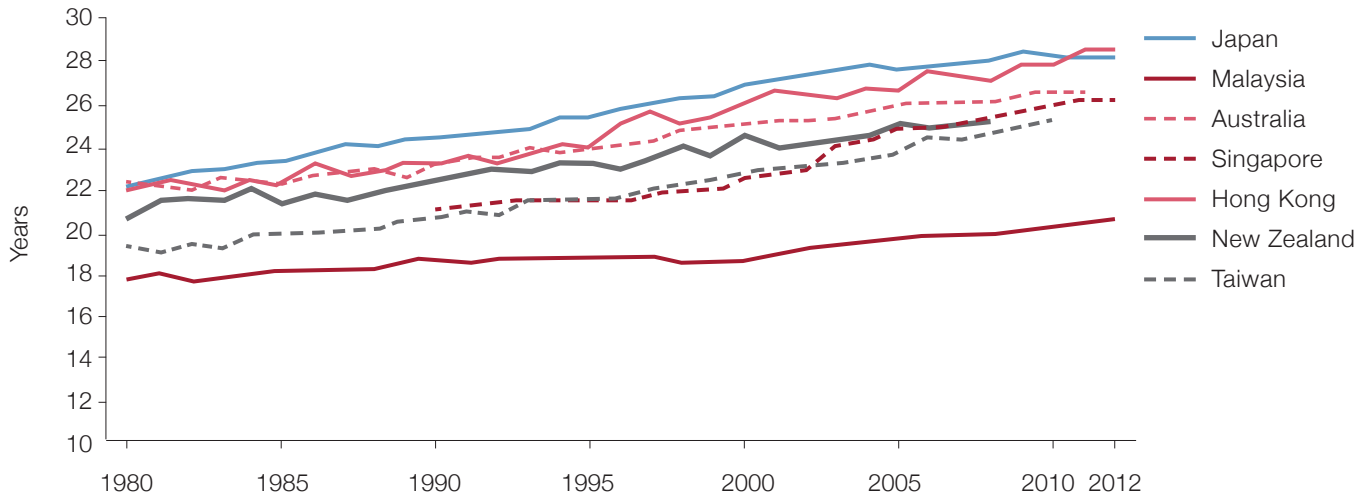
Data Source: Department of Statistics Malaysia, Census and Statistics Department Hong Kong, Singapore Department of Statistics, The Human Mortality Database (http://www.mortality.org/)
Note: Y axis truncated for readability

Figure 10. Male Life Expectancy at 60 Years in Malaysia and High-Income Regional Comparators, 1980–2012



Data Source: Department of Statistics Malaysia, Census and Statistics Department Hong Kong, Singapore Department of Statistics, The Human Mortality Database (http://www.mortality.org/)

Figure 11. Female Life Expectancy at 60 Years in Malaysia and High-Income Regional Comparators, 1980–2012



Data Source: Department of Statistics Malaysia, Census and Statistics Department Hong Kong, Singapore Department of Statistics, The Human Mortality Database (http://www.mortality.org/)
Note: Y axis truncated for readability

International comparison suggests that greater improvements in adult life expectancy could be achieved in Malaysia. Figures 8–11 show that adult life expectancies at age 30 and at age 60 in Malaysia are diverging from high-income regional comparators, which have experienced sustained improvements for this outcome since 1990 [12].

A useful way to examine the contributions of the health system in improving health outcomes is to separate out health outcomes that can feasibly be influenced by currently available health services and medical technology (such as ischemic heart disease) from those (such as a malignant brain tumor) that cannot. The concept of 'avoidable mortality' has been used in high-income OECD countries to measure achievements in reducing premature deaths (before 75 years of age) that are considered preventable by medical intervention [13].

Among OECD countries, avoidable deaths tend to fall faster than non-avoidable deaths [14]. And in recent decades, the greatest declines in avoidable mortality can be seen for cardiovascular disease, which can be explained by a variety of factors including the use of medicines to control risk factors, reductions in dietary salt intake, and improvements in and increasing use of surgical interventions [15, 16]. It is important to note that avoidable mortality rates reflect both the burden of disease as well as factors that prevent or postpone death. There are two commonly used classifications of which deaths constitute avoidable mortality, as defined by researchers Nolte/McKee and Tobias/Yeh; analysis using both classifications (as we have done in MHSR) produces similar results [13, 17]. In the figures that follow, we

use the Nolte/McKee definitions, but results that use the Tobias/Yeh categorization are available in the detailed analysis undertaken by the Avoidable Mortality Analytic Team [19].

Estimates developed by the Avoidable Mortality Analytic Team show that avoidable mortality rates in Malaysia are higher than those observed in all OECD countries as well as a regional lower middle-income country comparator, Sri Lanka, which spends far less on health per person and as a proportion of GDP (Figure 12).[2] Furthermore, avoidable mortality rates have declined more slowly in Malaysia than in all comparator countries for the decade 1997–2007, at a rate of 1.3 percent per year compared to the OECD average of around 3.7 percent (Figure 13) [18].

The provisional analyses undertaken by MHSR suggest that the lack of decline in deaths due to cardiovascular disease in Malaysia may be driving the divergence in outcomes between Malaysia and OECD countries. Consistent with this finding, declines in avoidable deaths among females (among whom cardiovascular deaths have declined more substantially than that in males) have been larger than declines among males (Table 1). In 2008, the top five causes of avoidable deaths in Malaysia were selected invasive infections, cerebrovascular disease, ischemic heart disease, hypertensive heart disease, and nephritis/nephrosis, which together accounted for 75 percent of avoidable deaths [18].

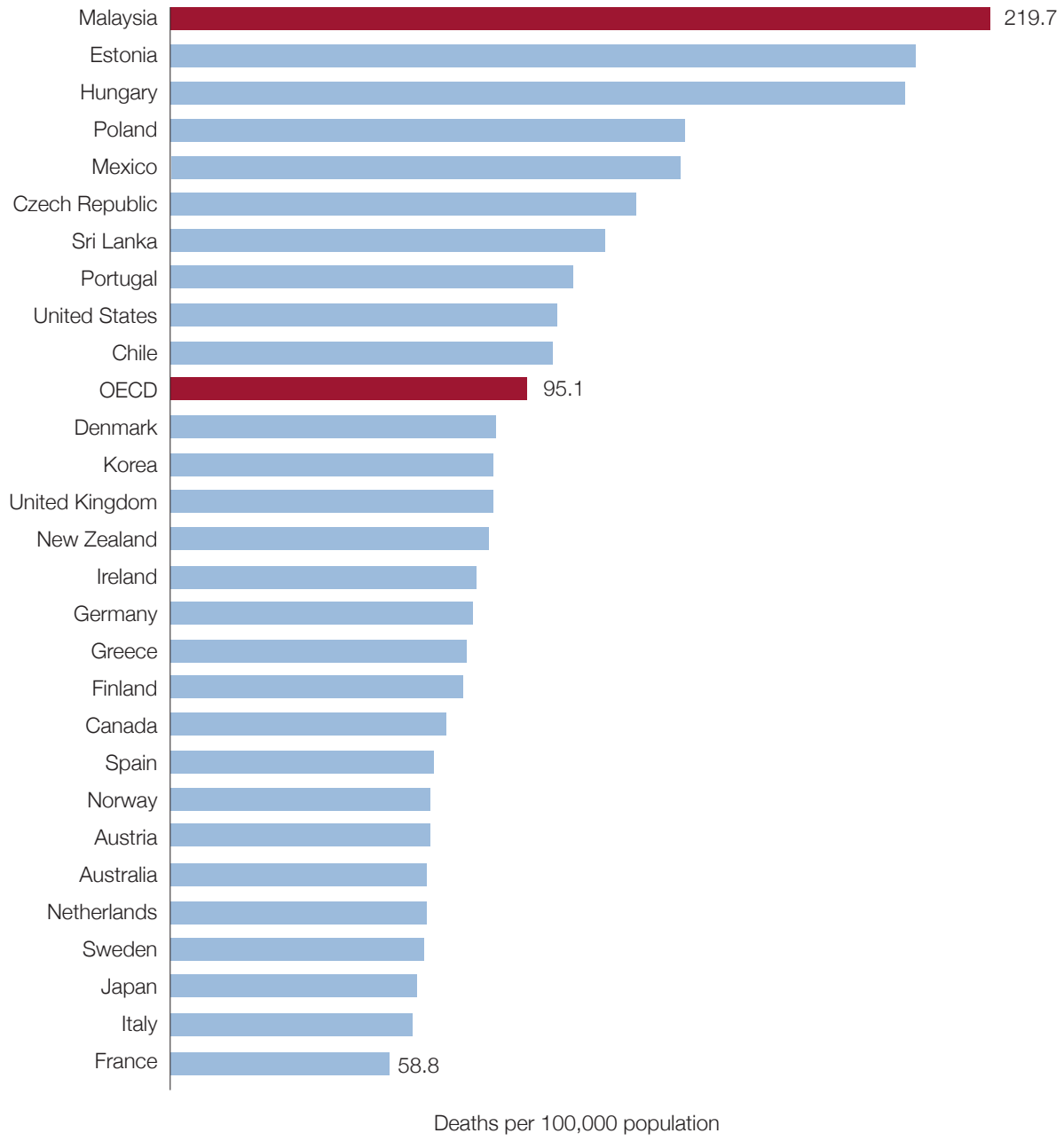
Mortality is not the only important indicator of population health outcomes; wellbeing is also significantly affected by how healthy people are, and what morbidities and disabilities they suffer from. The burden of disease in Malaysia has shifted significantly over the last half century, from communicable diseases and conditions affecting children and pregnant women to an epidemiological profile dominated by NCDs. For example, while in 1990, 28.8 percent of disability-adjusted life years (DALYs) lost in Malaysia were attributable to communicable, maternal, neonatal, and nutritional diseases, by 2013 this share had fallen to 16.6 percent. Conversely, over the same period, the share of DALYs lost due to NCDs increased from 60.2 percent to 71.7 percent, while the share of injuries remained relatively stable at 11.0–11.7 percent [19].

However, the pattern of decline in communicable diseases is not the same for all conditions. Among the most common communicable diseases, the incidence of malaria has declined substantially, from 0.30 percent in 1990 to 0.01 percent in 2014, and the Government of Malaysia has endorsed the regional goal of malaria elimination by 2030 [20]. The incidence of dengue fever, meanwhile, has increased from 0.02 percent in 1990 to 0.36 percent in 2014. The incidence of tuberculosis has increased from 0.06 percent in 1990 to 0.08 percent in 2014, and the incidence of HIV has increased from 0.00 percent in 1990 to 0.01 percent in 2014 [21, 22].

Malaysia's burden of NCDs is high and rapidly increasing, as shown by analysis of National Health and Morbidity Survey (NHMS) data from 1986, 1996, 2006, and 2015. For example, over the past decade, the prevalence of diabetes mellitus, both diagnosed and undiagnosed, has increased 66 percent in adults aged 18 years or older, rising from 11.6 percent in 2006 to 17.5 percent in 2015 [23]. Note that different age cutoffs were used to estimate prevalence in 1986 and 1996, so the data are not strictly comparable.

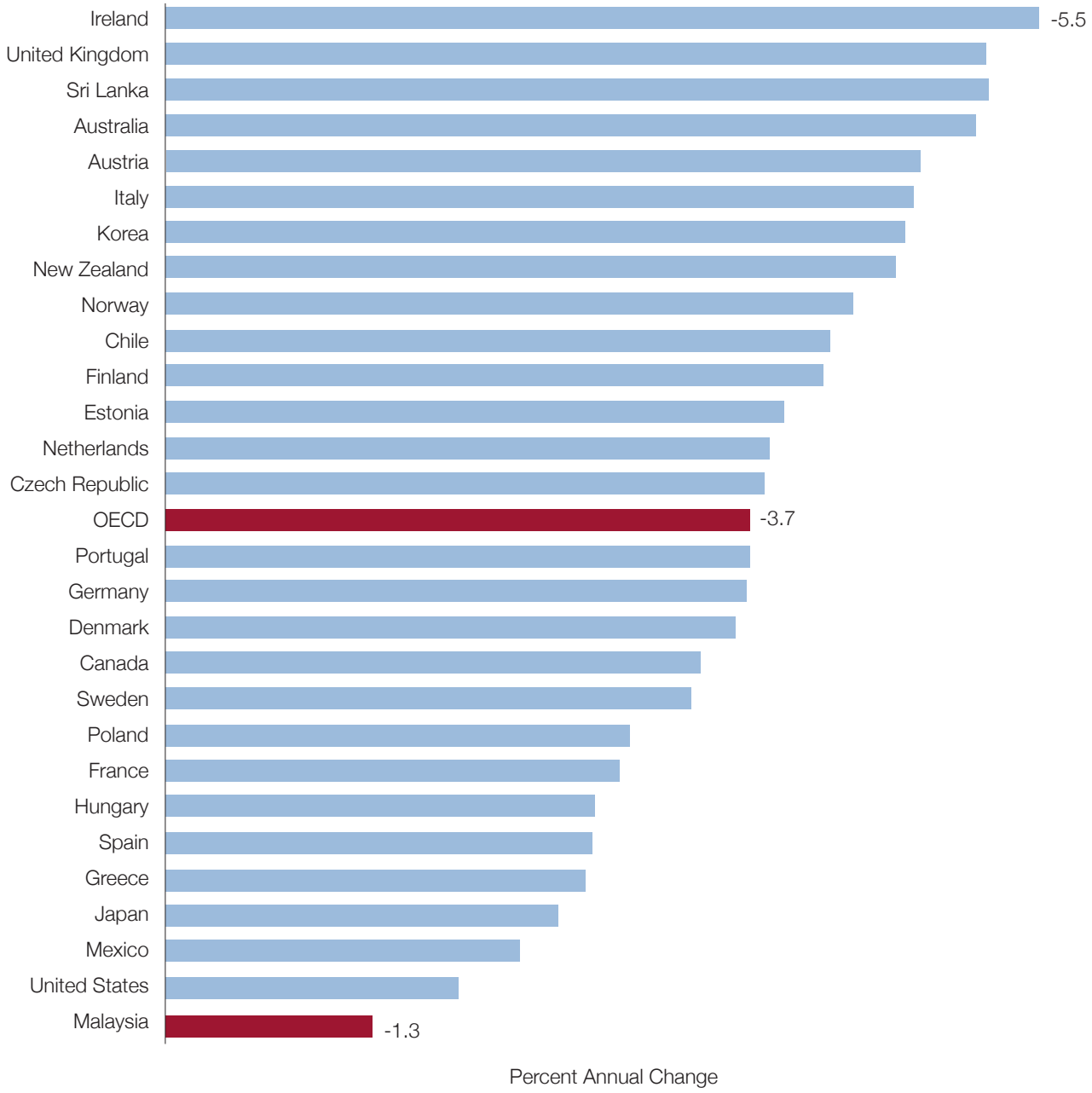
[2] Data on avoidable mortality rates in other countries is not available

Figure 12. Age-Standardized Mortality Rate, Avoidable Causes, 2007 or latest available year



Data Sources: Data for OECD countries: Gay, Juan G., Valérie Paris, Marion Devaux, and Michael de Looper. "Mortality amenable to health care in 31 OECD countries." (2011)
Data for Sri Lanka: Institute for Health Policy
Data for Malaysia: Mortality and population data from Department of Statistics Malaysia, and analytic team's calculation
Note: Nolte/McKee definitions of avoidable causes of death
Age-standardized using the standard population of total OECD population year 2005
Provisional analysis of Malaysian data
2006 data for France, Germany, Denmark, Korea, Italy, Mexico, Norway, Poland and Sweden; 2005 data for Spain, Hungary, New Zealand, United States, and Sri Lanka; 2004 data for Australia and Canada; 2003 data for Portugal; 2007 data for Malaysia & remaining countries

Figure 13. Annual Change in Avoidable Mortality, 1997–2007 or latest available year



Data Sources: Data for OECD countries Gay, Juan G., Valérie Paris, Marion Devaux, and Michael de Looper. "Mortality amenable to health care in 31 OECD countries." (2011)
Data for Sri Lanka: Institute for Health Policy
Data for Malaysia: Mortality and population data from Department of Statistics Malaysia, and analytic team's calculation.
Note: Nolte/McKee definitions of avoidable causes of death
2000 & 2007 data for Malaysia (provisional analysis of Malaysian data); 2006 data for France, Germany, Denmark, Korea, Italy, Mexico, Norway, Poland and Sweden; 2005 data for Spain, Hungary, New Zealand, United States, and Sri Lanka; 2004 data for Australia and Canada; 2003 data for Portugal

Table 1. Declines in Avoidable Deaths in Malaysia by Major Cause, Male and Female, 2000–2008

Males (Age-standardized mortality rate per 100,000 population by disease category)									
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cerebrovascular disease	27.8	24.4	25.0	25.5	24.8	26.2	24.2	25.8	26.2
Colorectal cancer	2.9	3.0	3.2	3.2	3.3	3.3	3.5	3.6	3.8
Congenital malformations	2.0	1.9	2.6	2.3	2.7	2.4	2.1	2.3	2.5
Diabetes mellitus	2.3	2.3	2.5	2.4	2.7	2.7	2.5	2.2	2.2
Epilepsy	4.0	3.6	2.6	2.8	2.7	2.6	2.4	2.3	1.9
Hypertensive disease	16.5	15.2	14.5	11.1	11.9	9.8	10.0	9.1	11.8
Ischemic heart disease (50 percent)	27.5	27.3	26.6	27.7	27.8	27.5	27.1	28.2	29.3
Nephritis & nephrosis	12.2	11.2	12.1	10.0	6.8	10.1	9.2	9.4	9.4
Perinatal deaths (excluding stillbirths)	7.2	7.4	6.2	5.7	7.2	7.2	6.8	6.8	7.5
Selected invasive infections	31.0	33.7	34.6	33.2	33.6	34.9	34.3	33.4	36.2
Tuberculosis	8.9	8.8	8.0	7.8	7.6	7.6	7.4	7.4	7.0
Females (Age-standardized mortality rate per 100,000 population by disease category)									
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Breast cancer (females only)	5.8	6.1	6.3	7.0	7.3	7.4	8.1	8.7	8.3
Cerebrovascular disease	20.8	20.6	21.6	22.1	19.2	19.1	19.1	16.9	18.5
Colorectal cancer	2.2	2.2	2.1	2.3	2.1	2.2	2.3	2.6	2.8
Congenital malformations	1.9	1.9	2.2	2.1	1.7	2.2	2.1	2.1	2.4
Diabetes mellitus	1.9	2.1	2.3	2.2	5.3	2.0	2.5	1.9	1.9
Epilepsy	2.5	2.2	1.9	2.0	1.7	1.8	1.7	1.6	1.5
Hypertensive disease	15.3	12.3	11.2	11.8	7.7	7.9	7.3	7.0	7.1
Ischemic heart disease (50 percent)	12.1	12.1	12.2	12.0	10.5	11.5	10.8	11.2	11.3
Nephritis & nephrosis	9.8	8.7	8.6	8.4	5.5	8.2	7.3	8.2	7.4
Perinatal deaths (excluding stillbirths)	5.6	5.9	5.7	4.5	5.3	5.8	4.8	6.0	5.4
Selected invasive infections	19.6	20.6	21.1	20.1	21.7	23.6	23.5	22.9	23.0
Tuberculosis	4.5	2.9	2.2	2.2	1.8	1.8	2.4	2.4	1.8

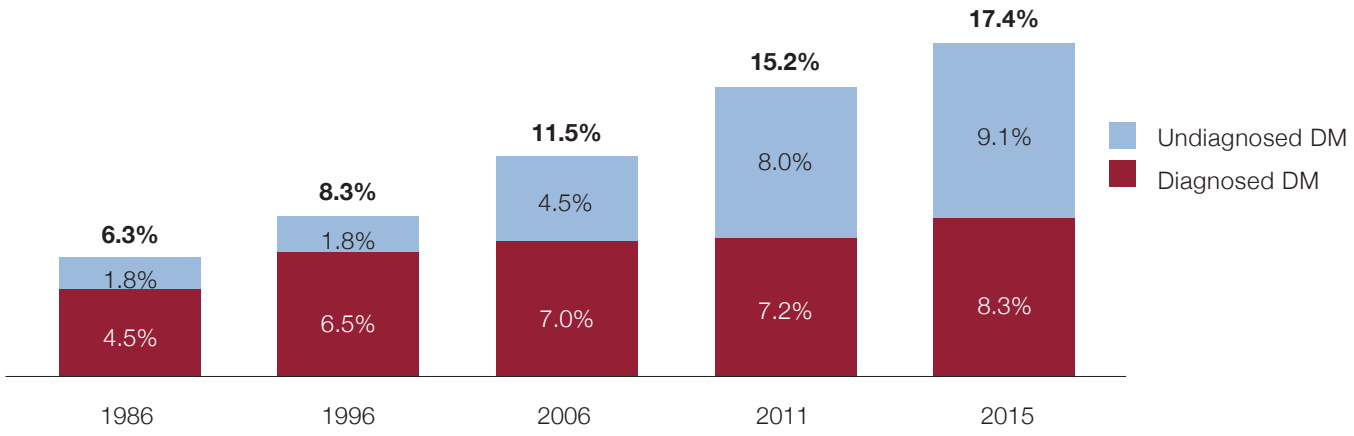
Data Source: Department of Statistics Malaysia

What is of particular concern is that most of the increase in diabetes mellitus is in undiagnosed cases of diabetes. The prevalence of adults with diabetes who were diagnosed has increased only modestly from 7.0 percent of the adult population in 2006 to 8.3 percent in 2015, whereas the prevalence of adults with diabetes who were undiagnosed has increased from 4.5 percent of the adult population in 2006 to 9.1 percent in 2015. More than one half of adults with diabetes in Malaysia are undiagnosed [23]. Hypertension prevalence has also increased substantially between 1986 and 2015 from 14.4 percent of adults aged 35 and above to 30.3 percent of adults aged 18 and above (and 39.8 percent of adults aged 30 and above). Although the prevalence of hypertension is high, there has been a fall in prevalence between 2006 and 2015. In 2006, 37.7 percent of the adult population had hypertension, but by 2015,

What is of particular concern is that most of the increase in diabetes mellitus is in undiagnosed cases of diabetes. The prevalence of adults with diabetes who were diagnosed has increased only modestly from 7.0 percent of the adult population in 2006 to 8.3 percent in 2015, whereas the prevalence of adults with diabetes who were undiagnosed has increased from 4.5 percent of the adult population in 2006 to 9.1 percent in 2015. More than one half of adults with diabetes in Malaysia are undiagnosed [23].

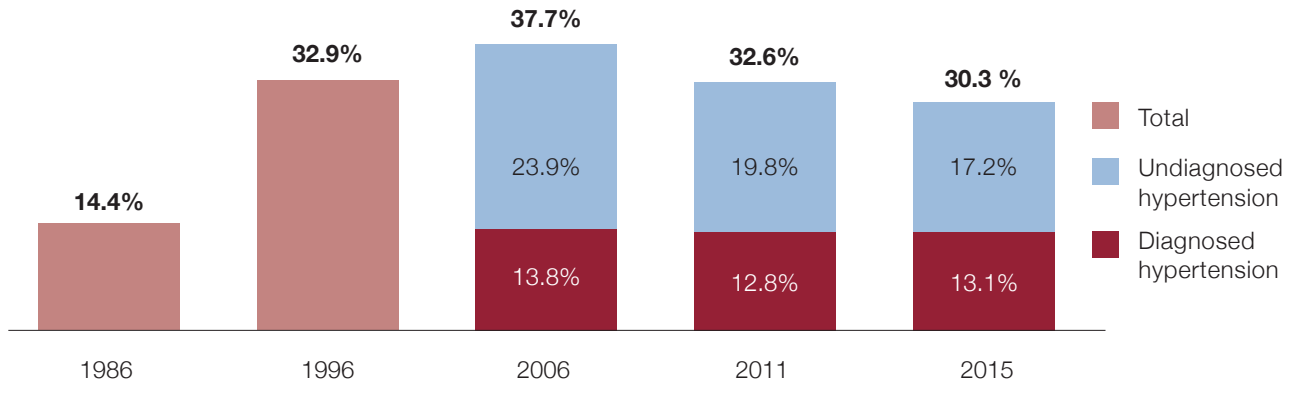
Hypertension prevalence has also increased substantially between 1986 and 2015 from 14.4 percent of adults aged 35 and above to 30.3 percent of adults aged 18 and above (and 39.8 percent of adults aged 30 and above). Although the prevalence of hypertension is high, there has been a fall in prevalence between 2006 and 2015. In 2006, 37.7 percent of the adult population had hypertension, but by 2015, this figure had fallen to 30.3 percent (Figure 15). However, a large proportion of those

Figure 14. Trends in the Prevalence of Diabetes Mellitus, Share of Adult Population, 1986–2015



Data Source: National Health and Morbidity Survey (1986: Age ≥ 35; 1996: Age ≥ 30; 2006-2015: Age ≥ 18)

Figure 15. Trends in the Prevalence of Hypertension, Share of Adult Population, 1986–2015



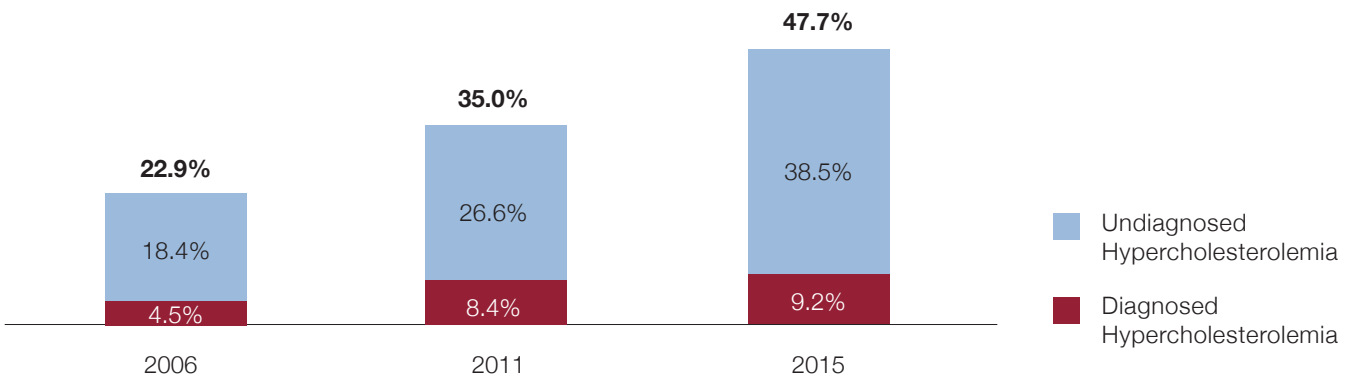
Data Source: National Health and Morbidity Survey (1986: Age ≥ 35; 1996: Age ≥ 30; 2006-2015: Age ≥ 18)

with hypertension are undiagnosed: in 2015, 57 percent of adults with hypertension had not been diagnosed (17.2 percent undiagnosed as compared to 13.1 percent diagnosed) (Figure 15) [23].

As with diabetes, the proportion of the adult population aged 18 years or older with hypercholesterolemia has increased very substantially. Whereas in 2006 (the first year data are available), 22.9 percent of the adult population had hypercholesterolemia, by 2015, in just nine years, the proportion with hypercholesterolemia had more than doubled to reach 47.7 percent (Figure 16). Of particular concern is the fact that the vast majority of adults with hypercholesterolemia are not aware of their condition, and this proportion has increased in the last nine years. In 2006, 80 percent of those with hypercholesterolemia were undiagnosed (18.4 percent of all adults undiagnosed as compared to 4.5 percent diagnosed), and in 2015 the same share (80 percent) of adults with hypercholesterolemia were not aware of their condition (38.5 percent of all adults undiagnosed as compared with just 9.2 percent diagnosed) [23].

These findings suggest that Malaysia has a growing

Figure 16. Trends in the Prevalence of Hypercholesterolemia, 2006–2015



Data Source: National Health and Morbidity Survey

Table 2. Estimated Population Numbers with Diabetes Mellitus, Hypertension, or Hypercholesterolemia, 2015

	Population with the Disease (millions)
Diabetes Mellitus	3.7
Hypertension	6.4
Hypercholesterolemia	10.1

Data Source: NHMS 2015 and Department of Statistics Malaysia

and a dual burden of disease, with high and rapidly rising rates of NCDs alongside persistent problems of infectious disease—particularly dengue and tuberculosis.

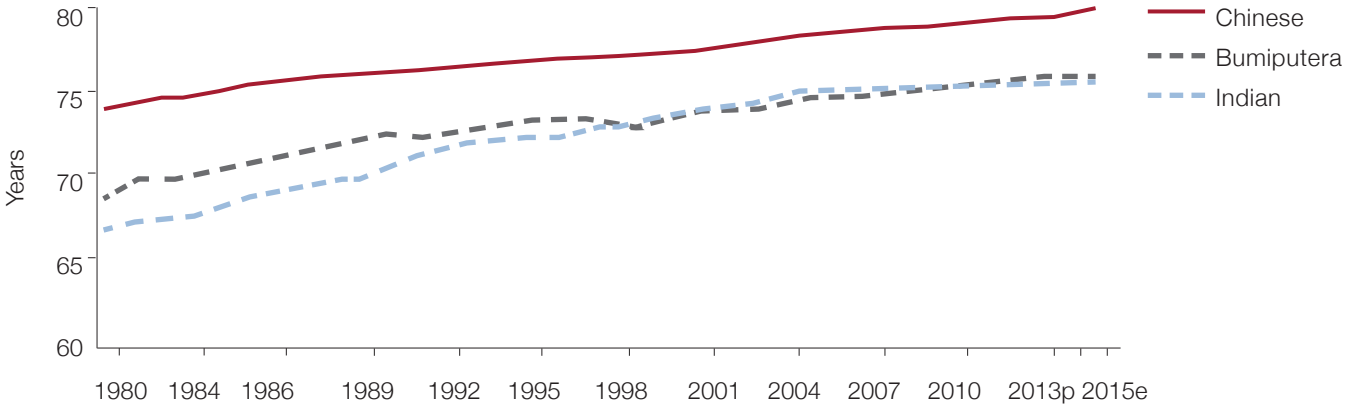
2.2. Population Health Outcomes: Equity

In addition to average population health outcomes, it is also important to examine the distribution of health outcomes in order to assess disparities by citizen characteristics such as socioeconomic status, ethnicity, urban/rural residence, region, and other factors. Such disparities are shaped not only by health system performance (for example, differential access or quality of care), but also by various other influences such as income, health behavior, risk factors, and environmental conditions that are determinants of health. However, the health system can play an important and substantial role in mitigating these disparities.

Using civil registration and vital statistics data from the Department of Statistics Malaysia (DOSM) and household survey data from NHMS 2015, the MHSR Mortality Analytic Team has analyzed mortality rates and life expectancy by ethnicity. Further analysis is ongoing to examine these health outcomes by socioeconomic status and other individual factors.

In terms of life expectancy at birth, Chinese Malaysians live longer on average than Bumiputera (including Malays and other Bumiputera) as well as Indian Malaysians. Among both males and females, Chinese Malaysians live about four years longer on average than Bumiputera. While Indian Malaysian females live about as long as Bumiputera females, Indian Malaysian males fare significantly worse. These disparities in life expectancy across ethnicities in Malaysia persist over time and even widen. For example, while for females of all ethnicities life expectancies at birth have improved and are converging (Figure 17), for males, life expectancy at birth has improved less and the difference between Chinese Malaysians and Bumiputera has widened from 1.6 years in 1981 to an estimated 3.9 years in 2015 (Figure 18). The difference in life expectancy

Figure 17. Life Expectancy at Birth (Years), by Ethnicity, among Malaysian Females, 1980–2015



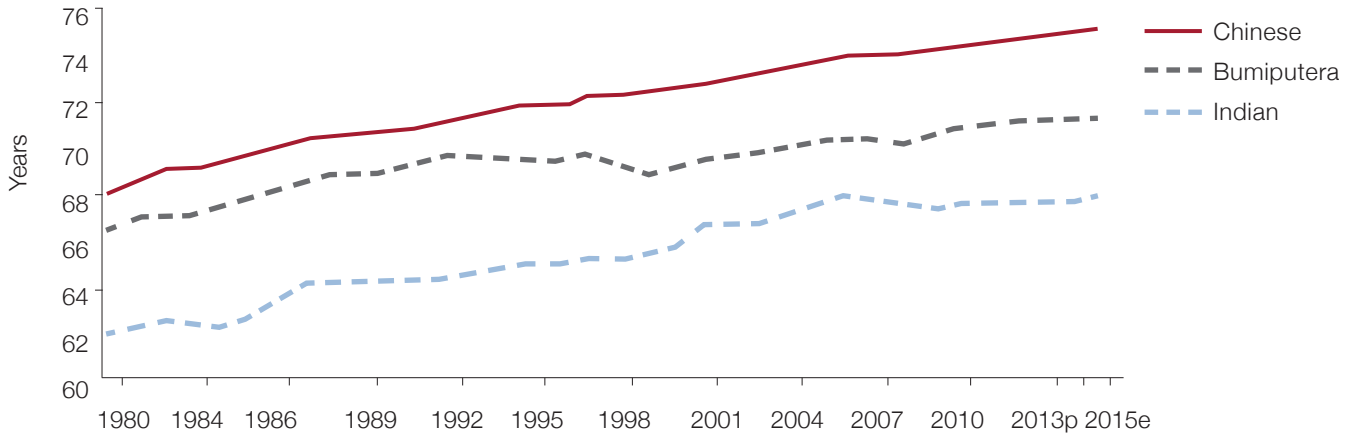
e - estimation p - preliminary
Data Source : Department of Statistics Malaysia

[3] Data from the Department of Statistics do not currently allow for distinguishing outcomes between Malays and other Bumiputera; this analysis is ongoing

at birth between Chinese Malaysians and Indian Malaysians has also widened in absolute terms from 6.3 years in 1981 to an estimated 7.4 years in 2015 [12].[3]

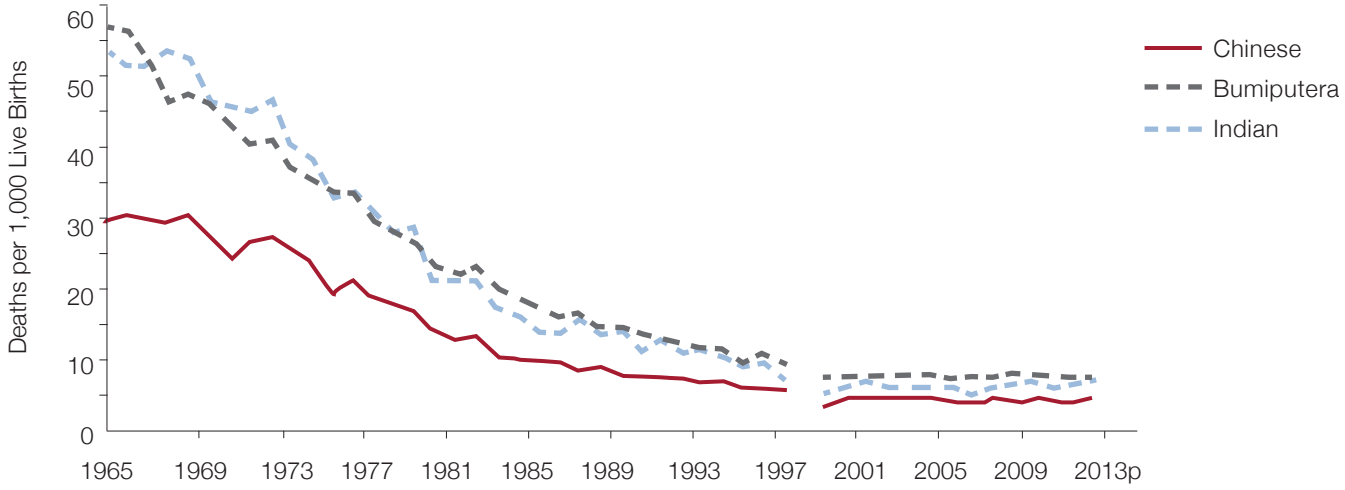
Similar disparities can be observed for infant and under-five mortality rates, which persist despite dramatic improvements in infant and child mortality among all ethnic groups. According to preliminary results from 2013, the infant mortality rate was 7.1 deaths per 1,000 live births among Bumiputera, compared to 7.3 among Indian Malaysians, and 4.4 among Chinese Malaysians (Figure 19). The under-five mortality rate was 8.7 per 1,000 live births among

Figure 18. Life Expectancy at Birth (Years), by Ethnicity, among Malaysian Males, 1980–2015



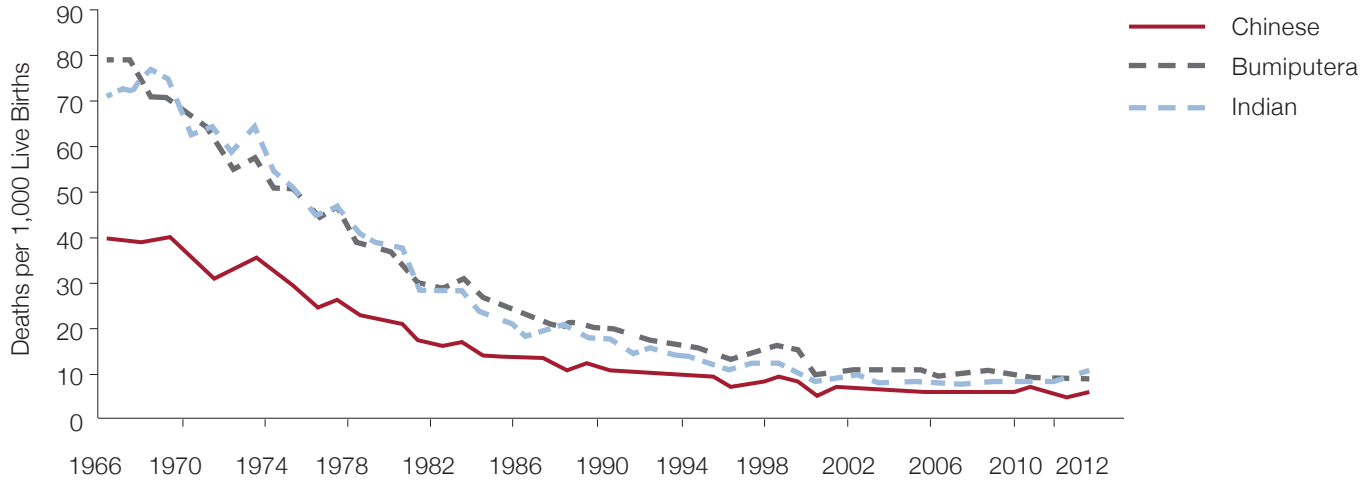
e - estimation p - preliminary
Data Source: Department of Statistics Malaysia

Figure 19. Infant Mortality Rate (per 1,000 Live Births), by Ethnicity in Malaysia, 1965–2013



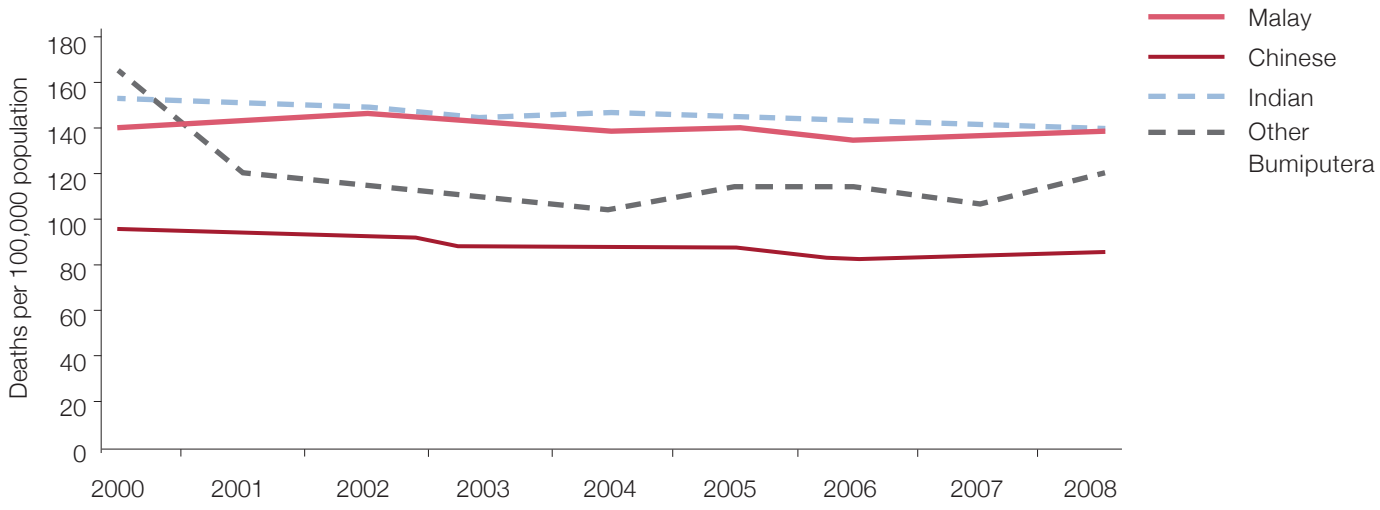
p - preliminary
Data Source: Department of Statistics Malaysia

Figure 20. Under 5 Mortality Rate (per 1,000 Live Births), by Ethnicity in Malaysia, 1966–2012



p - preliminary
Data Source: Department of Statistics Malaysia

Figure 21. Age-Standardized Mortality Rate for Avoidable Causes of Death by Ethnicity in Malaysia, 2000–2008



Data Source: Department of Statistics Malaysia

Bumiputera, compared to 9.2 for Indian Malaysians and 5.6 for Chinese Malaysians (Figure 20) [12].

Trends in avoidable mortality rates across ethnicity show similar patterns of variation. In 2008, the rate of deaths from avoidable causes was 139.4 per 100,000 population among Malays, 139.0 among Indian Malaysians, and only 83.8 among Chinese Malaysians. The avoidable mortality rate for other Bumiputera was 119.3 per 100,000 population, although this result is less reliable due to data quality issues in Sabah and Sarawak where these populations predominantly reside. In contrast to other ethnicities, there has been almost no decline in avoidable mortality among Malays over the period 2000–2008 (Figure 21) [18].

The National Health and Morbidity Surveys provide a rich dataset on population health status, which allows for examination of the distribution of risk factors and morbidity across various dimensions including socioeconomic status, ethnicity, urban/rural residence, and region. These findings are described in detail in section 4.1.2. One finding that stands out is that while there are minimal differences in risk behaviors across different socioeconomic groups (apart from smoking behaviors), wider differences are seen in morbidity patterns, especially for hypertension.

The evidence compiled by MHSR shows that there are persistent disparities in population health outcomes in terms of mortality, avoidable mortality, morbidity and prevalence of risk across Malaysia's ethnic groups, in addition to differences by socioeconomic status, with poorer populations generally faring worse. These disparities, while not solely determined by the health system, are nonetheless important to take into account when designing health system reform.

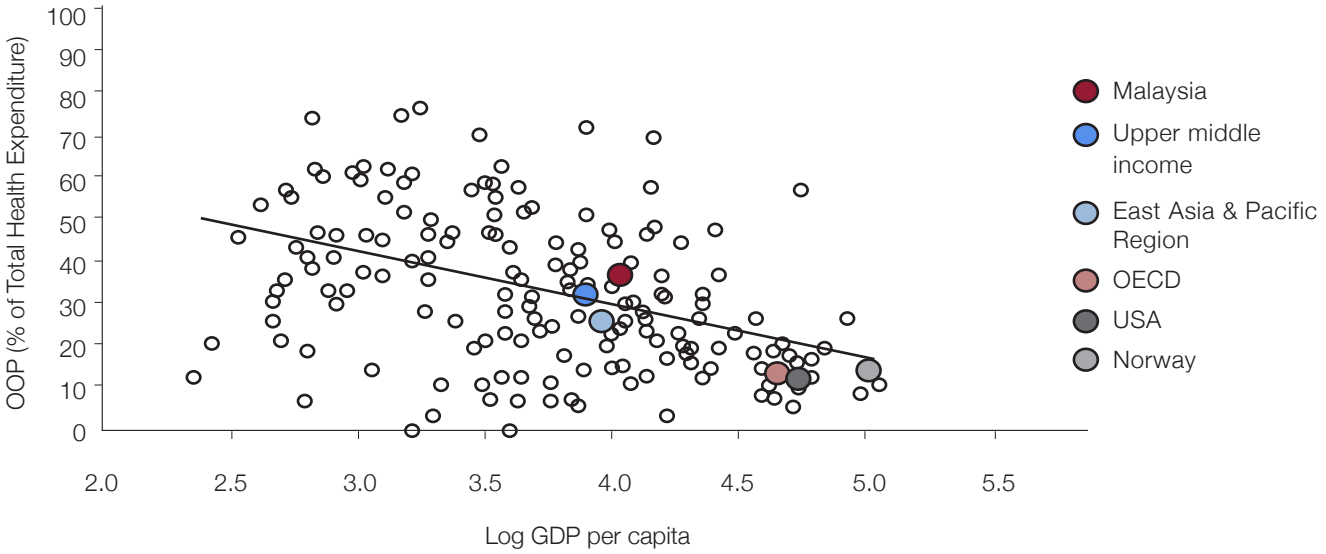
2.3. Financial Risk Protection

Financial risk protection refers to the degree to which a health system enables the population to access all needed quality health services without financial hardship. Malaysia's health system, which provides universal access to publicly provided healthcare services with only nominal user charges, is one that has prioritized financial risk protection. This prioritization is reflected in the low incidence of catastrophic health expenditures experienced by Malaysian citizens.

While analysis of financial risk protection based on 2014 Household Income and Expenditure Survey data is ongoing, the 2013 Malaysia Health Care Demand Analysis reported that only 1.44 percent of Malaysian households experience catastrophic spending of more than 10 percent of total household expenditures in any given month, based on 2009/10 data [24]. Only 0.16 percent of households faced expenditures of more than 25 percent of total household expenditures [24]. The incidence of catastrophic spending fell by more than 50 percent from 0.36 percent in 1998/99 to 0.16 in 2009/10, evidence that financial risk protection has been improving over time [24].

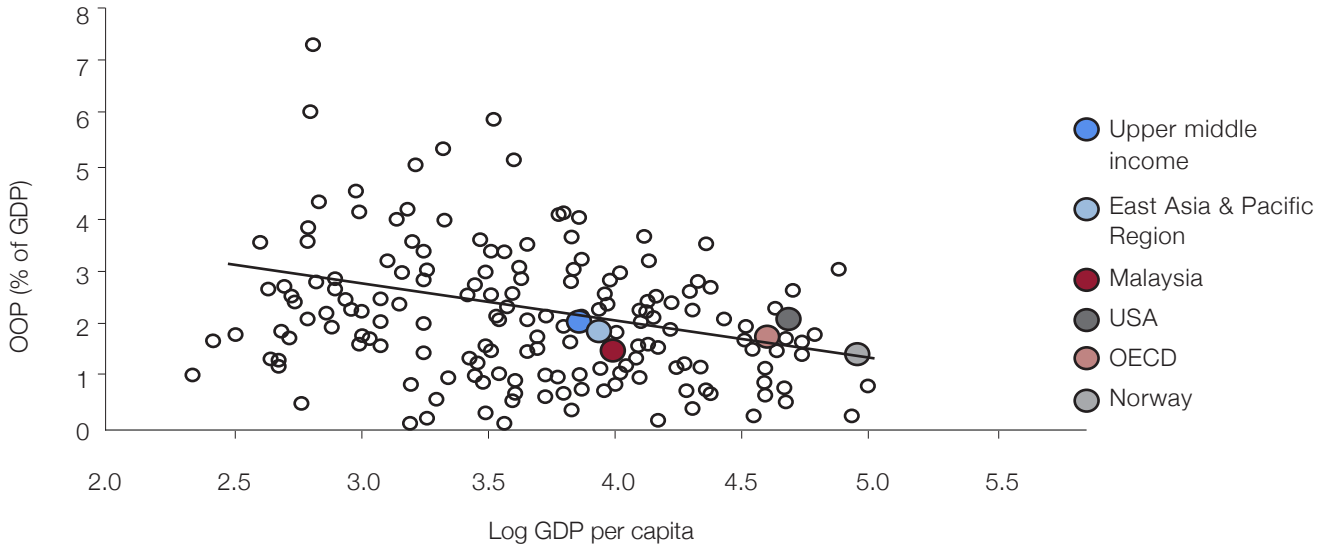
The incidence of impoverishing health expenditures—defined as health expenditures that reduce other non-health expenditures below a specified poverty line—was also found to be low in the Health Care Demand Analysis. Based on 2009/10 data, only 0.15 percent of households were pushed be-

Figure 22. Out-of-Pocket Expenditures as a Share of Total Health Expenditures Relative to per Capita Income, 2013



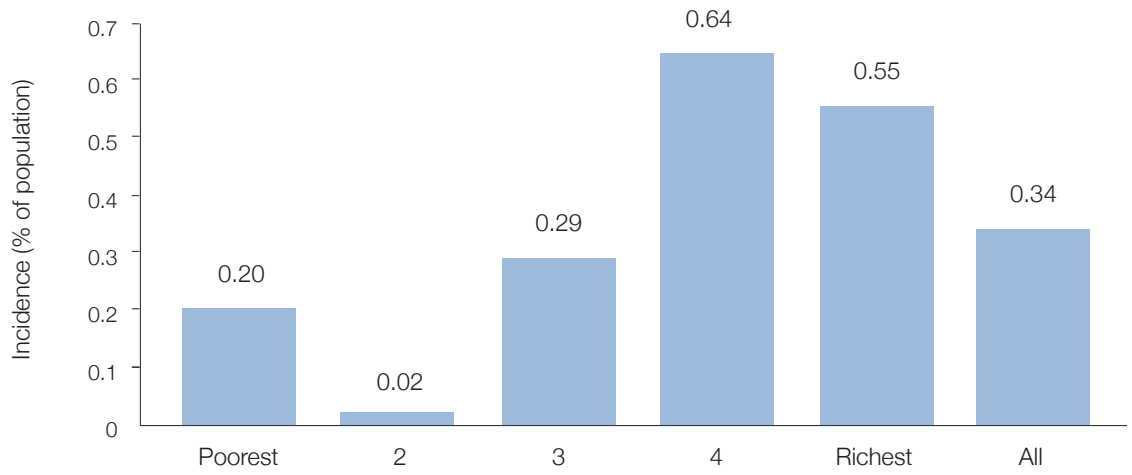
Data Source: Malaysian National Health Accounts (System of Health Accounts Framework) and World Bank Development Indicators (2013)

Figure 23. Out-of-pocket Expenditures as a Share of GDP Relative to per Capita Income, 2013



Data Source: Malaysian National Health Accounts (System of Health Accounts Framework) and World Bank Development Indicators (2013)

Figure 24. Incidence of Catastrophic Health Expenditures (Medical Expenses ≥25 of Non-Food Expenses) by SES Quintile, 2009/2010



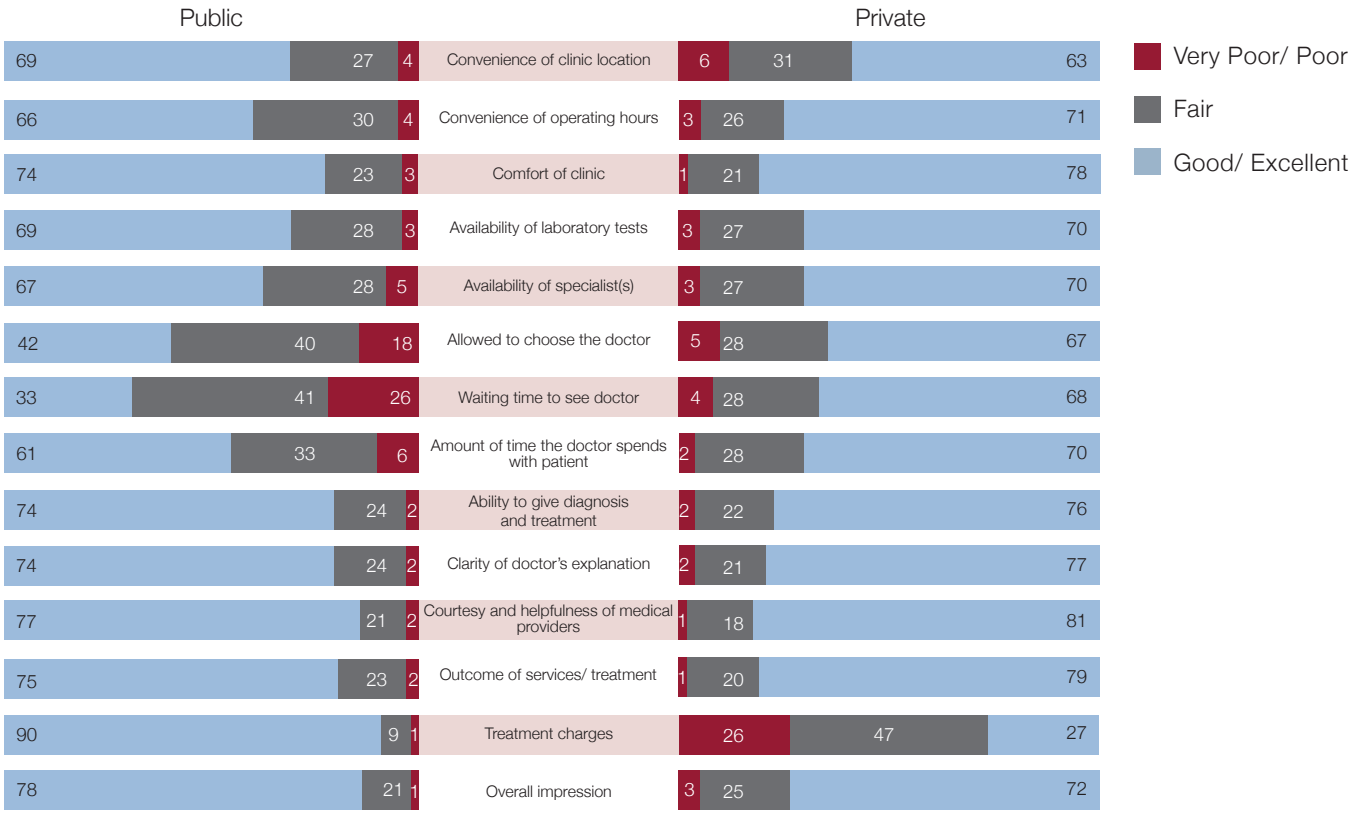
Source: Malaysia Health Care Demand Analysis (2013)

low the World Bank's $2.00 per day international poverty line in any given month, while 0.3 percent of households were pushed below official poverty lines defined by the Government of Malaysia [24].

These indicators compare favorably with other countries at all income levels. Malaysia's incidence of catastrophic expenditures is one of the lowest rates observed among all middle-income countries, and is also lower than the median rate observed for high-income countries [24]. A relatively low level of out-of-pocket expenditures as a share of GDP partly explains the strong financial risk protection afforded by the Malaysian health system. With 36 percent of health spending financed through out-of-pocket expenditures (according to internationally comparable data based on the Malaysian National Health Accounts estimates using the System of Health Accounts [SHA] framework) [25], Malaysia has a slightly higher share of out-of-pocket expenditures than would be predicted by the country's income level (Figure 22). However, out-of-pocket spending in Malaysia as a share of GDP, at 1.44 percent, is actually low and comparable to OECD countries (Figure 23) [11, 25, 26]. While the substantial share of out-of-pocket expenditures indicates potential for improving the effectiveness and efficiency of health spending (discussed in Section 5.3.1), out-of-pocket expenditures have not resulted in substantial financial risks for the population, due to low levels of absolute spending and the system's successes in providing universal access to public services.

Financial risk protection is especially effective for low-income populations in Malaysia, indicating that the public health system provides a strong safety net for the poor. Using a definition of catastrophic health expenditures of medical expenses greater than 25 percent of non-food household expenditures, the Malaysian Health Care Demand Analysis reported an incidence of 0.2 percent of households in the poorest quintile facing catastrophic expenditures,

Figure 25. Reported Satisfaction with Public and Private Clinics, 2015



Data Source: National Health & Morbidity Survey 2015

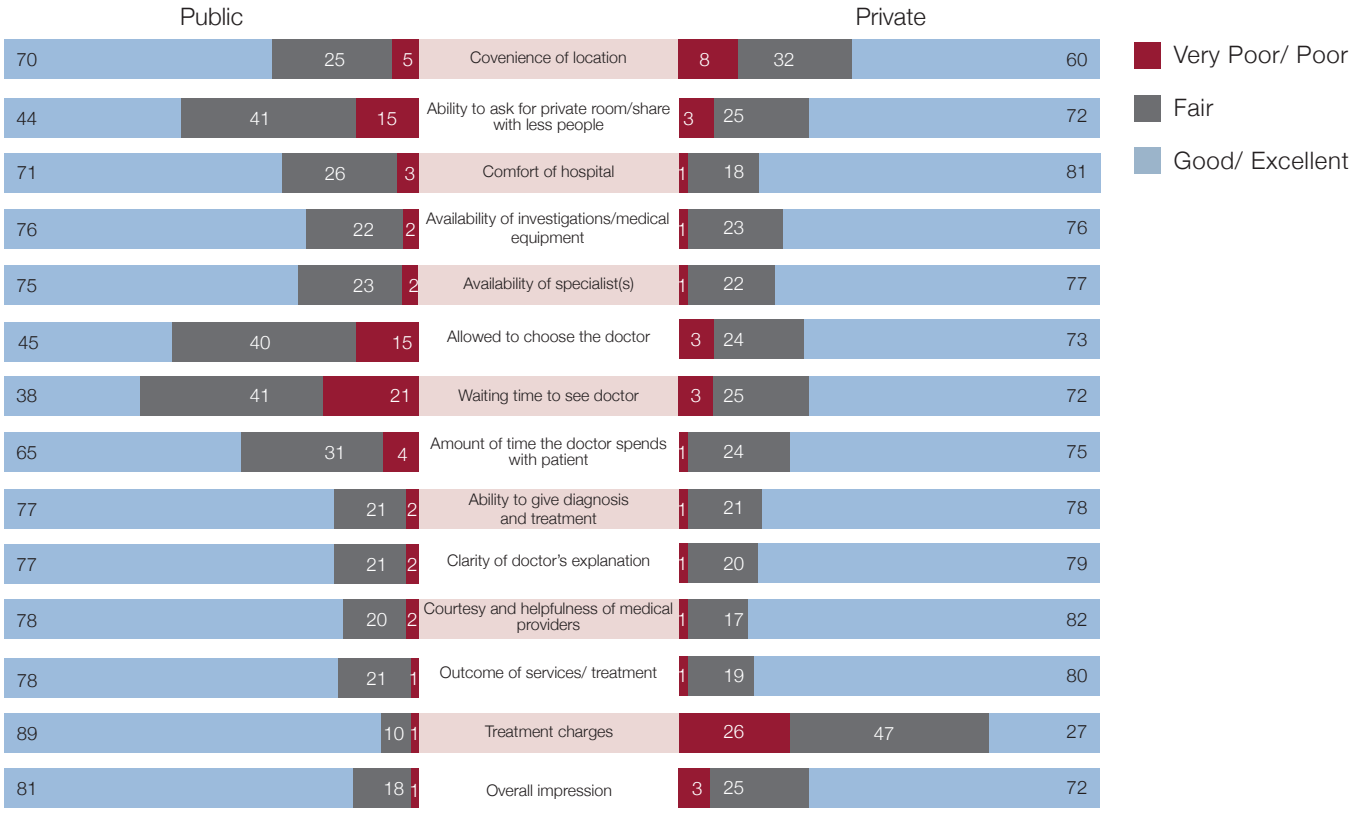
compared to 0.55 percent among the richest quintile [24].

2.4. User Satisfaction

Although it is a difficult outcome to measure, satisfaction with a health system is an important health policy objective. There are various dimensions of satisfaction, including satisfaction with particular services received (user satisfaction), and satisfaction with the access, clinical quality, responsiveness, and equity delivered by the system as a whole.

While there are no comprehensive, regularly-collected public opinion data available to shed light on satisfaction with the health system as a whole, the MHSR Political Economy and Institutional Analysis Team — which conducted interviews with stakeholders primarily within the government — found that Malaysia's system of universal access to public healthcare services, which was achieved at a relatively early stage of development, is deeply valued by the population [6]. Further analysis based on focus groups, as part of the MHSR Strategic Communications work, will provide further insights into the nature of public attitudes toward the health

Figure 26. Reported Satisfaction with Public and Private Hospitals, 2015



Data Source: National Health & Morbidity Survey 2015

system.

Both the Satisfaction and the Primary Health Care Analytic Teams examined aspects of public and user satisfaction with healthcare services. The key data source for the Satisfaction Analytic Team is the Community Perceptions module of the NHMS survey, which provides results representative at the population level on levels of satisfaction with different aspects of care for both public and private clinics and hospitals. The analysis reveals that the overall impression of health services is positive for both public and private sectors, while public facilities (clinics and hospitals) are rated slightly higher than private sector facilities (Figures 25 and 26). While public and private facilities are rated similarly across most dimensions of service quality and patient experience, public facilities are rated lower on the dimensions of choice of doctor, waiting time, and time spent with doctor, while private facilities are rated lower on the dimension of treatment charges. In addition, factors such as privacy (i.e. the ability to choose a private room or share with fewer people) and comfort are rated lower for public facilities (Figures 25 and 26) [27]. The public's overall positive impression of government services—despite concerns

about aspects of service quality—reinforces that universal access to government healthcare services is a source of satisfaction with the health system.

Further analysis of satisfaction by subgroups reveals that urban populations, Chinese Malaysians, and high-income populations rate satisfaction with private services higher compared to public services, although these differences are not large [27]. However, dissatisfaction with the consumer aspects of public services, such as waiting times, doctor choice, and amenities increases most substantially with income. These findings match observed differences in utilization patterns across population subgroups [23].

The analysis of patient satisfaction carried out by the Primary Health Care Analytic Team focused on user perceptions of responsiveness in public clinics, and findings are described in more detail in Section 3.2.2 [28]. The findings further support the conclusion that satisfaction with public services is high, although this analysis only represents users of MOH clinics and not the population as a whole, and hence may present an incomplete picture.

While further analysis of public perceptions of the health system and attitudes toward health system reform is ongoing, initial findings suggest high levels of satisfaction with the Malaysian health system. However, there are aspects of the system that people are less satisfied with, including process-related quality of health services (such as the availability of a private room or choice of a doctor) in the public sector (a dissatisfaction that increases with income levels), and the cost of health care services in the private sector. Maintaining overall public satisfaction with the health system, while addressing some of these sources of discontent, is an important objective for health system reform.

3. Health System Performance: Intermediate Outcomes

Translating health system inputs into improvemnts in the ultimate outcomes of population health, financial risk protection, and citizen satisfaction requires strong performance on several intermediate performance dimensions. These intermediate outcomes include providing broad and equitable access to health services—with appropriate levels of utilization by the population, delivering high quality services in terms of clinical effectiveness, and providing responsive, patient-centered healthcare services. Furthermore, all health systems operate in a context of resource constraints, and achieving the best possible outcomes requires efficient use of resources, in terms of both how resources are allocated across different possible uses (allocative efficiency), and whether inputs are used in the most efficient way to produce the maximum quantity of outputs (technical efficiency). This section of the report summarizes MHSR findings on how the Malaysian health system performs with respect to these intermediate outcomes.

3.1. Access

3.1.1. Physical Access

The foundation of the Malaysian health system is a geographically widespread public healthcare delivery system, which is designed to provide meaningful access to healthcare services to the entire population, regardless of geographic location. This widespread access is achieved through a network of 2,871 MOH clinics and 150 public (MOH and non-MOH) hospitals, which are distributed across the country, including in rural and remote areas (which are also served by mobile clinics).

The private sector has also developed and evolved alongside the government delivery system, and as of 2014, private facilities included 6,978 clinics (most of them individual practices) and 267 private hospitals. In the same year, private hospitals accounted for 26 percent of all acute hospital beds in Malaysia, compared to only 12 percent in 1990. In contrast to public facilities, private facilities tend to be concentrated in urban areas. This geographic variation in location of private services leads to differences in the overall supply of facilities as well as the public-private mix across states, discussed further in Sections 5.2.2 and 5.2.3 [23].

The relatively even distribution of public services means that physical access to services is good. Network analysis based on 2014 geographic information systems (GIS) data on health facilities reveals that 68 percent of the Malaysian population lives within 30 minutes driving time of a type 1-3 MOH health clinic (see Section 5.2.2 Table 6), which are clinics equipped with on-site laboratories, radiology units, and pharmacies that can provide comprehensive primary health care services. However, several states have substantially lower levels of access to type 1-3 MOH health clinics, including Kelantan (54 percent within a 30-minute drive of type 1-3 clinic), Terengganu (36 percent), Sarawak (35 percent), Sabah (23 percent), and Pahang (19 percent) [23].

Similarly, access to basic secondary and tertiary

health services is good, with 73 percent of the national population living within 30 minutes driving time to a public general acute hospital. However, in Pahang and Sabah, only roughly one-third of the population lives within a 30-minute drive of a general acute hospital [23]. Access to more advanced, specialized services is somewhat more variable. For example, 63 percent of the population lives within a 60-minute drive from a public facility with a cardiac catheterization lab capable of providing percutaneous coronary intervention (PCI) for treatment of myocardial infarction (heart attack), but only 36 percent of the population lives within 50 minutes of a public radiotherapy center, as there are only five public radiotherapy centers in the country. This means that patients requiring radiotherapy must often travel long distances to access care, although the MOH also pays for radiotherapy at private facilities where these are more accessible [23]. Lower levels of access to some specialized services are related to limited availability of high-end technology in the public sector and limited capacity of people to pay for such services in the private sector, factors which are reflected in extremely low rates of utilization of such services compared to OECD countries.

Overall, the Malaysian health system provides reasonably good levels of physical access to health services for the majority of the population, in particular for maternal and child health services and general acute hospital services. Nonetheless, there are gaps—especially for more advanced services required to treat the rising tide of NCDs and their complications, and particularly in less densely populated areas.

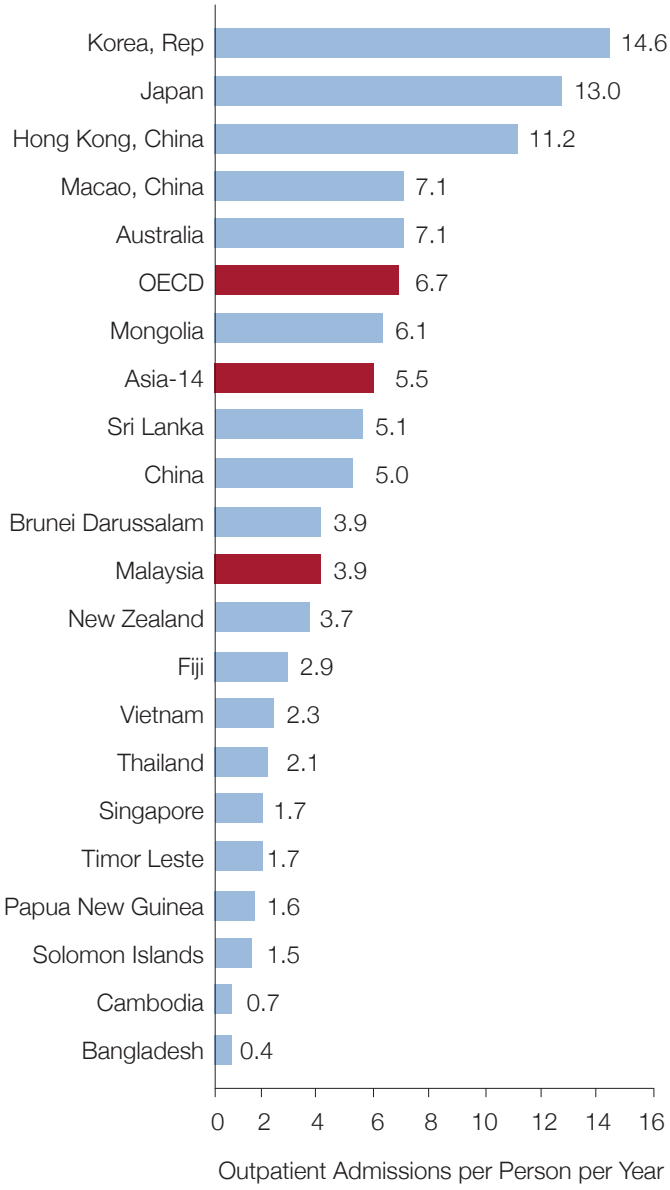
3.1.2. Utilization

To achieve health system outcomes, it is important for the population to have physical access to health services and also to be able to adequately and appropriately utilize these services. Factors that affect utilization patterns include patient health seeking behavior, patient preferences, financial access, socio-cultural norms, epidemiology, and health system responsiveness, among others. Analysis of health system utilization is based on self-reported outpatient and inpatient utilization in the NHMS 2015 survey.

Outpatient utilization—measured as the number of outpatient consultations per year—is in the mid- to low-range relative to regional and OECD country comparators (Figure 27), at 3.9 doctor visits per person per year based on NHMS data (adjusted for underreporting). Of these, 60 percent of visits are in public facilities, while 40 percent are in private facilities [29]. Malaysia has similar levels of outpatient utilization to New Zealand (3.7 visits), but lower utilization compared to Australia (7.1 visits) and to the OECD average (6.7 visits) [30]. These data are not age-standardized, which means that the disparities with the mostly older OECD countries are not as great as suggested by these numbers.

Between 2011 and 2015, there was an almost 50 percent decline in self-reported private sector outpatient utilization as reported in the NHMS, from 2.1 private sector visits per person to 1.1 visits per person (unadjusted for underreporting). Public utilization increased slightly over the same period, from 2.0 self-reported visits per person to 2.1 visits [29]. Even allowing for possible overestimation of the decline

Figure 27. Outpatient Visits per Capita, Adjusted Malaysia NHMS 2015 Estimates Compared to OECD Estimates for Asia-Pacific and OECD Countries, 2013



Data Source: National Health and Morbidity Survey (2015) & OECD Asia-Pacific Health at a Glance Database (2014)

because of sampling errors in the NHMS surveys, the reasons for the decline in overall utilization—due to the decline in private sector utilization—are unknown and require further analysis.

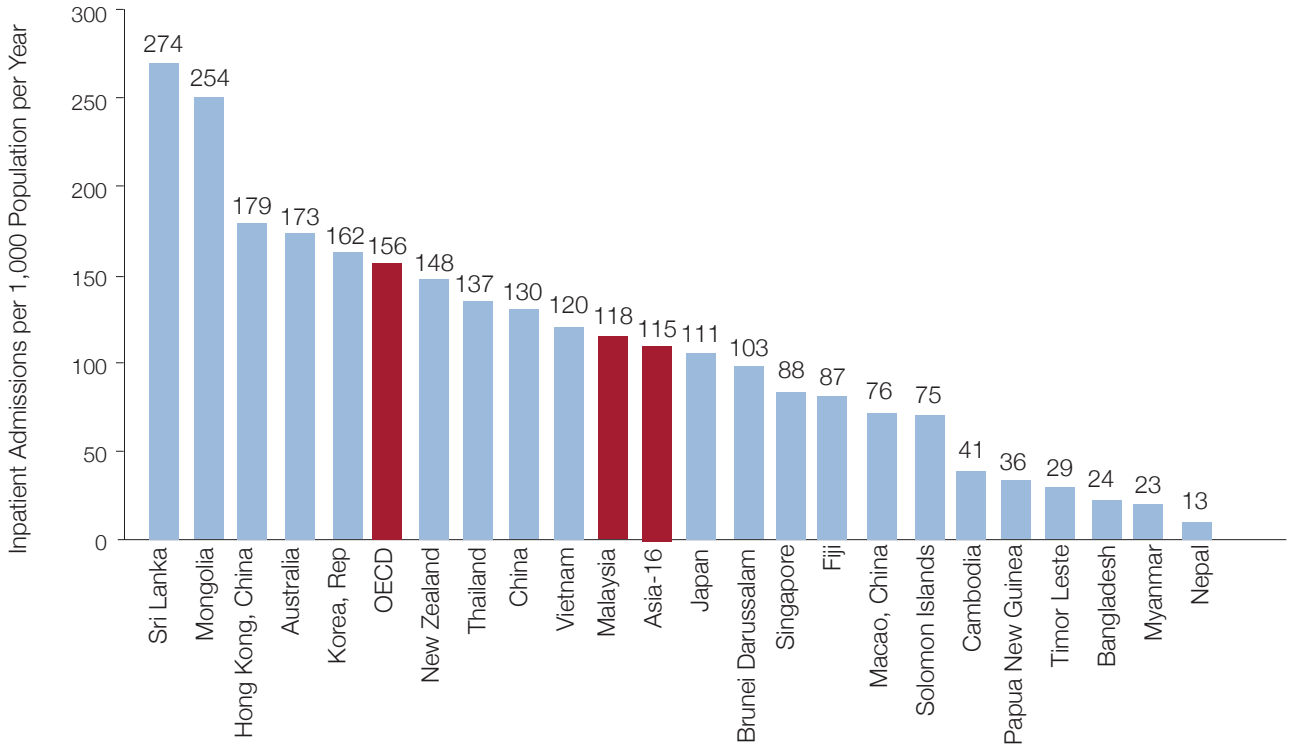
Poorer Malaysians are more likely to utilize the public sector for outpatient care: 68 percent of outpatient visits are in the public sector among the poorest quintile, compared to only 41 percent in the richest quintile [29].

Inpatient utilization is generally measured as the annual number of admissions (or discharges) per 1,000 population. Based on NHMS 2015 data adjusted for underreporting, Malaysia's rate of discharges was 118 per 1,000 population in 2015 [29], which is similar to the regional average and lower than the OECD average (Figure 28) [30]. Given that Malaysia's population, though ageing, is younger compared to the average OECD country (and would hence be expected to have lower levels of chronic illness and disability related to ageing), substantially lower hospital inpatient utilization would be expected.

From 2011 to 2015, there was a slight increase in self-reported inpatient utilization, from 85 admissions per 1,000 population to 101 (unadjusted for underreporting). The share of public sector utilization is higher for inpatient care than for outpatient, with 77 percent of admissions in the public sector. As expected, there is a strong income gradient for the public sector share of utilization, with 93 percent of patients in the poorest quintile utilizing public services compared to only 42 percent of patients in the richest quintile [29].

This analysis of health system utilization reveals two important findings. First, Malaysia's health system

Figure 28. Hospital Admissions per 1,000 Population, Adjusted Malaysia NHMS 2015 Estimates Compared with OECD Estimates for Other Asia-Pacific and OECD Countries, 2013



Data Source: National Health and Morbidity Survey (2015) & OECD Asia-Pacific Health at a Glance Database (2014)

utilization remains toward the low end compared to high-income countries. While this finding cannot be used to indicate under or over-performance relative to OECD countries as the utilization levels are not case mix-adjusted to control for age or morbidity levels, it does suggest that utilization levels will increase with time to mirror those in OECD countries, putting pressure on the health system and increasing expenditures. Second, public sector healthcare services are pro-poor, as a greater proportion of higher-income Malaysians opt to receive health care in the private sector.

3.2. Quality

3.2.1. Effectiveness and Comprehensiveness of Care

Translating access to and utilization of healthcare services into improved health outcomes requires delivering care that is comprehensive and effective, based on the highest quality clinical evidence. Under the MHSR project, various analyses were conducted to assess the clinical quality of care—covering aspects of both effectiveness and comprehensiveness. Analysis of patient safety would also be valuable, but data are limited.

Primary Care Quality

First, we examine the question of whether patients presenting for primary care in Malaysia receive effective, evidence-based care. The Quality of Care Analytic Team assessed the clinical quality of outpatient primary care in Malaysia using the RAND Quality of Care methodology, which has primarily been used for quality of care assessment in the United States, Europe, and Australia. The RAND approach focuses on process quality, defined as whether physicians provide the 'right' care based on evidence-based clinical guidelines of what improves clinical outcomes. The analysis used data from the National Medical Care Surveys (NMCS) of 2012 and 2014, which covered large, representative samples of patient visits in both MOH and private clinics [31]. The 2012 survey was a pilot study in three states (Wilayah Persekutuan Kuala Lumpur, Selangor, and Kelantan) and two regions (Kota Kinabalu and Kuching), while NMCS 2014 was a national study. A summary of the findings is provided below.

In total, using the NMCS data it was possible to replicate 66 indicators for quality of care. More than half of these indicators assessed the effectiveness of prescribing, given the nature of the NMCS data, while the others assessed quality of investigation, advice given to the patient, and procedural aspects of care. The 66 indicators covered 24 different conditions in 2014, including acute conditions, chronic conditions, and others [31].

Overall quality of care scores were 56.5 percent in 2014 and 56.9 percent in 2012, meaning that patients received around 57 percent of recommended care. These estimates are close to aggregated quality of care estimates found in the United States and Australia, which range from 55 to 57 percent, although the estimates are not strictly comparable due to differences in the set of indicators used and patient case mix. The Malaysian data are likely to be more skewed toward less resource intensive indicators (based on the nature of the data available in the National Medical Care Survey) than the data used in the United States and Australian reference studies, meaning that the Malaysian estimates are not directly comparable to the international studies [31]. Nonetheless, this analysis provides suggestive evidence that clinics in Malaysia provide a reasonable level of evidence-based services to patients who present for care in the public and private sectors.

Both public and private sectors scored higher on process of care indicators for acute conditions (58.0 percent) compared to chronic conditions (51.9 percent). In 2014, a statistically significant difference in the quality of care between the public and private sectors was found, with an overall score of 59.3 percent for public clinics compared to 53.1 percent for private clinics. The public sector outperformed the private sector on indicators covering both acute conditions (65.3 percent compared to 51.4 percent) and chronic conditions (55.5 percent compared to 47.2 percent). The differences observed between the public and private sectors were driven by higher quality of prescribing in the public sector (93.0 percent compared to 79.4 percent), for example prescribing the correct drug and not prescribing unnecessary drugs (Table 3). A similar level of difference in the quality of prescribing was found using the 2012 data, although this observed difference in prescribing did not translate into a significant overall difference in care quality between the public and

private sectors. In both sectors, quality scores were lower for indicators of more resource-intensive care, suggesting that resource limitations play a role in the quality of services provided [31].

To further assess the quality of care for specific conditions in the public sector, analytic teams from the National University of Malaysia and the MOH analyzed data from administrative databases available to the MOH. The analysis was based on the United Kingdom's Quality and Outcomes Framework [32] and assessed quality using indicators for tracer conditions, namely antenatal care, child health, diabetes, hypertension, and asthma. It is important to note that the administrative data sources used in the analysis vary in their representativeness of the patient population, and are not representative of the population as a whole. For example, the analysis of care for chronic illness focused on clinical effectiveness, whereas the analysis of antenatal and child health focused on comprehensiveness/coverage of the health services provided [33].

To assess the quality of diabetes management, the

Table 3. Performance Indicator Scores by Type of Condition, Modality of Care, and Resource Intensity, 2014

Category	Indicators, n	Public Sector			Private Sector			Difference (95 percent CI)
		Patients, n	Eligible events, n	Mean score, percent	Patients, n	Eligible events, n	Mean score, percent	
Overall	66	7,571	37,435	59.3	7,626	30,025	53.1	6.3 (3.4 to 9.1)***
Type of Conditions								
Acute	38	2,979	3,702	65.3	2,979	4,092	51.4	13.9 (8.4 to 19.3)***
Chronic	25	4,501	30,230	55.5	4,501	22,197	47.2	8.3 (4.2 to 12.3)***
Others	3	1,860	3,503	86.2	2,032	3,736	89.7	-3.5 (-7.7 to 0.8)
Modality of Care								
Investigation	15	232	325	45.9	399	432	46.2	-0.3 (-16.6 to 16.0)
Prescribing	39	6,247	22,706	93.0	6,632	19,085	79.2	13.9 (11.2 to 16.6)***
Procedural	5	29	29	49.6	118	119	40.7	8.9 (-20.9 to 38.6)
Advice	9	5,096	14,379	6.4	4,012	10,444	5.6	0.8 (-1.5 to 3.2)
Resource Intensity								
Low	26	6,193	17,133	93.1	6,406	15,195	84.1	9.0 (6.1 to 11.9)***
Medium	15	3,773	5,755	92.0	3,014	3,664	69.6	22.4 (18.0 to 26.8)***
High	25	5,169	14,547	6.5	4,471	11,163	5.4	1.2 (-1.1 to 3.5)

Data Source: National Medical Care Survey
Note: Weighted for age, gender and types of conditions. Significance of difference indicated by *P<0.05, **P<0.01, ***P<0.001.
95% confidence interval calculated using bootstrapped standard error.

analytic teams used data from the National Diabetic Registry, which covers approximately one-third of all diabetic patients receiving care at MOH facilities; hence these estimates are only representative of MOH patients, a group which may achieve better control than diabetic patients not receiving care through the MOH, according to NHMS data [23]. The analysis revealed that 54.8 percent of diabetic patients included in the Diabetic Registry achieved the blood pressure target (<=140/80mmHg), 52.6 percent achieved the total cholesterol target (<=5mmol/L), and 54.0 percent achieved the HbA1c target (<=7.5mmol/L). These results are comparable to results found in Latin American countries, but are lower than comparable results from the United Kingdom, United States, and Canada [33]. In terms of processes of care for diabetes, analysis by the analytic teams found that between 53 percent and 77 percent of diabetic patients received recommended screening for diabetic complications [33].

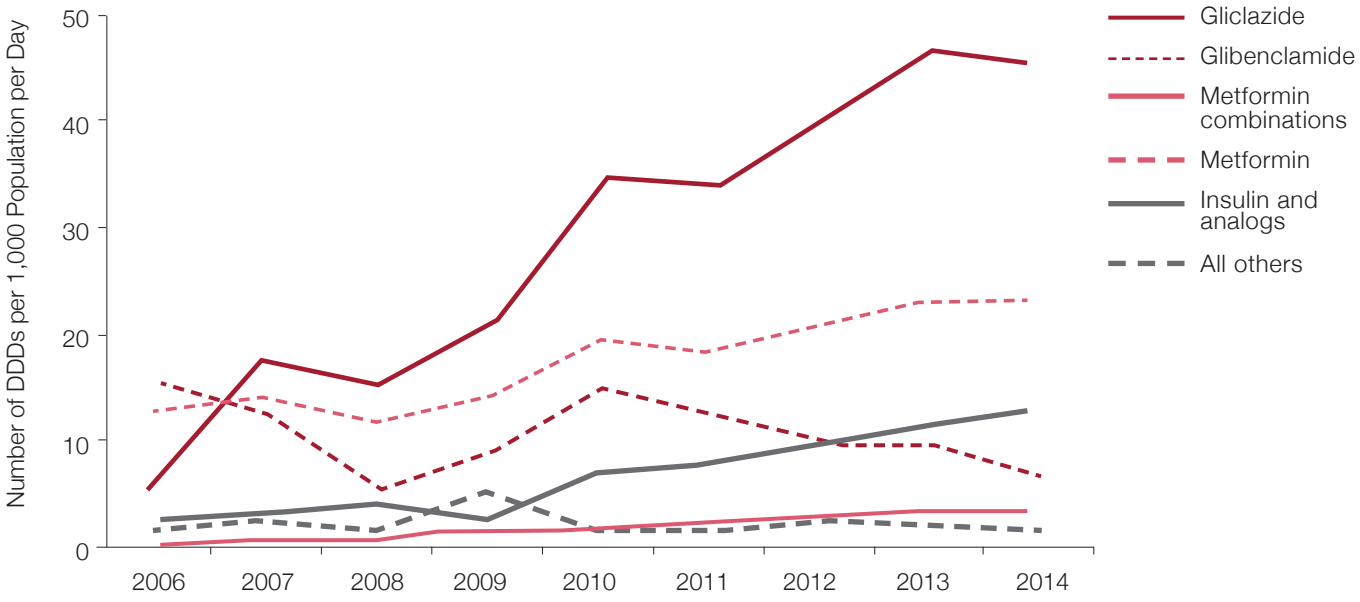
Using population-representative data from the NHMS 2015 survey on blood glucose levels (a different measure of control), the MHSR analysis found that 38.1 percent of diagnosed diabetics had controlled disease in the public sector compared to 35.5 percent in the private sector, based on a definition of control of fasting blood glucose in the range of 4.0–6.1 mmol/L or non-fasting blood glucose in the range of 4.4–8.0 mmol/L) [23]. These findings cannot be directly compared to the findings based on the National Diabetic Registry due to the different definitions of control used and the different populations covered.

Analysis of the quality of hypertension management was based on data from the Tele-Primary Care database, which is not representative of the population or those with hypertension as it includes only a small proportion of hypertensive patients receiving care in MOH facilities. The finding of the analysis was that around half of patients achieved the target control of blood pressure <=140/90mmHg, which compares favorably to other middle-income countries, but is lower than the levels of control achieved by some high-income countries [33]. These results should be interpreted as being suggestive given the limited representativeness of Tele-Primary Care data. Using NHMS 2015 data, the MHSR analysis estimated a lower share—42.5 percent—of diagnosed hypertensive patients achieving target control, with the proportion slightly higher (44.1 percent) for patients attending public clinics compared to private clinics (39.0 percent) [23].

The analysis of medicine utilization conducted by the Medicines Analytic Team is also informative of the clinical quality of care in Malaysia. For example, one finding is that the use of medications to treat diabetes in the public and private sectors may be less than optimal. Analysis of trends in utilization for Type 2 diabetes between 2006 and 2014 using numbers of Defined Daily Doses (DDD)[4] reveals that the utilization of Glibenclamide fell after 2006, but Glibenclamide was substituted more by increased supply of Gliclazide rather than increased supply of Metformin (Figure 29), which would generally be better choice for diabetic patients given the high levels of obesity among patients with Type 2 diabetes in Malaysia. This finding suggests the possibility of less than optimal prescribing for

[4] The Defined Daily Dose is the measure recommended by WHO as a standard comparable measure for medicines utilization analysis. A DDD is defined as the assumed average daily mantenance dose for a drug used for its main indication in adults.

Figure 29. Selected Drugs Used to Treat Type 2 Diabetes Mellitus in Malaysia by Defined Daily Dose, 2006–2014



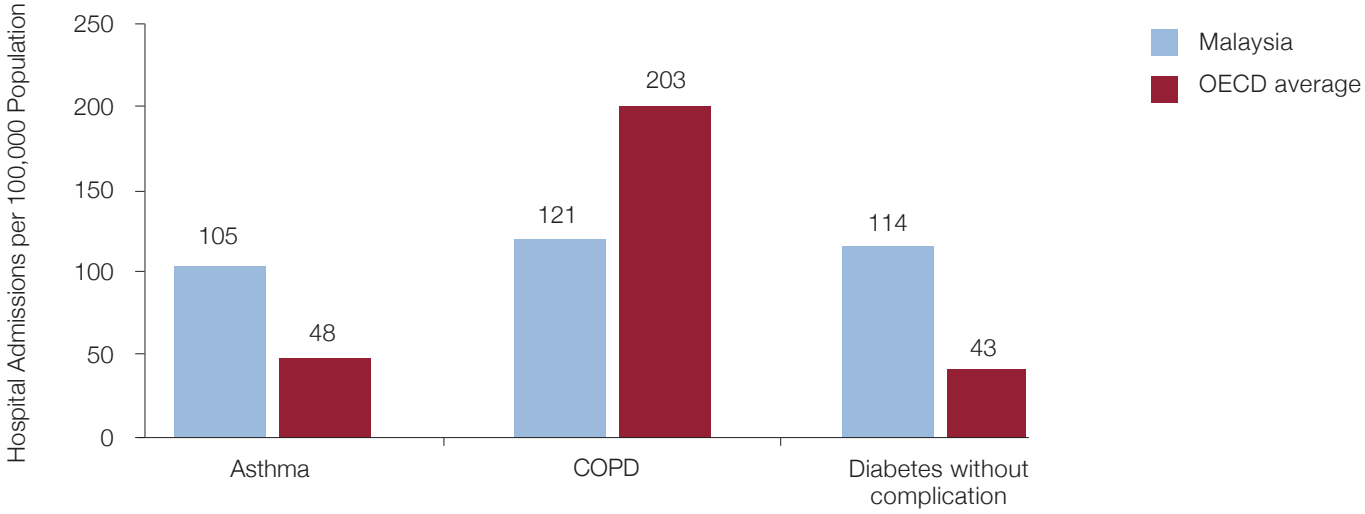
Data Source: National Medicines Use Survey 2006–2010, IMS 2010–2014

Type 2 diabetes, although further empirical work is needed to better understand the quality of prescribing in Malaysia and to develop a system of prescribing audit [34].

The analysis of the incidence of hospital admissions for conditions that can be managed at primary care level, conducted by the Admissions Analytic Team and covering both MOH and private hospitals, is also informative of the quality of care delivered at primary care level.

Compared to OECD countries, admissions rates for asthma and diabetes are very high in Malaysia. These chronic conditions are regarded as being sensitive to primary care performance, with high rates of hospital inpatient admission suggestive of poorly performing primary care in this area. In contrast, admission rates for chronic obstructive pulmonary disease (COPD) and congestive heart failure are relatively low. The low level of COPD admissions likely reflects low levels of smoking, the key risk factor for this condition. The low level of admissions for congestive heart failure may reflect coding guidelines in which a non-etiology specific code such as congestive heart failure is not used as the primary diagnosis when a more specific cause can be identified. Overall, the analysis of admission patterns for ambulatory care-sensitive conditions indicates that chronic conditions are not being effectively managed in the health system, resulting in high levels of preventable admissions [35]. The finding of high hospital inpatient admission rates for common NCDs is further supported by analysis by the Secondary and Tertiary Health Care Analytic Team showing that 15–20 percent of hospital admissions in Malaysia (public and private sectors) are

Figure 30. Hospital Admissions for Selected Conditions, Malaysia and OECD Average, 2011



Data Source: Analysis based on SMRP (2011), HIMS Private Hospitals Subsystem (2011), Department of Statistics Malaysia (2011) and OECD (2011)

for ambulatory care-sensitive conditions (see Table 9, Section 5.2.3).

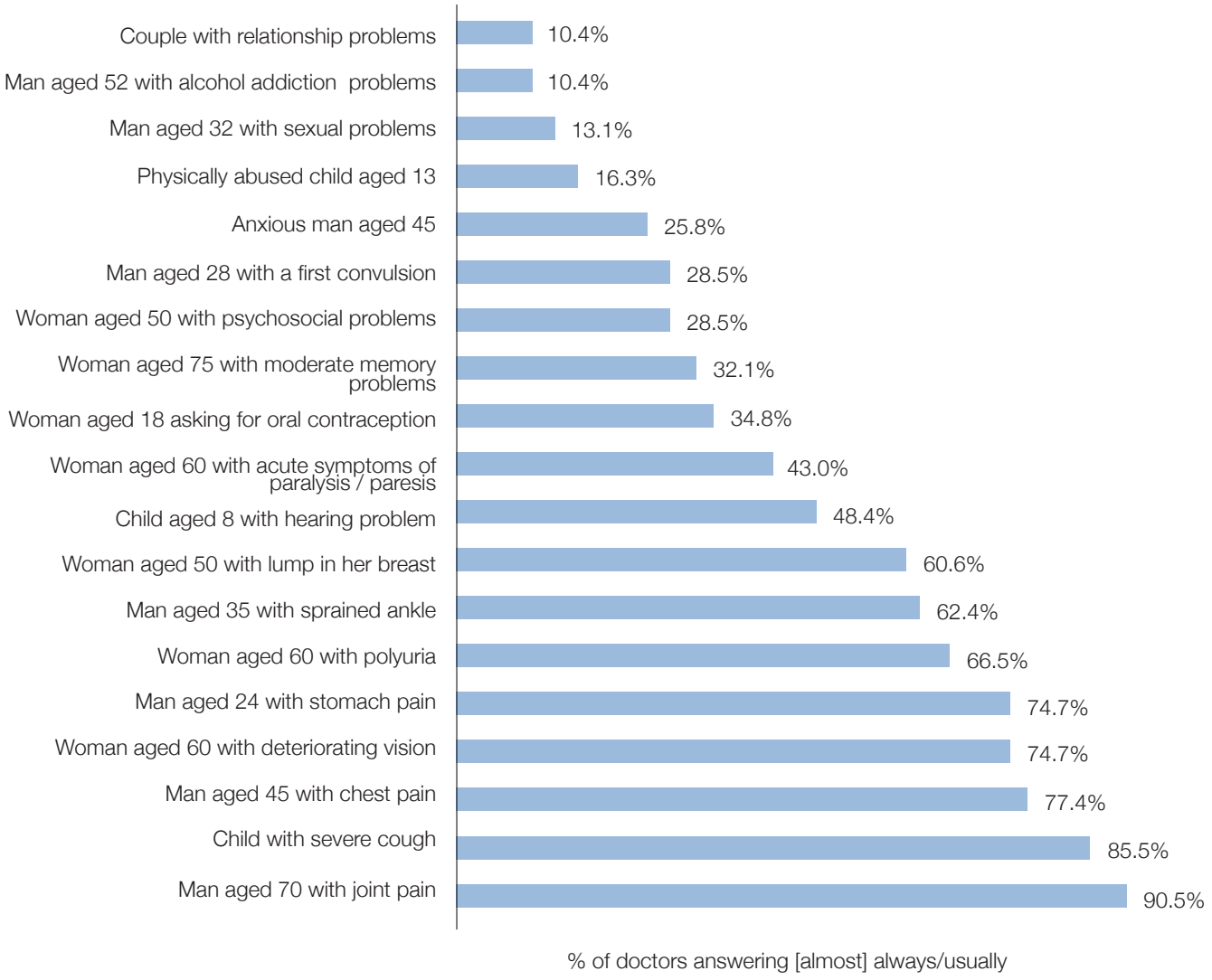
In addition to effectiveness of care (whether patients who present for care receive the 'right care'), an important dimension of clinical quality is the comprehensiveness of care, or whether the patient population receives all the care that clinical evidence suggests could improve outcomes. An important data source for comprehensiveness of care provided by MHSR is the Quality and Costs of Primary Care in Europe (QUALICOPC) survey, which has been used in more than 30 countries worldwide [36] and was adapted to the Malaysian context and applied at a representative sample of MOH clinics. The survey sample included 221 MOH primary health care (PHC) clinics in five states (Kelantan, Sabah, Sarawak, Selangor, and Federal Territory of Kuala Lumpur), sampled using random proportionate sampling and stratified by urban/rural location. Both doctors and patients were surveyed in each PHC clinic. The analysis is informative of the comprehensiveness of care delivered to patients presenting in public clinics, with an emphasis on rural clinics, which made up 54 percent of the sample [28].

The analysis of comprehensiveness of PHC services using QUALICOPC data reveal several important strengths as well as limitations in the comprehensiveness of care provided in public PHC clinics. The survey reveals that there are opportunities for improvement in PHC. First, primary care doctors were not identified as the first point of contact for many common conditions—especially for mental illness (e.g. depression and anxiety), addictions, and substance abuse, with only one quarter or less of public clinic doctors indicating they were (almost) always or usually consulted on a first contact basis for mental illness (Figure 31). This finding may also reflect health seeking behavior of patients rather than the capacity

of clinics to provide these services. For conditions where primary care providers could and should play a critical screening and diagnostic role—such as hearing problems in a child, a breast lump in a middle-aged woman, and memory problems in an elderly woman, only about 30-60 percent of public clinic doctors indicated that they were (almost) always or usually consulted on a first contact basis [28].

Second, doctors in public clinics were not deeply involved in comprehensive follow-up of a wide range

Figure 31. First Contact Functions Undertaken by Primary Health Care Doctors at MOH Clinics, 2015



Data Source: QUALICOPC Malaysia (2015)

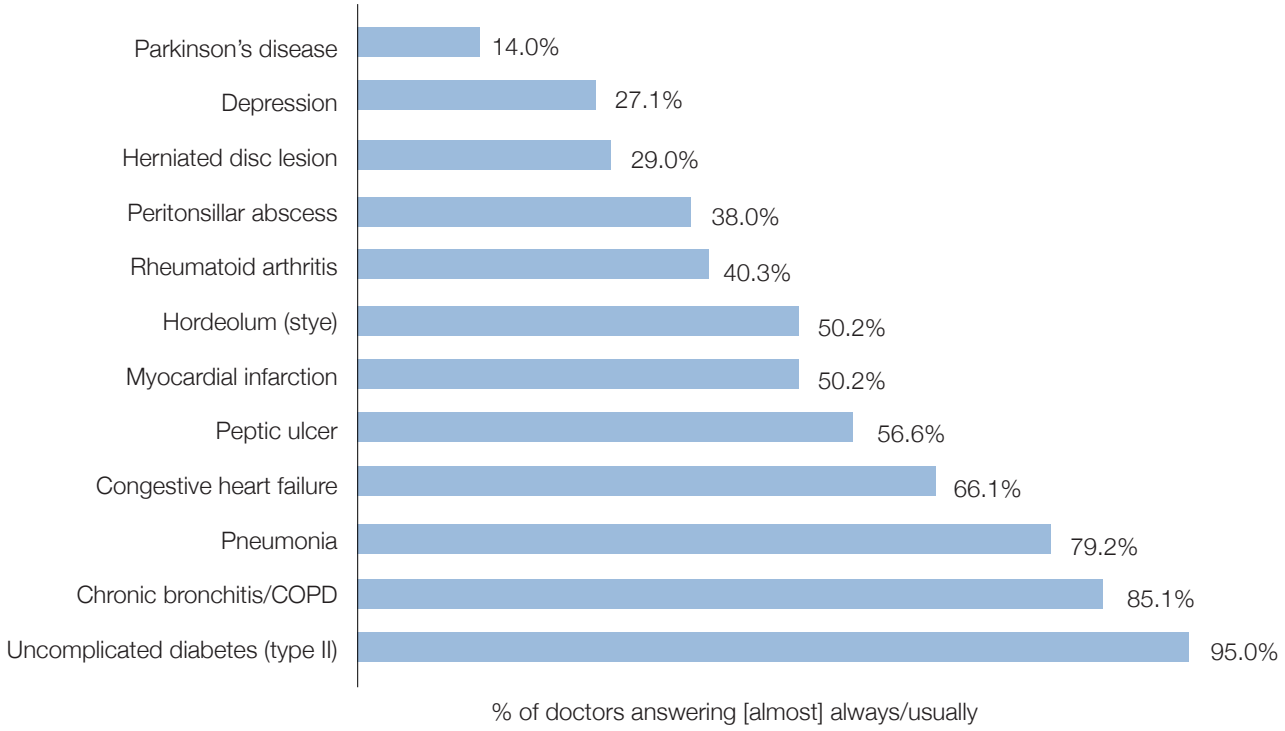
Question text: "In case of the following health problems, to what extent will patients in your practice population (people who normally apply to you for primary medical care) contact you as the first health care provider? (This is only about the first contact, not about further diagnosis or treatment)."

of primary care sensitive conditions, especially mental illness and other NCDs. For example, only 27 percent of public clinic doctors indicated they were (almost) always or usually involved in the follow-up of depressed patients and only 50 percent and 57 percent were involved in the follow-up care of patients with myocardial infarction and peptic ulcer disease (Figure 32) [28].

Third, continuity of care between specialists and primary care providers is weak, as clinic doctors are seldom or never (50 percent), or only occasionally (31 percent), informed after a patient has been treated or diagnosed by a specialist (Figure 33). The finding that clinic doctors are not deeply involved follow-up care for many conditions indicates further the lack of care continuity among providers [28].

Furthermore, medical officers do not regularly carry out many medical and surgical procedures that a well-functioning primary care facility with a comprehensive set of services would typically provide. For example, more than 99 percent of clinic doctors reported that they would only occasionally or never carry out joint injections and 84 percent reported that they would only occasionally or never remove sebaceous cysts (Figure 34) [28]. Together, these findings suggest that the primary care services delivered at

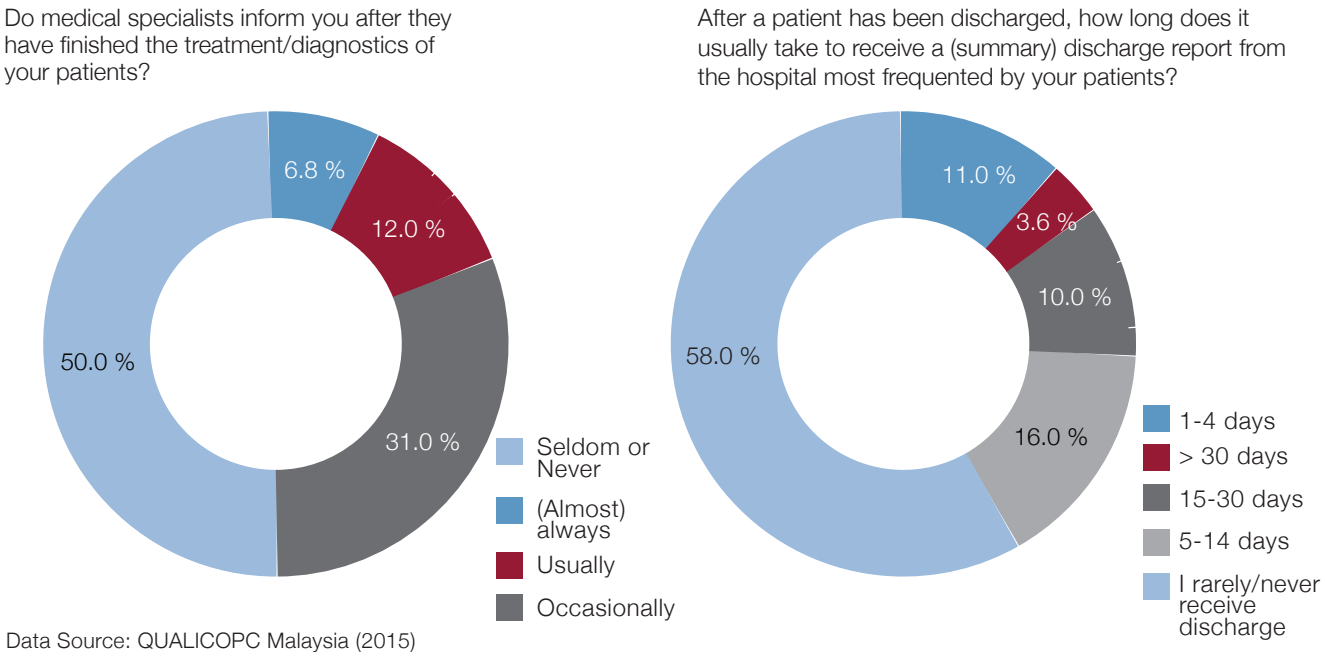
Figure 32. Follow Up of Conditions by Primary Health Care Doctors at MOH Clinics, 2015



Data Source: QUALICOPC Malaysia (2015)

Question text: "To what extent are you involved in the treatment and follow up of patients with the following diagnoses?"

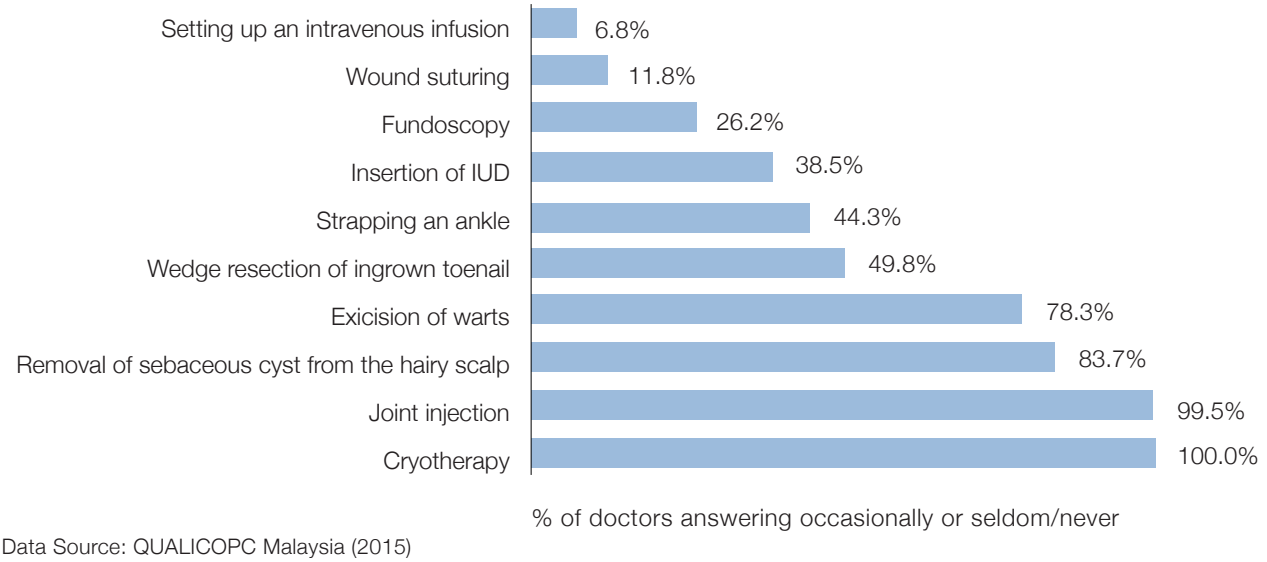
Figure 33. Continuity of Care between Primary Health Care and Specialists, 2015



Data Source: QUALICOPC Malaysia (2015)
Note: N=221 public clinic doctors

Ministry of Health clinics are not as comprehensive as they could be. However, some aspects of the comprehensiveness of services relate to differences in the epidemiology of the population as the survey was designed primarily for European countries which underwent epidemiological transitions earlier than Malaysia (although it is also used in countries such as Turkey with a similar stage of demographic and epidemiological transition to Malaysia).

Figure 34. Procedures by Primary Health Care Doctors at MOH Clinics, 2015

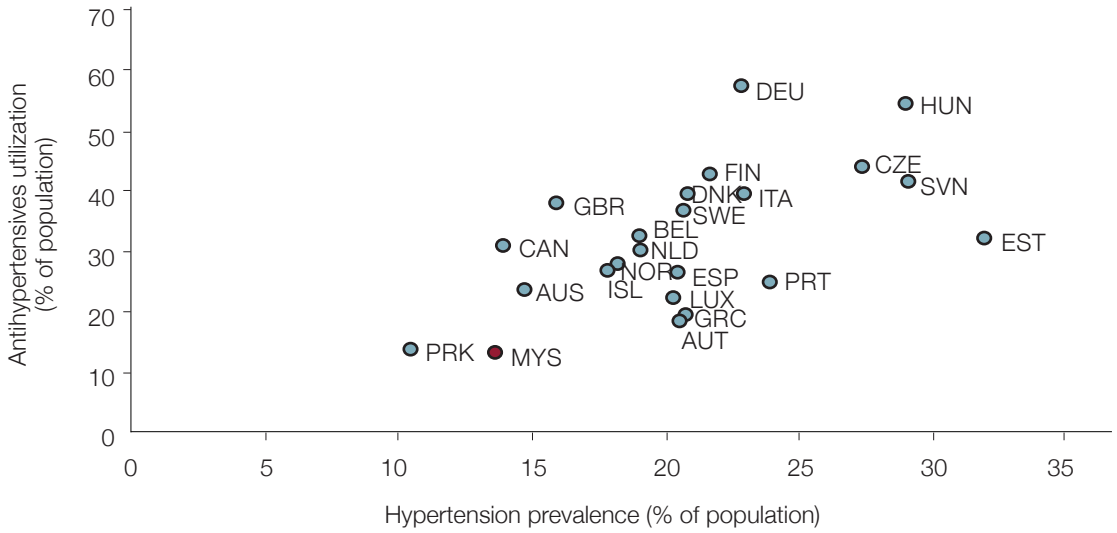


Data Source: QUALICOPC Malaysia (2015)
Question text: "To what extent are the following activities carried out in your practice population by you (or your staff) and not by a medical specialist?"

Another indicator of comprehensiveness of care is the utilization rates of pharmaceuticals (excluding complementary medicine) to treat NCDs and other conditions. Using Defined Daily Doses, the Medicines Analytic Team examined pharmaceutical utilization in both the public (MOH and non-MOH) and private sectors and found that the use of key medicines to treat chronic conditions—such as the use of statins for cardiovascular disease—are low by international comparison even though the prevalence of these conditions exceed the prevalence rates observed in many of the comparator countries. While the use of medicines to treat NCDs has been increasing over the past decade (use of antihypertensive medications increased 78 percent from 2006–2014; use of drugs to treat diabetes doubled; and use of lipid lowering medicines tripled), the rates for antihypertensive medications and lipid lowering medicines (which are highly cost effective) were still far lower (30–40 percent) than the rates seen in OECD countries in 2013.

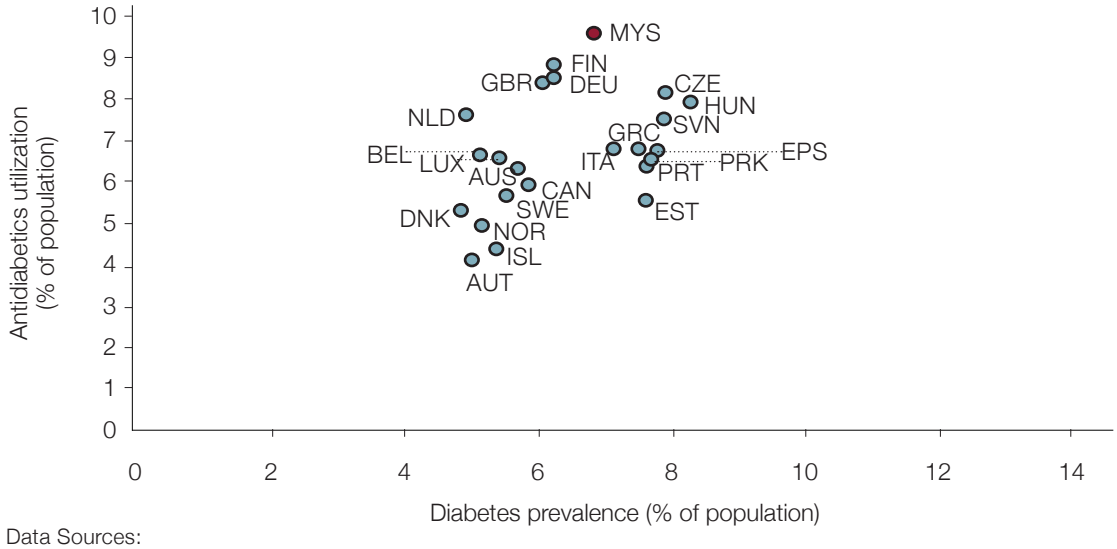
Figures 35 and 36 compare prevalence of and medicines utilization for diabetes and hypertension in Malaysia with OECD countries. The prevalence estimates use internationally comparable data from the World Health Organization and are different than the NHMS estimates cited previously due to different definitions used and because prevalence is measured as a share of the entire population, rather than the adult population. Figure 35 shows that while rates of hypertension prevalence and utilization of antihypertensive drugs are similar in Malaysia (13.6 percent and 13.3 percent of the population, respectively), in most OECD countries antihypertensive utilization exceeds prevalence, likely due to patients using more than one antihypertensive to treat their condition; this may indicate under-prescribing of antihypertensive medications in Malaysia. With regard to diabetes, Figure 36 shows that antidiabetic utilization is high in Malaysia relative to OECD countries with similar levels of prevalence,

Figure 35. Prevalence of Hypertension and Antihypertensive Medicines Utilization in Malaysia and OECD Countries, 2013–2015



Data Sources:
United Nations World Population Prospects: 2015 revision; WHO Global Observatory Data Repository; NHMS 2015; OECD Health Data
Note: Antihypertensive utilization is based on OECD statistics on medicines consumption (2013)

Figure 36. Prevalence of Diabetes and Antidiabetic Medicines Utilization in Malaysia and OECD Countries, 2013–2015



Data Sources:
United Nations World Population Prospects: 2015 revision; WHO Global Observatory Data Repository; NHMS 2015; OECD Health Data
Note: Antidiabetic utilization is based on OECD statistics on medicines consumption (2013)

although this may be due in part to the specific formulations used in Malaysia, which differ from those assumed when making internationally comparable estimates of DDDs. As discussed above, while the overall rate of prescribing for antidiabetic medications in Malaysia does not appear to be a problem, the composition of prescribing may be a concern, and warrants further analysis [34].

Secondary and Tertiary Care Quality

Comprehensive and systematic data are not available on the quality of care at hospitals, either public or private, in Malaysia. However, based on the limited available data, analysis of quality of care indicators was conducted primarily for MOH hospitals.

At the hospital level, typical indicators for quality of care are mortality rates for common causes for admission. The Admissions Analytic Team used hospital discharge databases in public and private hospitals to produce estimates of mortality rates for common acute conditions as defined by a set of OECD indicators used for comparative analysis of OECD countries. The analysis reveals that in Malaysia, 30-day mortality rates for acute myocardial infarction (AMI), and hemorrhagic and ischemic stroke admissions (calculated according to actual deaths both in and outside hospital) were high in 2008 in comparison to most OECD countries (but comparable to Korea), but have been declining in past decade with convergence toward the rates observed in OECD countries. The analysis identified similar trends for stroke. These findings suggest that hospital case management has been improving and approaches OECD countries for these conditions [35].

Another relevant indicator is the proportion of cataract surgeries performed as day cases. Due to

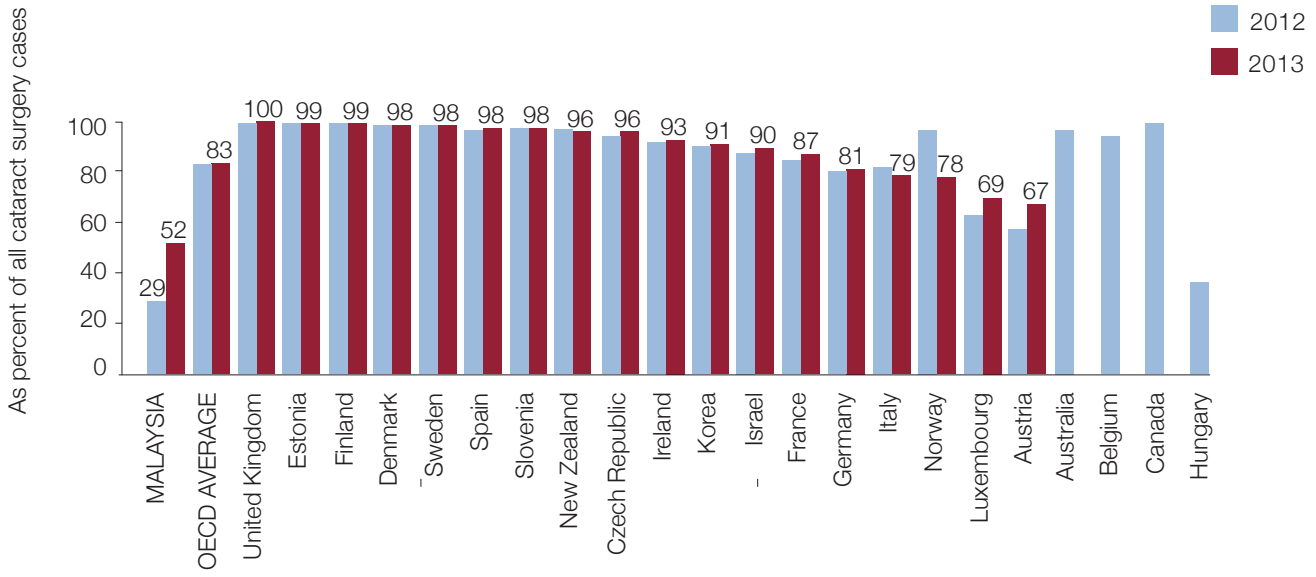
advances in technology, nearly all cases of cataract surgery can now be performed as day cases. Between 2012 and 2013, the proportion of cataract surgeries performed as day case procedures increased from 29 percent to 52 percent at MOH hospitals (Figure 37). While this large and appropriate increase brings MOH hospitals closer to the OECD average of 83 percent in 2013, there is much scope for further efficiency gains and improvements. In many advanced countries, nearly all cataract surgeries are performed as day case procedures. For example, in the United Kingdom, Estonia, Finland, Denmark, Sweden, Spain, Slovenia, New Zealand, and the Czech Republic, the share of day case procedures is greater than 95 percent.

3.2.2. Responsiveness

In addition to the clinical quality of care, an important aspect of quality is responsiveness to user needs, which includes aspects of service quality and patient experience. Under MHSR there are two primary sources of evidence on the responsiveness of care: the analysis conducted by the Satisfaction Analytic Team, based on NHMS-Community Perceptions data, and the data on patient experience included in the QUALICOPC survey.

The findings from the NHMS-Community Perceptions survey are described in greater detail in section 2.4 above. The analysis reveals reasonable levels of satisfaction with both the public and private health-

Figure 37. Day Case Cataract Surgery (2012-2013), Malaysia and Selected OECD Countries



Data source: Medical Development Division, OECD.Stat (includes both day case and outpatient cataract surgery)
Data for Malaysia includes MOH hospitals only

care services on various dimensions of service quality and patient experience, such as convenience of location and operating hours, comfort, availability of services, ability of the doctor to give diagnosis and treatment, clarity of the doctor's explanation, courtesy and helpfulness of providers, and outcomes of care. Sources of greater dissatisfaction with public services include choice of doctor, waiting time, privacy in hospitals, and to a lesser extent the amount of time spent with the doctor, while the main source of dissatisfaction with private services is treatment charges (Section 2.4) [27]. Overall, these findings suggest that care in both sectors is quite responsive to user needs, although improvements in choice and waiting times in the public sector would be valued by service users. Patient choice is a particularly important aspect of responsiveness. As incomes and patient expectations rise, the ability to choose a doctor, and have a regular source of care, will be increasingly valued by patients.

As part of the QUALICOPC study, 10 patients were surveyed for each participating primary care doctor, producing a total of sample of 1,961 service users. Again, the survey covered only MOH health clinics, and 54 percent of the clinics sampled were in rural areas, leading to a dataset that is skewed toward rural patients. The survey on patient experience included 43 questions covering different aspects of care. The analysis reveals that user perceptions of quality and responsiveness are quite high. Patients overwhelmingly reported that providers were polite, attentive, respectful, thorough, explained things clearly, and involved the patient in decisions [28].

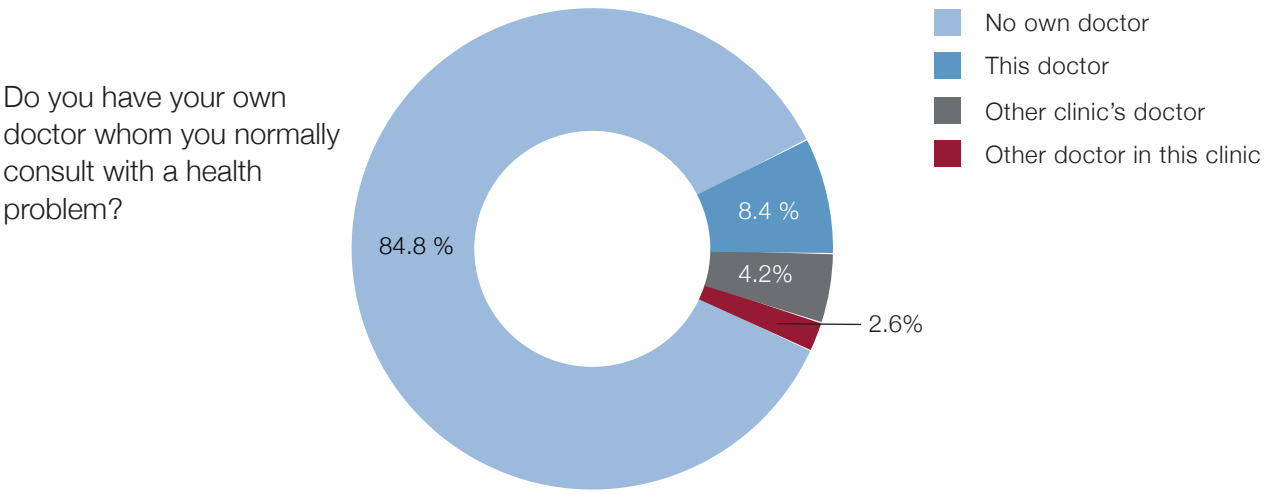
However, patients did report issues with accessibility of care, particularly related to opening hours and waiting times. For example, 51 percent of patients surveyed reported that it was too difficult to see a doctor during evenings, nights, or weekends. Thirty seven percent of patients reported waiting more than an hour between arriving at the clinic and receiving a consultation, and only 19 percent of patients had a scheduled appointment [28]. It is important to note that these results are from a sample of patients attending the clinics surveyed; patients most affected by accessibility issues, such as waiting times and clinic opening hours, are less likely to visit the clinic. Therefore, these results may underestimate the extent of problems related to accessibility.

Furthermore, 85 percent of patients surveyed indicated that they did not have a regular doctor whom they normally consult for a health problem (Figure 38) [28]. This finding relates to both choice of provider as well as continuity of care, an important element of quality which can also affect health outcomes.

While the patients surveyed in the QUALICOPC study reported that they were likely to visit a clinic for most acute and preventative care, they were less likely to visit a clinic for health care needs such as help to quit smoking, anxiety, domestic violence, sexual problems, or relationship problems, which reflects not only the nature of health services but also the culture of health care and health seeking behavior among patients. High proportions of patients (53.8 percent) also report that the clinic doctor was not aware of their living situation, and would not be able to help with a personal problem [28].

Overall, the analysis of available data indicate that patients are generally satisfied with the quality and responsiveness of care that they receive in the Ma-

Figure 38. Continuity of Care in Primary Health Care, 2015



Data Source: QUALICOPC Malaysia (2015); Note: Patients at public clinics; N = 1927

laysian health system, although waiting times and hours are a concern in the public sector, continuity of care is limited, and patients are not accessing the full range of care that they could benefit from in public clinics.

3.3. Efficiency

There are several dimensions of efficiency that are important for health system performance. The first is macro-level efficiency—whether the health system produces the desired outcomes in terms of population health, financial risk protection, and public satisfaction while spending an acceptable proportion of GDP on health. Malaysia currently spends about 4.0 percent of its GDP on health (according to data using the SHA framework [25]), which is relatively low compared to high-income countries and also compared to countries at a similar income level, including Brazil (9.7 percent of GDP), Chile (7.4 percent), Estonia (6.0 percent), Mexico (6.2 percent), and Turkey (5.1 percent) [30, 37].

A useful way to assess macro-level efficiency of the health system is to compare health outcomes across countries relative to income and health spending. We examine outcomes in terms of Health Adjusted Life Expectancy, which takes into account both mortality and morbidity. By adjusting for the predicted effects of income and health spending on health outcomes, the analysis reveals whether health outcomes achieved are better than average, average, or worse than average relative to a country's income level and health spending. Analysis using the most recent available data (2013) from the Institute for Health Metrics and Evaluation [19] and World Bank World Development Indicators [11], shows how Malaysia performs relative to comparator countries (Figure 39). While Malaysia's health outcomes are slightly better than average (as indicated by Malaysia's location in the upper right quadrant of Figure 39), several

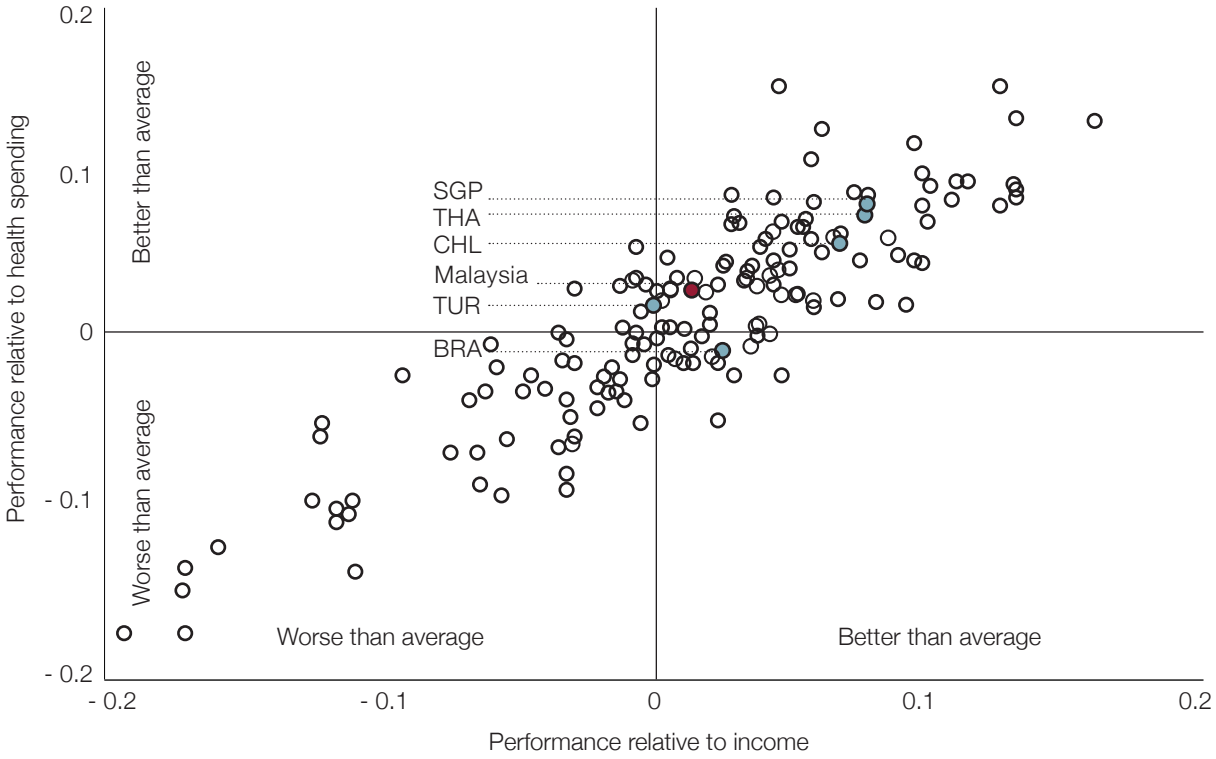
regional and middle-income comparators (Thailand, Chile, and Singapore) perform substantially better relative to income and health spending.

Related to macro-level efficiency, the concept of allocative efficiency refers to whether resources in the economy are allocated to the uses that result in the greatest social and economic benefit (benefit-cost ratio). While economic analysis can be used to estimate the benefit-cost ratio of various uses of public funds, ultimately this is a policy question tied to the degree to which a country prioritizes health gains relative to other social and economic goals.

At the micro-level, within the health system, allocative efficiency refers to whether resources are allocated in a way that produces the best possible health outcomes. For example, is the appropriate share of resources directed to primary as opposed to secondary healthcare activities, or could overall outcomes be improved by shifting resources between these sectors?

On the other hand, technical efficiency refers to whether outputs are produced at the lowest possible cost using the optimal mix of inputs. For example, are hospital bed-days and outpatient visits produced efficiently, or could the same services be delivered at lower cost without affecting outcomes?

Figure 39. Health Adjusted Life Expectancy Relative to Income and Health Spending, 2013



Source: WDI and IHME
Note: SGP (Singapore), THA (Thailand), CHL (Chile), BRA (Brazil), TUR (Turkey)

3.3.1. Allocative Efficiency

Within a health system, allocative efficiency is achieved when resources are directed to the mix of uses that yield the greatest possible outcomes in terms of health, financial risk protection, and user satisfaction. While it would be very difficult to comprehensively assess allocative efficiency in a health system, we look at several aspects of resource allocation within the Malaysian health system to identify potential opportunities for efficiency gains.

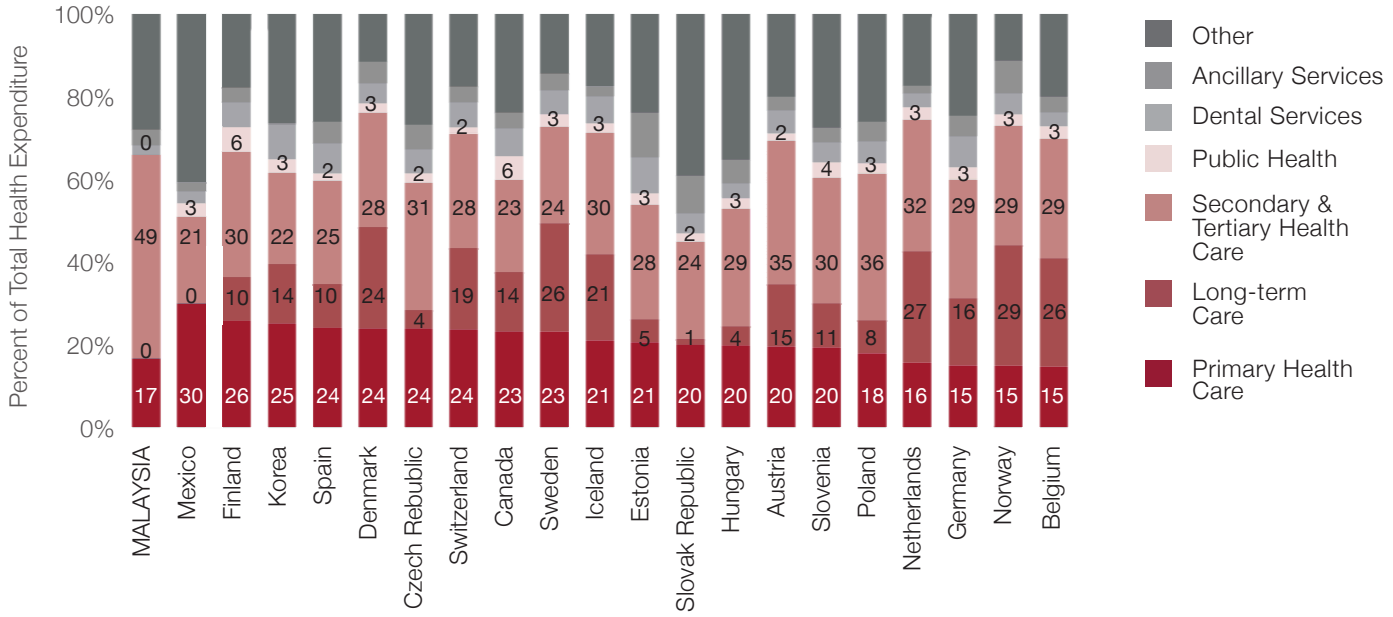
One area of analysis is the allocation of resources to primary care as opposed to secondary and tertiary care. International evidence suggests that greater emphasis on primary care is associated with lower aggregate health spending, in addition to better health outcomes [38]. By international comparison, Malaysia spends a high proportion of its health resources on secondary and tertiary health care (49 percent of total health expenditure), but a low proportion on primary care (17 percent), and very little on long-term care, according to national health accounts data using the SHA framework for international comparability.[5] In contrast, Mexico spends 30 percent of total health expenditure on primary care and 21 percent on secondary and tertiary care, and Estonia spends 21 percent on primary care and 28 percent on secondary and tertiary care (Figure 40). When comparing with selected OECD countries, while the share of primary care expenditure as a proportion of total health expenditure in Malaysia appears comparable to countries such as Norway and Belgium, in these two countries the relatively low share of spending on primary care is due mainly to the provision of primary care services through long-term care, which accounts for about 29 percent of total health expenditure.

The allocation of government health expenditure (as opposed to total health expenditure) is even more skewed toward secondary and tertiary care, with 65 percent of government health spending allocated to secondary and tertiary care, compared to only 11 percent spent on primary health care [23].

Furthermore, an examination of the allocation of resources over time indicates shifting of expenditure further toward secondary and tertiary care. For example, between 1997 and 2013, real expenditure per capita on secondary and tertiary care increased by 130 percent, while expenditure per capita on primary care increased by only 73 percent (Figure 41) [23]. While indexed expenditure rose in parallel from 1997–2007, expenditure patterns began to diverge in 2008. This represents a health system-level failure to prioritize PHC. The trend showing clear divergence in PHC and STHC expenditures is driven by the recent investment in building hospitals in the private sector, although government health expenditures have also become even more skewed toward STHC. For example, in 2008, 13 percent of government expenditure was on PHC; by 2013, this figure had declined to 10 percent. Similarly, in the private sector, while in 2008 25 percent of expenditure was on PHC, by 2013, this figure had declined to 19 percent. This skewed distribution of resources toward curative treatment of complications at the hospital level is not allocatively efficient compared

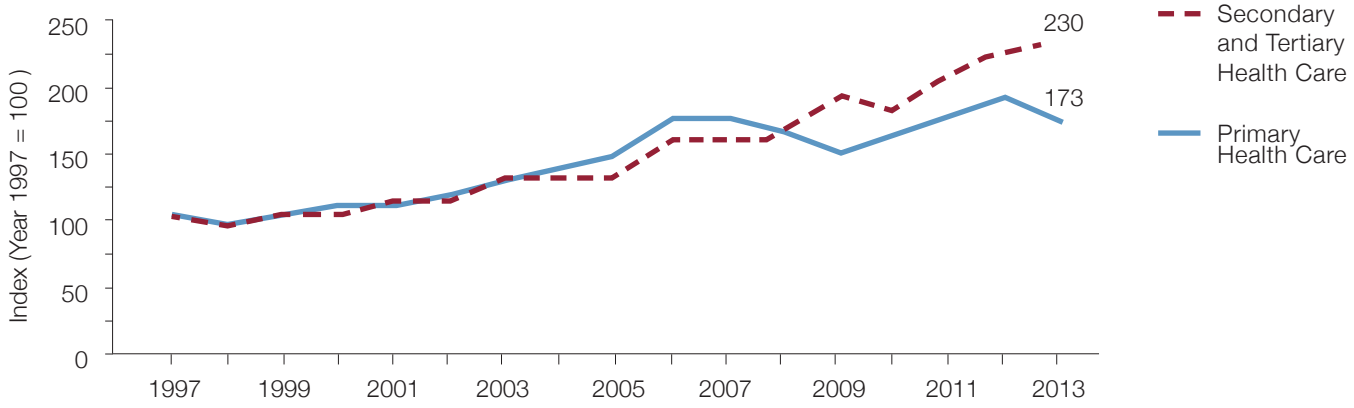
[5] This analysis represents a best estimate generated by collapsing OECD SHA categories which separate inpatient and outpatient services, as the System of Health Accounts framework is not designed to distinguish between levels of care. It should be noted that there are variations in the exact methodology for classifying health expenditures across countries, and thus the breakdown by level of care is not strictly comparable; therefore, this analysis should be interpreted as indicative of broad variations only. The 'Other' category can include medical goods (such as pharmaceuticals and medical non-durables).

Figure 40. Total Health Expenditure, by Function, Malaysia and Selected OECD countries, 2013



Data Source: Malaysian National Health Accounts Systems of Health Accounts Framework (2013), OECD (2013)

Figure 41. Indexed Expenditure on Primary Health Care and Secondary and Tertiary Health Care (Public and Private, Real per Person), 1997–2013



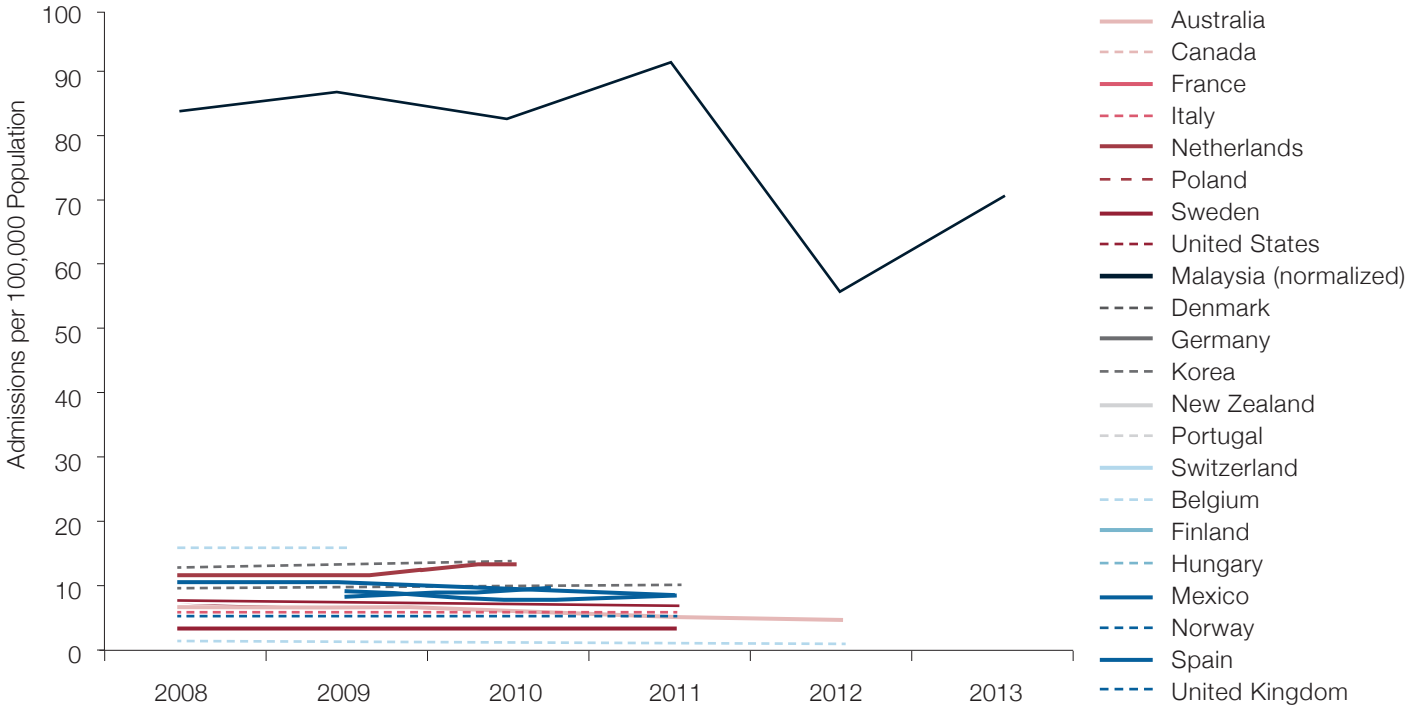
Data Source: Malaysian National Health Accounts; International Monetary Fund World Economic Outlook

with investments in preventive and promotive care at the PHC level, which are critical for effective management of NCDs.

One of the consequences of this skewed allocation of resources toward hospital care is the high share of hospital admissions that are for ambulatory care-sensitive conditions, or conditions that could have been managed, with fewer resources and better health outcomes, in ambulatory care settings (including both primary care clinics and hospital outpatient settings). The Secondary and Tertiary Care Analytic Team found that between 14.6 and 16.7 percent of admissions to public hospitals, and between 16.8 and 19.5 percent of admissions in private hospitals, are for conditions that could be managed in ambulatory care settings. About one half of the ambulatory-care sensitive admissions in Ministry of Health hospitals are due to bronchopneumonia, infectious gastroenteritis and colitis, and asthma—conditions that should be effectively managed through primary care at health clinics [23].

Further indicative evidence of the adverse consequences of allocatively inefficient application of resources is the very high rate of admissions to hospital for long-term complications of diabetes mellitus, which was used as a tracer condition to examine management of common NCDs in Malaysia. Analysis by the Admissions Analytic Team showed that the admission rate for long-term complications of diabetes mellitus was three times higher than the OECD comparator with the highest admission level (Figure 42) [35]. This finding suggests that hospitals

Figure 42. Hospital Admissions for Long-Term Complications of Diabetes, Malaysia and OECD Countries, 2008–2013



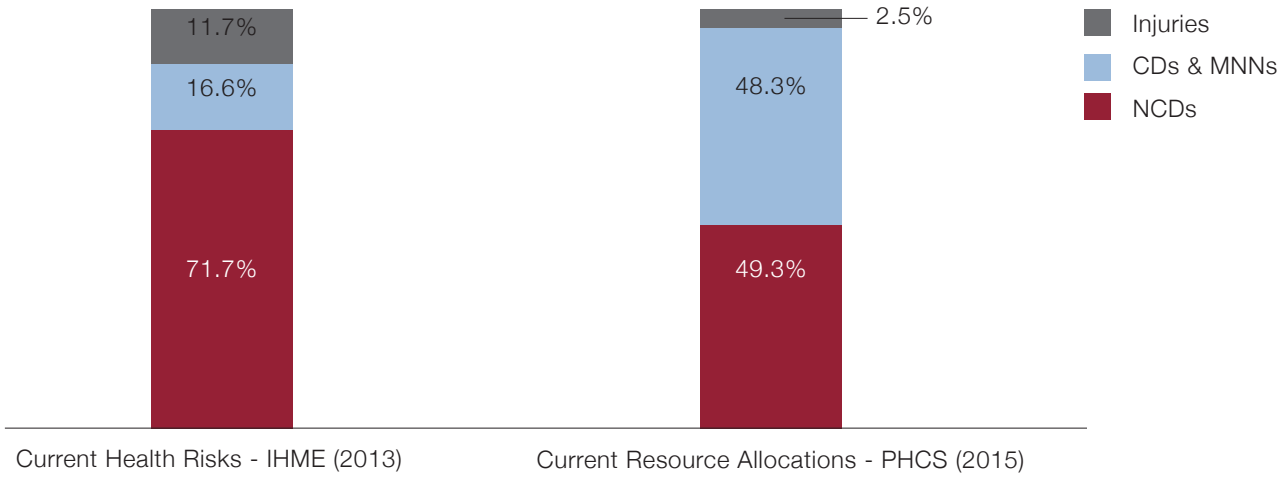
Data Source: Health Informatics Centre, Department of Statistics Malaysia and OECD

are being used as long-term care facilities, delivering services that could be produced at lower cost and with similar or better outcomes elsewhere—a finding corroborated by anecdotal evidence emerging from discussions with Ministry of Health officials.

The MHSR Public Health Analytic Team examined resource allocation within the public health function of the MOH. In the absence of regularly collected data, the team used a small-scale time-allocation study (the Public Health Costing Survey) to estimate the proportion of public health resources (measured by person hours of district health office staff adjusted for salary grade) allocated to different health risks, and compared this to the burden of disease attributable to different health risks. The analysis revealed that while NCDs account for 72 percent of the disease burden in Malaysia, less than 50 percent of public health resources at district level are dedicated to controlling risk factors for NCDs [23]. In terms of resources devoted to particular risks, controlling dengue is the single largest resource commitment (15 percent) at the district level, with key NCD risk factors such as dietary risks, high blood pressure, tobacco, high body mass index, and high fasting glucose receiving modest allocations of about 2–3 percent each, despite being the largest contributors to lost DALYs in Malaysia (Figure 43).

Whether or not the apparent mismatch of burden of disease and allocation of public health resources reflects an inefficient allocation of resources depends on the nature of appropriate public health interventions to address specific risks (for example, smoking might best be controlled through national policies such as tobacco taxation, which would result in a net revenue gain rather than expenditure) and also on the cost-effectiveness of these interventions. The most efficient resource allocation is not necessarily one where the share of resources closely reflects

Figure 43. Public Health Resource Allocation and Overall Burden of Disease, 2013/2015



Data Source: Institute for Health Metrics and Evaluation (2013) and Public Health Costing Study (2015)
Note: MNN = Maternal, neonatal, and nutritional conditions; CDs = Communicable Diseases; NCDs = Non-communicable diseases

the disease burden. Nonetheless, considering the rapidly rising prevalence of NCDs, this analysis provides supportive evidence of under investment and/or misalignment of public health resources in controlling NCDs.

Overall, our analysis suggests that there are potential opportunities for improving allocative efficiency in the health system—thereby improving outcomes without increasing costs—for example by investing more resources in primary care relative to secondary and tertiary care, and by better aligning public health resources with current and emerging health risks.

3.3.2. Technical Efficiency

Technical efficiency means that outputs are produced at the lowest possible cost, with an optimal mix of inputs used to produce a given set of outputs. Under MHSR, the key analysis that will inform technical efficiency is the Health Facility Costing Study, which is collecting data from 41 hospitals, 41 health clinics, and 40 dental clinics across Malaysia, and will produce unit cost estimates for inpatient and outpatient services in the public sector as well as estimates of the variation in costs across facilities [37]. The findings of the Health Facility Costing Study will shed light on the relative costs between the public and private sectors, as well as whether some public facilities are able to produce health service outputs at lower cost than others, which would indicate potential technical inefficiencies. This study is still underway, with results expected in early 2016.

In the interim, suggestive evidence is provided by the 'Cost Function Analysis' carried out by the Costing Analytic Team, which used four years of data on inputs and outputs for public hospitals and district health offices to produce estimates for marginal costs and average incremental costs for hospital inpatient admissions, emergency department visits, outpatient visits, and maternal and child health visits.

The Costing Analytic Team assessed the relative performance of MOH hospitals using Stochastic Frontier Methods. A comparison of public and private hospitals would have been desirable, but the relevant data were unavailable. The analysis of MOH hospitals suggest that there is considerable variation in distance from the so-called 'stochastic efficiency frontier' (the estimated limit for technical efficiency in a particular country) across different classes of hospitals—district hospitals, specialty hospitals, and state hospitals. Some of these differences can be explained by the additional functions performed by some hospitals, such as training. The analysis provides some preliminary evidence that district hospitals with higher lengths of stay also produce poor results on the efficiency measure [37]. This finding is in line with findings in MHSR indicating that district hospitals are also acting as providers of long-term care. Smaller district hospitals also score lower on the efficiency measure. Other than these findings, at this stage of the analysis no clear conclusions can be drawn about the sources of differences in efficiency scores.

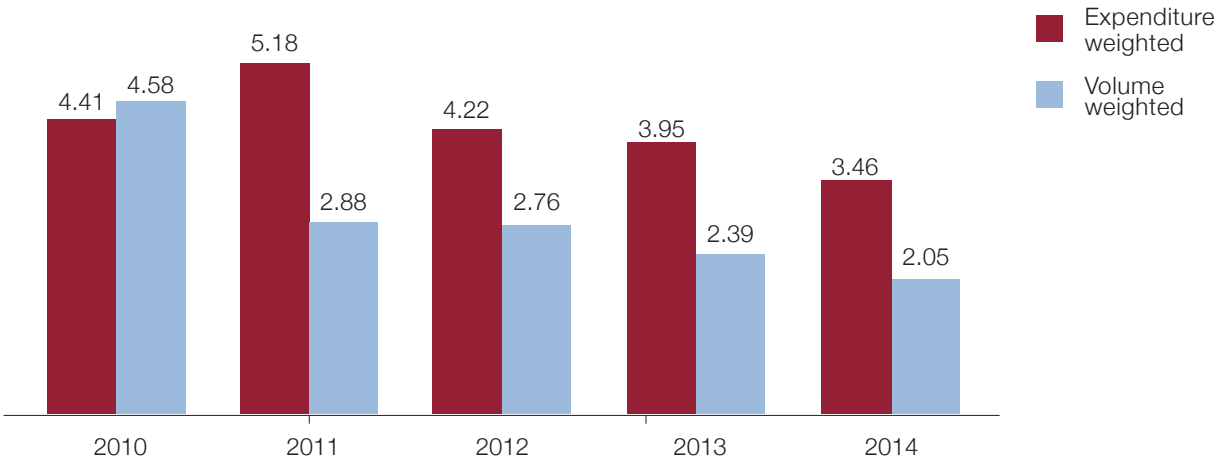
The Medicines Analytic Team pricing analysis provides evidence on one particular aspect of technical efficiency—whether drugs are purchased at the lowest possible cost. Public sector procurement prices were compared with international reference prices (IRPs) using the World Health Organization (WHO) and Management Sciences for Health

methodology for benchmarking pharmaceutical procurement prices based on a basket of drugs [39]. The international reference price is calculated as the median price obtained for a pharmaceutical product by procurement agencies in a range of low- to upper-middle income countries, as well as other multi-country agencies that provide data to the WHO-Management Sciences for Health database. The IRP is generally considered a benchmark of the prices that well-functioning, efficient public procurement systems can obtain, and prices are based on purchasing medicines that meet WHO quality standards.

In Malaysia, public sector procurement prices were on average three to four times the corresponding IRP for the period 2010–2014 when purchases were weighted by total expenditure, and around twice as high as the corresponding IRP when weighted by volume. Procurement prices decreased from 2010 to 2014 for a basket of medicines that had a match to an IRP in all five study years, irrespective of the weighting method used. For example, the volume-weighted average price ratio relative to the IRP decreased from 4.58 in 2010 to 2.05 in 2014 (Figure 44) [39].

From 2010 to 2014, between 22 percent (2012) and 30 percent (2011) of all medicine products were procured at prices below the IRP. During the same period, between 45 percent (2013) and 50 percent (2012) of medicine products were procured at more than two times the IRP. However, in the most recent year (2014), medicines purchased at or below two times the IRP accounted for nearly 80 percent of medicines by volume, and this share has gradually increased from 2010 for the basket of medicines with an IRP match from 2010 to 2014. These medicines, however, accounted for only 55 percent of total expenditures, indicating that higher procurement prices for high-cost but low volume products have a substantial impact on the budget for medicines. This is a potential area for improvement in medicines procurement in the public sector [39].

Figure 44. Weighted Average Median Price Ratio (MPR) for Basket of Medicines (N=317), 2010-2014



Data source: IMS Health Malaysia (2010-2014) and analytic team's calculation

4. Emerging Opportunities and Challenges

4.1. Demographic and Epidemiological Transitions

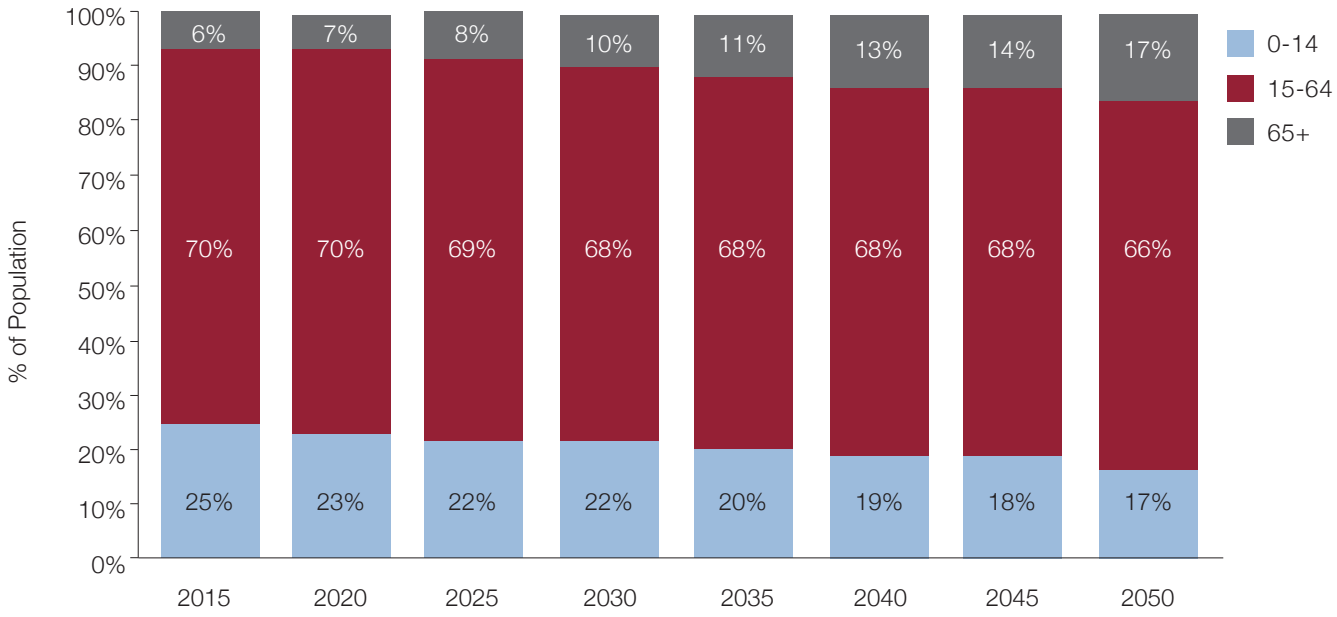
4.1.1. Ageing

Based on the UN Population Projections, Malaysia will become an 'ageing' society by 2020, with seven percent of the population aged 65 years or older, and will progress rapidly in this demographic transition, from an 'ageing' to an 'aged' society (14 percent greater than age >65 years) in a short period of just 20 years [40]. By comparison, this same demographic transition took 115 years in France, 45 years in the United Kingdom, and 69 years in the United States [40].

The working-age population (aged 15–64 years), from which Malaysia has the potential to reap a demographic dividend, made up 70 percent of the population in 2015, but this proportion is expected to decrease to 64 percent by 2050 and 56 percent by 2100. The elderly (aged ≥65 years), which currently account for six percent of the population, will double in percentage terms by 2040, and double again by 2080 (see Figure 45). This rapid demographic transition will have major implications for changing epidemiological patterns in Malaysia—impacting the health workforce, and broader economic development [23].

As the population ages, the demographic transition

Figure 45. Population Projections, by Age Group, 2015–2050



Data Source: UN World Population Prospects (2015) (Medium Variant)

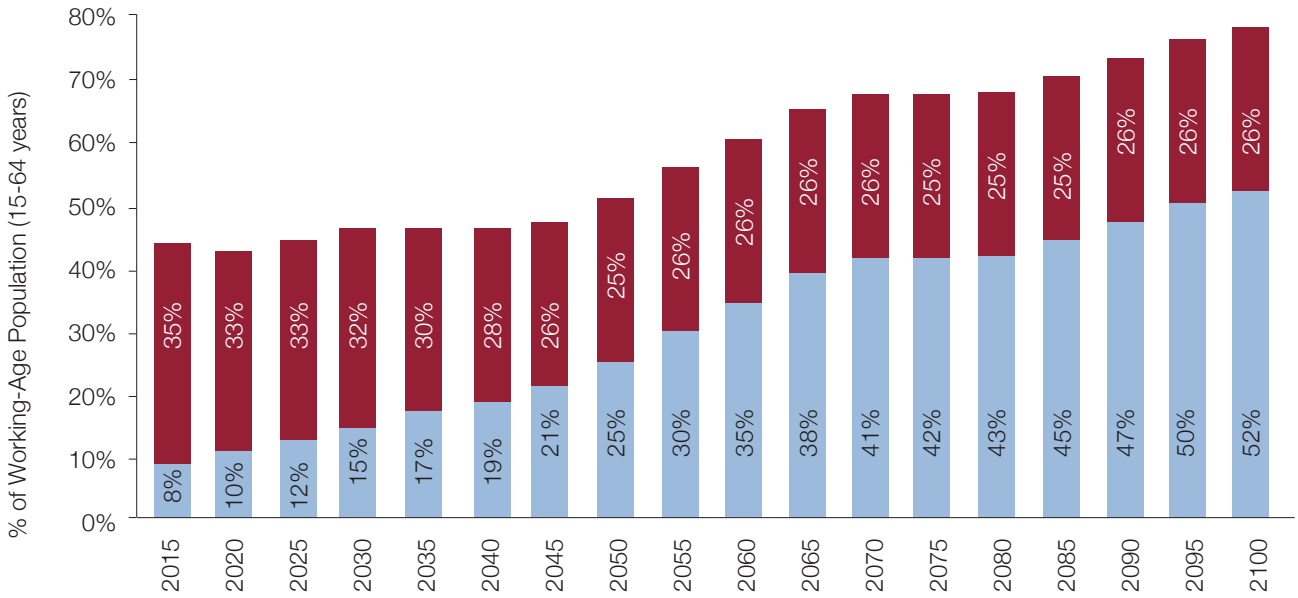
is followed by an epidemiological transition, with rising prevalence of NCDs—for which age is a risk factor—such as cancers, metabolic diseases (including diabetes mellitus), cardiovascular disease, chronic respiratory diseases, and disability. The epidemiological transition is already well underway in Malaysia, as indicated by the high and growing prevalence of hypertension, diabetes mellitus, and hypercholesterolemia.

Furthermore, in addition to changes in disease patterns, the rapid pace of ageing poses challenges to the supply and financing of healthcare services, driven primarily by the relative decline in the size of the working-age population. Age dependency ratios (the ratio of dependents, both young and old, to the working-age population) will worsen—from 43 percent today to 50 percent in 2050 and to 78 percent in 2100. The change from 2015–2050 is relatively modest because the increasing old age dependency ratio (which rises from 8 to 25 percent) is offset by a decline in the young age dependency ratio (35 percent to 25 percent) [41]. However, from 2050 onwards, the overall age dependency ratio worsens more dramatically as the young age dependency ratio stabilizes (Figure 46) [23].

4.1.2. Non-Communicable Diseases

Rapid ageing of the Malaysian population, accompanied by changing lifestyles, nutritional transition (to high calorie, low nutrition food), and declining physical activity, has contributed to the rise in the prevalence of NCDs. In 1990, NCDs accounted for 60 percent of the burden of disease in Malaysia, as measured by Disability Adjusted Life Years (DALYs) lost. But in 2013 NCDs had increased in relative terms to account for 72 percent of the non-age standardized total disease burden, reflecting

Figure 46. Age Dependency Ratios for Malaysia, 2015–2100



Data Source: UN World Population Prospects (2015) (Medium Variant)

an absolute increase in NCD disease burden of 82 percent (from 2,522 DALYs per 1,000 population [all ages] in 1990 to 4,579 in 2013) (Figure 47) [19].

Non-Communicable Disease Risk Factors

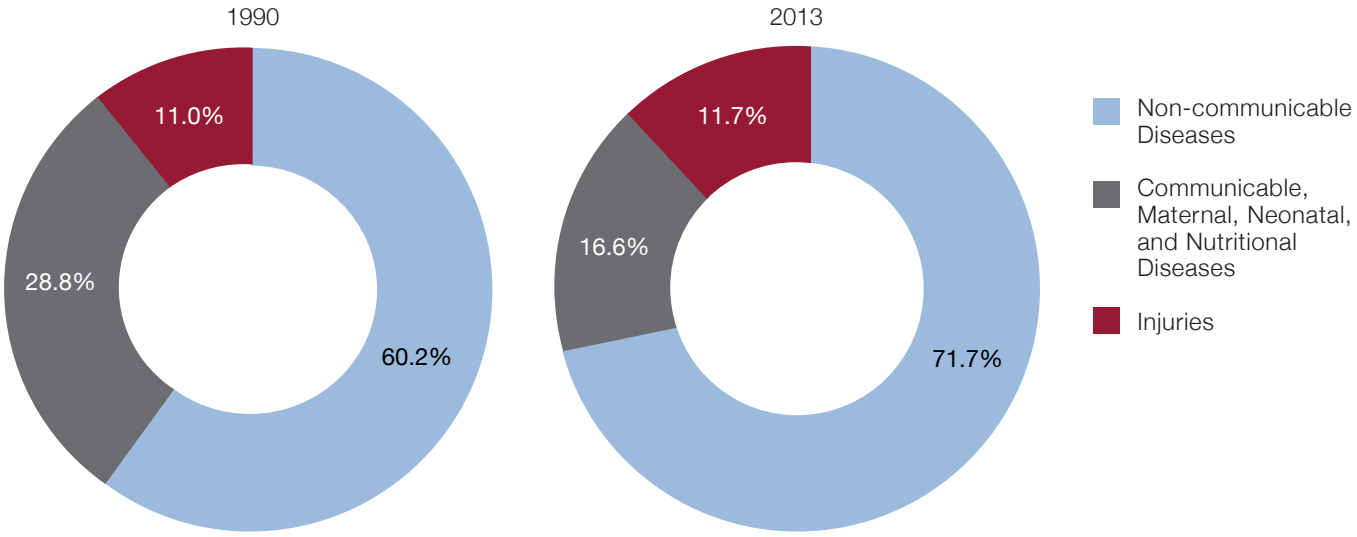
In addition to rising NCDs, the rapid economic and socio-cultural transitions in Malaysia, accompanied by ageing and changing lifestyles, have also brought high and in many cases increasing prevalence of health risks related to NCDs—such as dietary risks, physical inactivity, obesity, smoking, and heavy drinking.

Almost all (98.5 percent) adults aged 18 years and over in Malaysia reported at least one of these five risks in the NHMS 2015. The prevalence of overweight (BMI ≥ 25 kg/m^2) has more than doubled in the last 10 years—from 21 percent of the adult population in 2006 to 48 percent in 2015—while the prevalence of obesity has almost tripled from seven percent to 18 percent over the same period (Figure 48). Using BMI ≥ 23 kg/m^2 as the cutoff for overweight, which for Asian populations may be a more appropriate threshold and is recommended by the Malaysian Clinical Practice Guidelines, the prevalence of overweight is much higher at 64 percent in 2015 (rising from 30 percent in 2006) [23, 42].

Waist circumference is also often used as an independent risk factor for cardiovascular disease. Based on this measure, and using thresholds from the Malaysian Clinical Practice Guidelines, 53 percent of adult Malaysians in 2015 had a waist circumference above the recommended threshold, which is associated with increased cardiovascular risk [23].

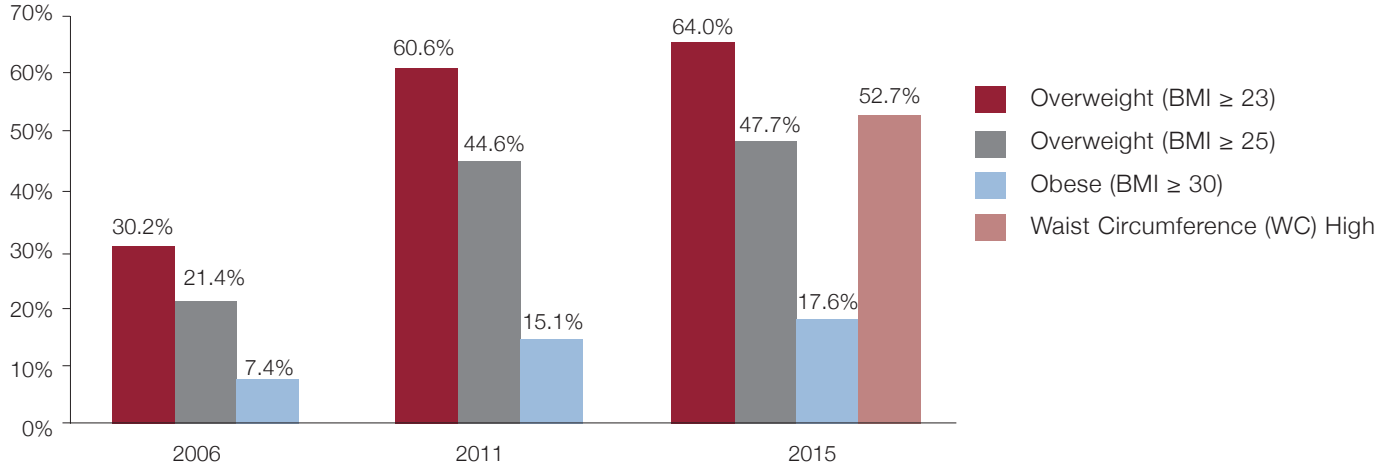
The high prevalence of overweight and obesity reflects low levels of physical activity and unhealthy diets seen in the population. Around 48 percent of Malaysian adults aged ≥18 years are physically

Figure 47. Lost DALYs in Malaysia by Category, 1990 and 2013



Data Source: Institute for Health Metrics and Evaluation (2013)

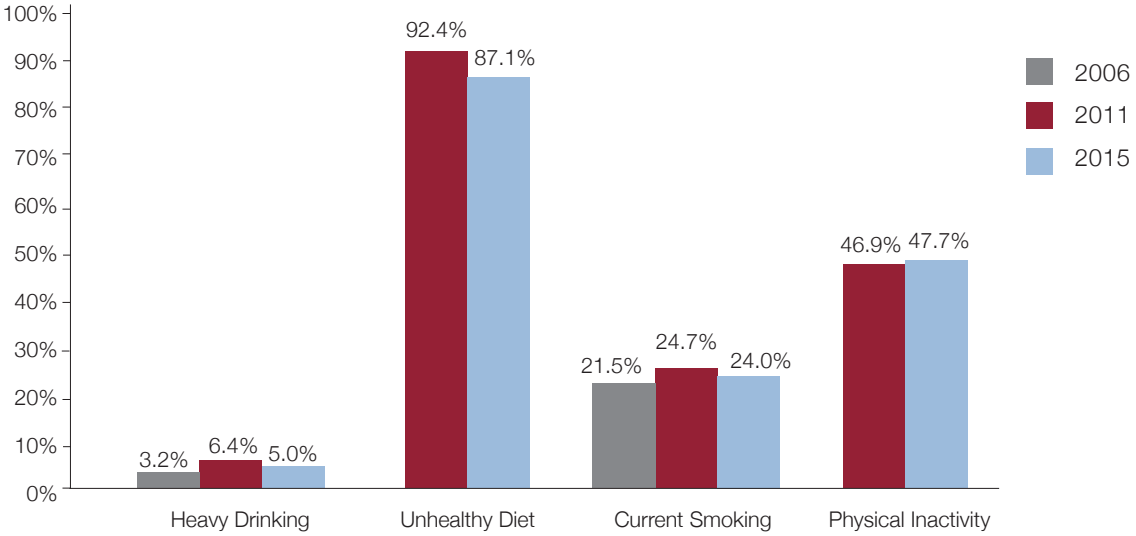
Figure 48. Prevalence of Overweight and Obesity, Adults (≥18 years), 2006–2015



Data source: National Health and Morbidity Survey (Waist Circumference ≥ 90 Male or ≥ 80 Female)

inactive, and almost 90 percent of Malaysians have an unhealthy diet. The prevalence of smoking among adults is 24 percent, which is comparable to OECD countries (Figure 49). Studies based on the latest NHMS data suggest, however, that the level of tobacco smoking is rising in children, especially adolescent males. Heavy drinking, on the other hand, with a prevalence of five percent, is low (Figure 49) [23].

Figure 49. Prevalence of NCD Risk Factors of Heavy Drinking, Unhealthy Diet, Physical Inactivity and Current Smoking, Adults (≥18 years), 2006–2015



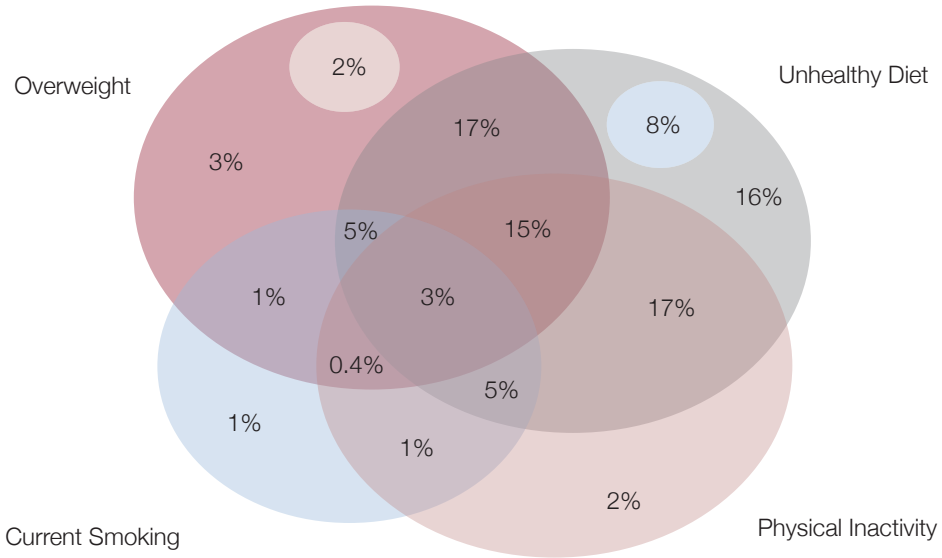
Data Source: National Health and Morbidity Survey; Available years only

Multiple Risk Factors

In addition to the high and increasing trends for some individual NCD risk factors, combinations of risk factors—where a single individual has more than one risk—also have important implications for NCD morbidity, as these risk factors have a multiplier rather than an additive effect in terms of increasing risk of NCDs [43].

Figure 50 presents the overlap between four key NCD risk factors as a Venn diagram—overweight, dietary risks, physical inactivity, and smoking. (Heavy drinking, with a prevalence of five percent, has been excluded in order to permit better visualization.) Almost the entire adult population (98 percent) has at least one of these risk factors, and very few adults (22 percent) have only one isolated risk factor. For example, even though many individuals are physically inactive or overweight, only two percent and three percent respectively have these individual risk factors without any other risk factors. In fact, approximately 18 percent of adults have both of these risk factors together in addition to dietary risk factors [23].

Figure 50. Multiple Risk Factors, Adults (≥18 years), 2015



None of these 4 risks = 2 percent

Data Source: National Health and Morbidity Survey (2015)

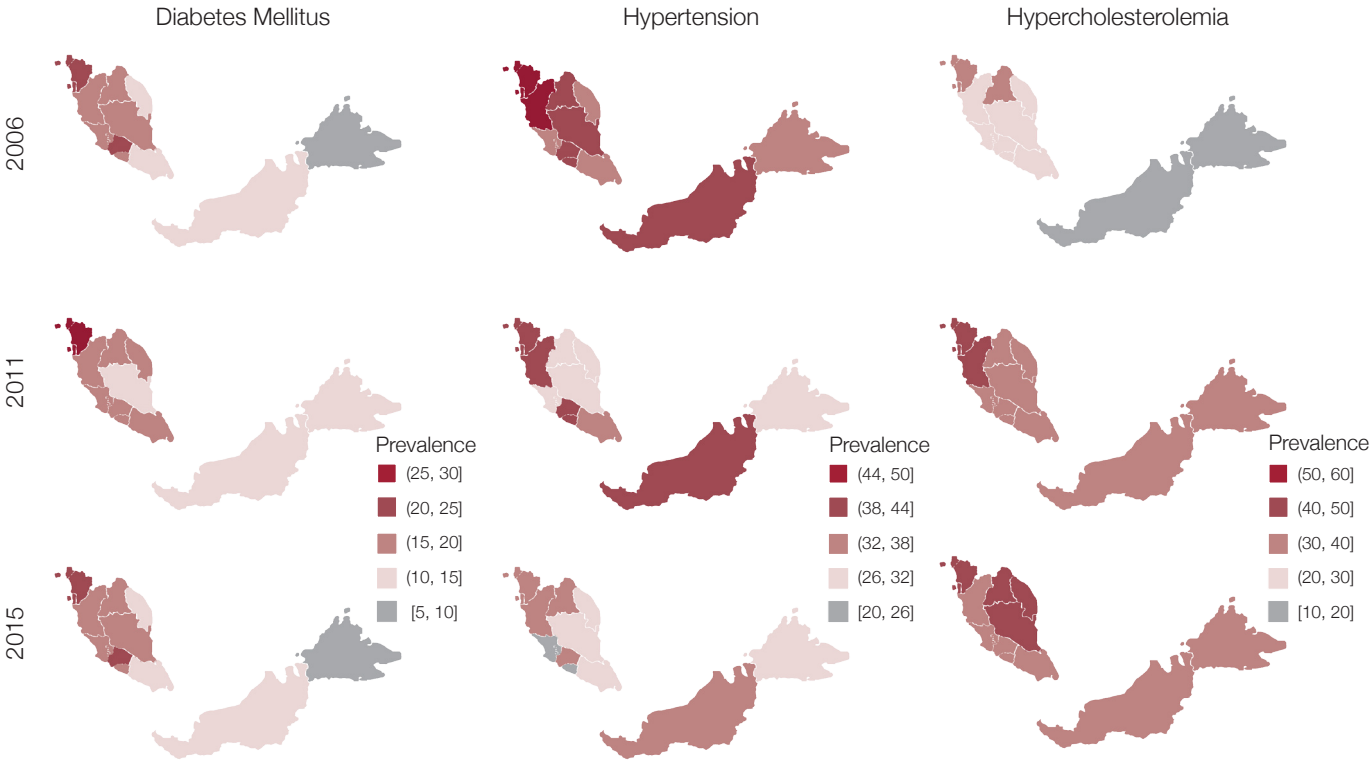
Geographic Distribution of Non-Communicable Diseases

MHSR analyses suggest that NCD morbidity is not distributed evenly throughout the country. Figure 51 shows sequential maps of the prevalence of diabetes mellitus, hypertension, and hypercholesterolemia (diagnosed and undiagnosed) from 2006–2015 by state. Several observations are notable. First, although there is a clear increase in the general prevalence of diabetes mellitus and hypercholesterolemia, certain states are more affected than others—often dramatically so. For example, the prevalence of diabetes mellitus in Kedah is 25.3 percent compared with 14.1 percent in Sabah. The northwest and east coast of Peninsular Malaysia and Sarawak have the highest prevalence of diabetes mellitus in the country [23].

Second, the temporal progress of these conditions is geographically heterogeneous. For example, Negeri Sembilan, which had a relatively high prevalence of diabetes mellitus in 2006, is also the only state which showed a decrease in the prevalence of diabetes mellitus between 2011 and 2015. Kelantan is the only state where the prevalence of hypertension increased between 2011 and 2015, in contrast with decreases in prevalence elsewhere in the country [23].

Third, while both diabetes mellitus and hypercholesterolemia appear to cluster geographically together—with concentrations in the northwest and

Figure 51. Prevalence of Diabetes Mellitus, Hypertension, and Hypercholesterolemia (Diagnosed and Undiagnosed), Adults (≥18 years), 2006–2015



Data source: NHMS

east coast of Peninsular Malaysia—the pattern is less clear for hypertension [23].

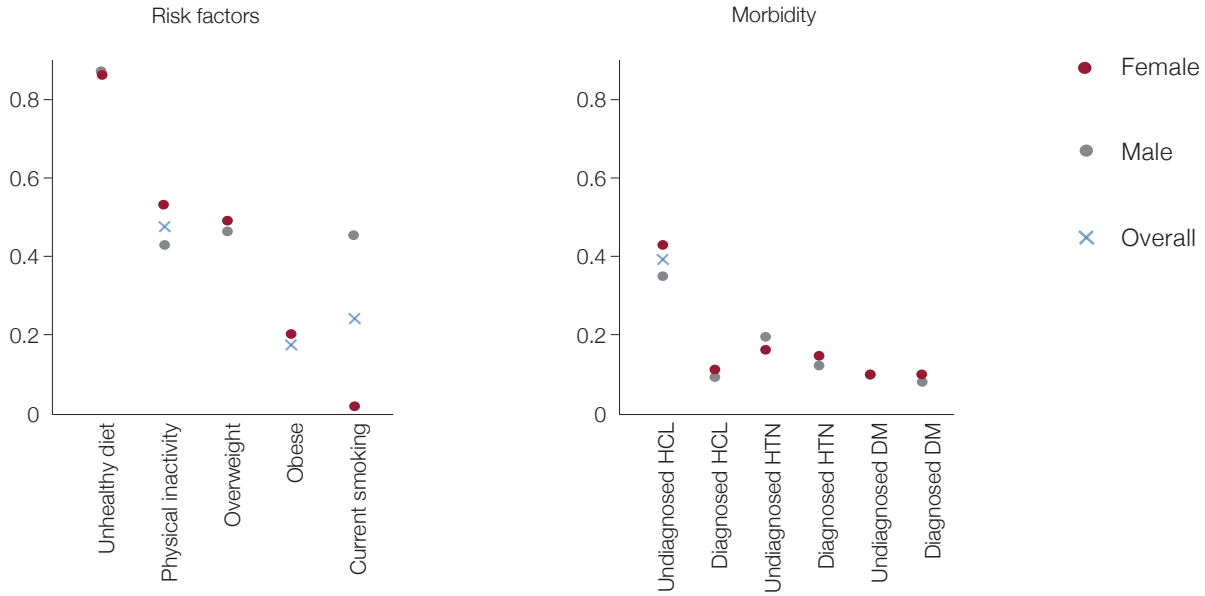
Distribution of Risk Factors and Morbidity by Socioeconomic Status

Using the NHMS data, the Public Health Analytic Team explored the prevalence of risk factors for NCDs by population subgroups: males and females, ethnic groups, income quintiles, urban and rural residents, and education levels. Using NHMS 2015 data, the Analytic Team also examined rates and patterns of diabetes, hypertension, and hypercholesterolemia among different population groups in Malaysia. Prevalence includes both diagnosed and undiagnosed cases, using results from blood glucose, blood pressure, and cholesterol screenings collected with the survey data.

Analysis of the NHMS 2015 data reveals that females have fewer lifestyle (modifiable) risk factors than males. In particular, smoking prevalence, physical inactivity, and heavy drinking are less prevalent in females. However, the prevalence of hypercholesterolemia is higher in females (Figure 52) [23].

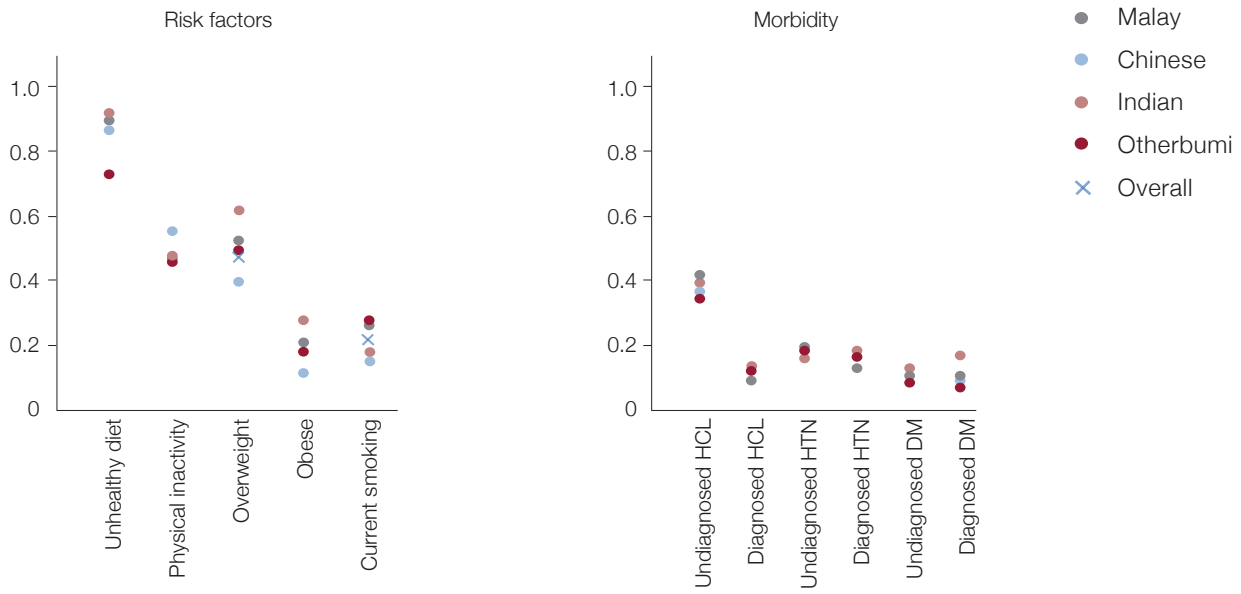
There are also substantial ethnic differences in the distribution of risk factors. Indian Malaysians have a higher prevalence of overweight and obesity, while Chinese Malaysians are least likely to be obese (Figure 53). There are also ethnic differences in smoking behavior—with higher smoking rates among Malays and other Bumiputera, and alcohol consumption—with Chinese Malaysians, other Bumiputera, and Indian Malaysians more likely to be heavy drinkers, although there may be underreporting of drinking given cultural and religious norms (Figure 53). These

Figure 52. Distribution of Risk Factors and Morbidity by Sex, Adults (≥18 years), 2015



Data source: NHMS 2015. Note: Dots are proportions; HTN=Hypertension, DM=Diabetes, HCL=Hypercholesterolemia

Figure 53. Distribution of Risk Factors and Morbidity by Ethnic Group, Adults (≥18 years), 2015

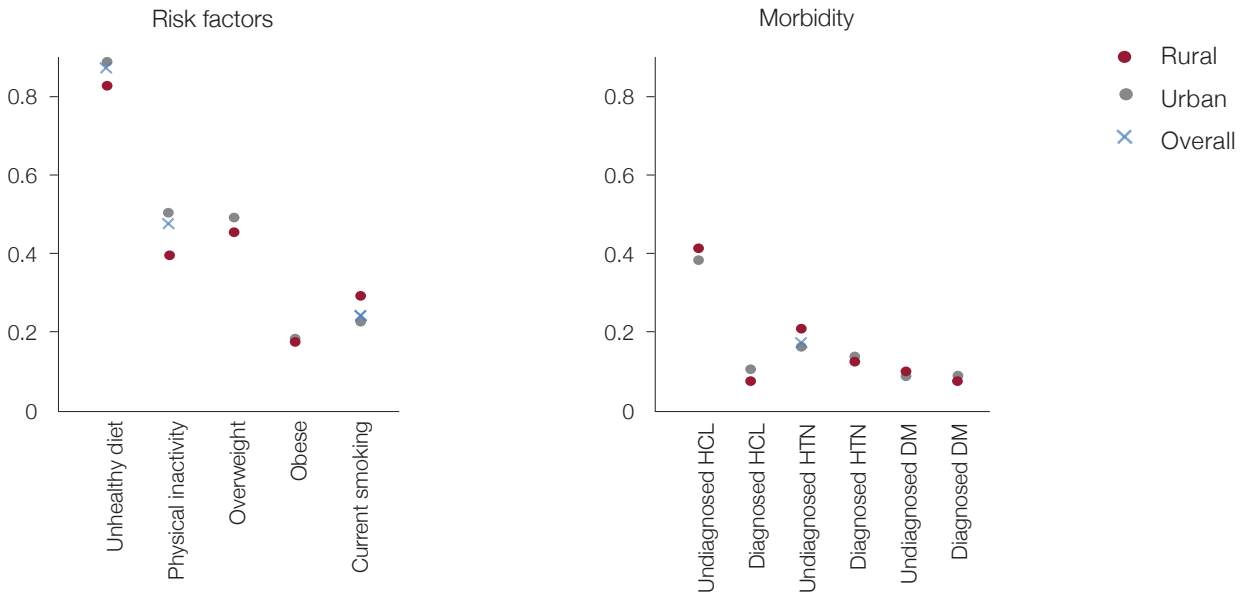


Data source: NHMS 2015. Note: Dots are proportions; HTN=Hypertension, DM=Diabetes, HCL=Hypercholesterolemia

differences in the distribution of risk factors across groups are also reflected in morbidity patterns, most notably in the higher rate of diabetes among Indian Malaysians compared to other ethnic groups [23].

Urban populations are slightly more likely to have an unhealthy diet, and to be physically inactive, while smoking rates are higher in rural areas (Figure 54) [23].

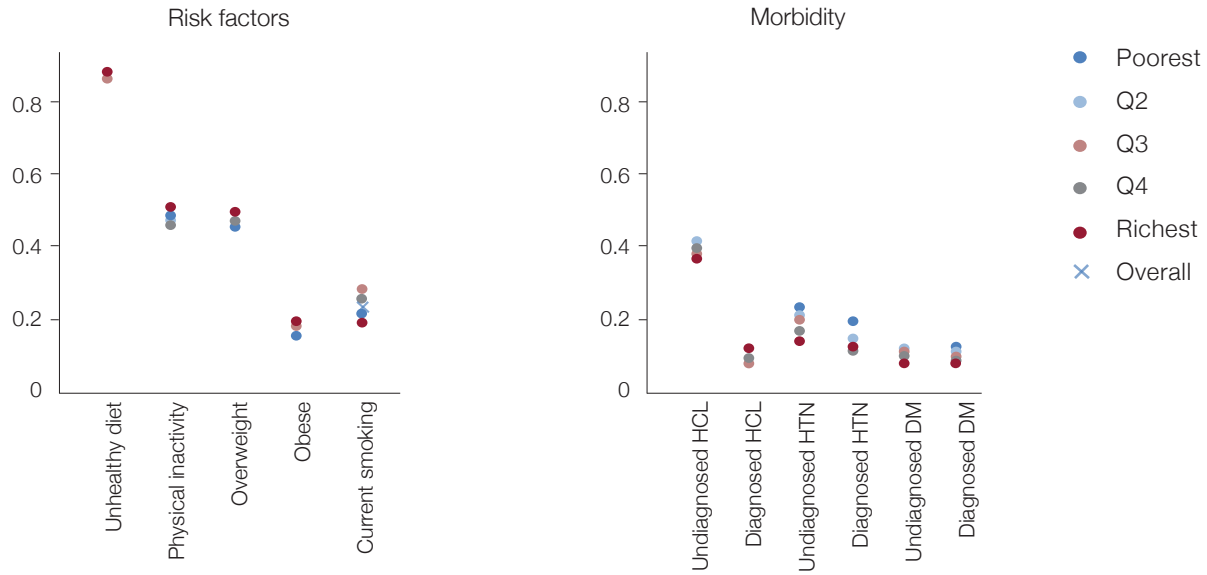
Figure 54. Distribution of Risk Factors and Morbidity by Urban and Rural Residence, Adults (≥18 years), 2015



Data source: NHMS 2015. Note: Dots are proportions; HTN=Hypertension, DM=Diabetes, HCL=Hypercholesterolemia

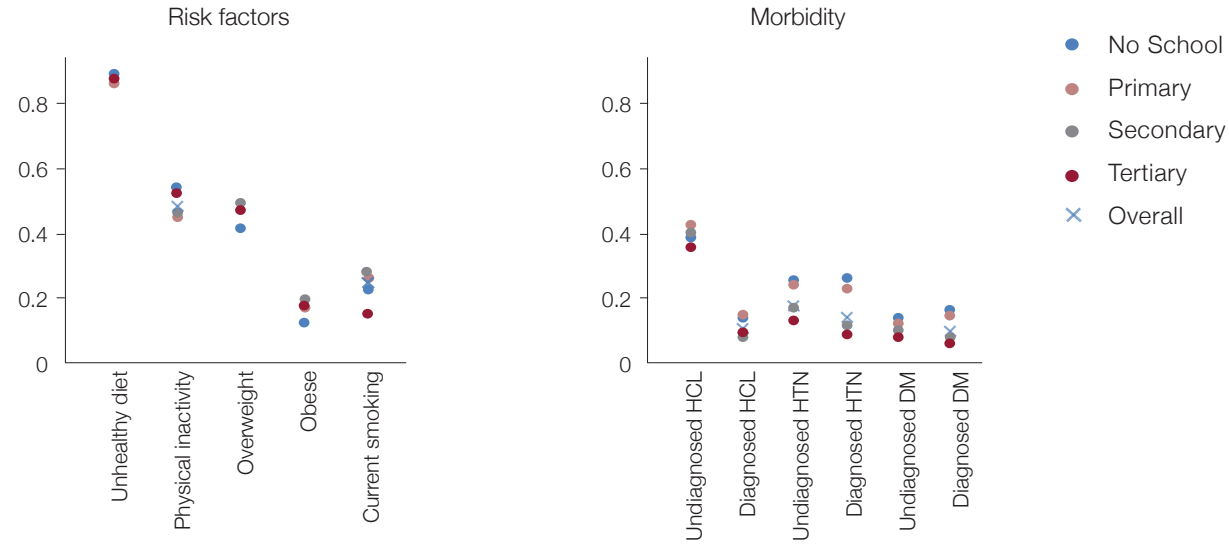
There are minimal differences in the distribution of risk factors by income quintile (estimated using self-reported household expenditures). However, morbidity patterns show greater disparities by socioeconomic status, potentially suggesting that the transition from risk to morbidity is not equally well-managed by the health system for different socioeconomic strata. In addition, different demand patterns for health services and health may lead to varied transition paths to morbidity (Figure 55) [23].

Figure 55. Distribution of Risk Factors and Morbidity by Income Quintile, Adults (≥18 years), 2015



Data source: NHMS 2015. Note: Dots are proportions; Q = Quintile; HTN=Hypertension, DM=Diabetes, HCL=Hypercholesterolemia

Figure 56. Distribution of Risk Factors and Morbidity by Education Levels, Adults (≥18 years), 2015



Data source: NHMS 2015. Note: Dots are proportions; HTN=Hypertension, DM=Diabetes, HCL=Hypercholesterolemia

There are also differences in health outcomes by educational attainment, particularly when it comes to morbidities. Malaysians with lower educational attainment generally have higher prevalence of NCDs, despite the lack of a clear pattern in the distribution of risk factors [23].

We also conducted multivariate analysis to further explore the observed differences in the distribution of risk factors and morbidity by population groups, using non-modifiable risk factors such as age and sex to act as controls. The results are presented in Table 4, with several findings. First, with regard to overall morbidities—including both diagnosed and undiagnosed cases—low income is significantly associated with hypertension (Relative Risk [RR] 1.14 for the poorest income quintile compared to the richest quintile). Second, rural status is associated with lower prevalence of diabetes mellitus (RR 0.83). Third, there are ethnic associations: relative to Malays, other Bumiputera are more likely to have hypertension (RR 1.08), but less likely to have diabetes mellitus (RR 0.81) and hypercholesterolemia (RR 0.93). Indian Malaysians are more likely to have diabetes mellitus (RR 1.57), and Chinese Malaysians are less likely to have hypertension (RR 0.87), diabetes (RR 0.70), and hypercholesterolemia (RR 0.89) [23].

Separate coefficients for diagnosed and undiagnosed disease status provide further nuances to these associations, which may suggest differential access to effective health care. Malaysians from the poorer income quintiles are more likely to have undiagnosed hypertension and undiagnosed diabetes, and less likely to have diagnosed hypercholesterolemia. Similarly, rural status is significantly associated with lower likelihood of being diagnosed with any of the three NCDs, and in the case of hypercholesterolemia, the relative risk is substantially lower (RR 0.71), even though the prevalence of morbidity (including both diagnosed and undiagnosed cases) is not significantly different for rural communities. With regard to hypertension, Indian Malaysians and other Bumiputera have a higher likelihood than Malays of having diagnosed hypertension, while Chinese Malaysians have lower likelihood of undiagnosed hypertension compared to Malays. With regard to diabetes mellitus, Indian Malaysians are more likely than Malays to have diagnosed and undiagnosed diabetes mellitus (Table 4) [23].

These findings challenge the common notion that NCDs are primarily diseases of the rich. In fact, individuals in poorer quintiles are slightly more likely to have hypertension and diabetes mellitus. Second, although there is an extensive network of government health clinics throughout the country, including in rural areas, there are apparent disparities in access to effective health care, with a greater likelihood of having an undiagnosed NCD among the poor, rural communities, and Malays [23].

Table 4. Multivariate Analysis of Factors Associated with Hypertension, Diabetes Mellitus, and Hypercholesterolemia, 2015

	Hypertension						Diabetes Mellitus						Hypercholesterolemia					
	Total		Diagnosed		Undiagnosed		Total		Diagnosed		Undiagnosed		Total		Diagnosed		Undiagnosed	
	RR	(SE)	RR	(SE)	RR	(SE)	RR	(SE)	RR	(SE)	RR	(SE)	RR	(SE)	RR	(SE)	RR	(SE)
Poorest quintile	1.14**	(0.05)	1.01	(0.07)	1.25**	(0.09)	1.09	(0.07)	0.99	(0.09)	1.20*	(0.12)	0.99	(0.03)	0.77**	(0.07)	1.06	(0.04)
Quintile 2	1.14**	(0.05)	1.05	(0.07)	1.22**	(0.08)	1.15**	(0.07)	1.12	(0.10)	1.18*	(0.12)	1.00	(0.03)	0.82**	(0.07)	1.06	(0.04)
Quintile 3	1.17**	(0.05)	1.04	(0.08)	1.28**	(0.09)	1.19**	(0.08)	1.02	(0.10)	1.36**	(0.14)	1.01	(0.03)	0.73**	(0.06)	1.11**	(0.04)
Quintile 4	1.07	(0.05)	0.95	(0.07)	1.17**	(0.08)	1.08	(0.07)	1.03	(0.09)	1.13	(0.12)	1.04	(0.03)	0.84**	(0.07)	1.10**	(0.04)
Richest quintile																		
Young adult 18-39																		
Adult 40-59	2.91**	(0.11)	5.71**	(0.47)	2.10**	(0.10)	2.61**	(0.13)	6.09**	(0.67)	1.62**	(0.11)	1.71**	(0.04)	5.27**	(0.46)	1.41**	(0.04)
Elderly 60+	4.39**	(0.18)	12.06**	(1.03)	2.20**	(0.13)	3.86**	(0.23)	11.97**	(1.41)	1.56**	(0.14)	1.71**	(0.05)	9.38**	(0.89)	1.11**	(0.04)
No school																		
Primary	1.05	(0.04)	1.09	(0.07)	1.03	(0.07)	0.96	(0.06)	1.05	(0.09)	0.86	(0.09)	1.12**	(0.04)	1.26**	(0.12)	1.07	(0.05)
Secondary	0.89**	(0.04)	0.94	(0.07)	0.85**	(0.06)	0.84**	(0.06)	0.9	(0.09)	0.76**	(0.08)	1.05	(0.04)	1.05	(0.11)	1.02	(0.05)
Tertiary	0.85**	(0.05)	0.97	(0.09)	0.79**	(0.07)	0.75**	(0.06)	0.84	(0.10)	0.67**	(0.09)	1.08	(0.05)	1.55**	(0.17)	0.98	(0.06)
Unclassified	0.9	(0.16)	0.76	(0.24)	0.97	(0.23)	0.65*	(0.15)	0.49**	(0.16)	0.7	(0.21)	0.82	(0.11)	0.43*	(0.21)	0.86	(0.12)
Male																		
Female	0.92**	(0.02)	1.08*	(0.04)	0.82**	(0.03)	1.04	(0.04)	1.10*	(0.06)	0.99	(0.06)	1.18**	(0.02)	1.11*	(0.06)	1.21**	(0.03)
Urban																		
Rural	0.99	(0.03)	0.84**	(0.04)	1.11**	(0.05)	0.83**	(0.03)	0.72**	(0.04)	0.93	(0.06)	0.98	(0.02)	0.71**	(0.04)	1.05*	(0.03)
Malay																		
Chinese	0.87**	(0.03)	0.94	(0.05)	0.81**	(0.05)	0.70**	(0.04)	0.63**	(0.05)	0.76**	(0.07)	0.89**	(0.02)	0.91	(0.06)	0.88**	(0.03)
Indian	1.03	(0.05)	1.25**	(0.10)	0.86*	(0.07)	1.40**	(0.08)	1.57**	(0.13)	1.21*	(0.12)	0.97	(0.04)	1.18*	(0.11)	0.92*	(0.04)
Non-Malay Bumi.	1.08*	(0.05)	1.38**	(0.09)	0.9	(0.06)	0.81**	(0.06)	0.85	(0.10)	0.78**	(0.08)	0.93**	(0.03)	1.55**	(0.14)	0.81**	(0.03)
Others	0.81**	(0.06)	0.69**	(0.09)	0.84*	(0.08)	0.74**	(0.07)	0.47**	(0.09)	0.89	(0.10)	0.86**	(0.04)	0.43**	(0.09)	0.90**	(0.05)
Constant	0.16**	(0.01)	0.03**	(0.00)	0.13**	(0.01)	0.13**	(0.01)	0.02**	(0.00)	0.11**	(0.02)	0.33**	(0.02)	0.03**	(0.00)	0.30**	(0.02)
N	19,839		9,839		9,839		9,829		9,829		9,829		19,791		19,791		19,791	

Data source: NHMS 2015. Note: Significance level *10 percent **5 percent; SE = standard error, RR = relative risk using GLM regression of dependent variables on covariates

Non-Communicable Diseases: Multi-morbidity

Almost two-thirds of the adult population in Malaysia has at least one of three NCDs—diabetes mellitus, hypertension, or hypercholesterolemia—according to NHMS 2015 data. More than one quarter (26.3 percent) have at least two of these NCDs, and 7.2 percent have all three of these NCDs (Figure 57) [23]. These multi-morbidities have significant implications for utilization rates and expenditures, as both the utilization of health services and costs of care increase rapidly with the number of morbidities [43].

Chronic Disease Management

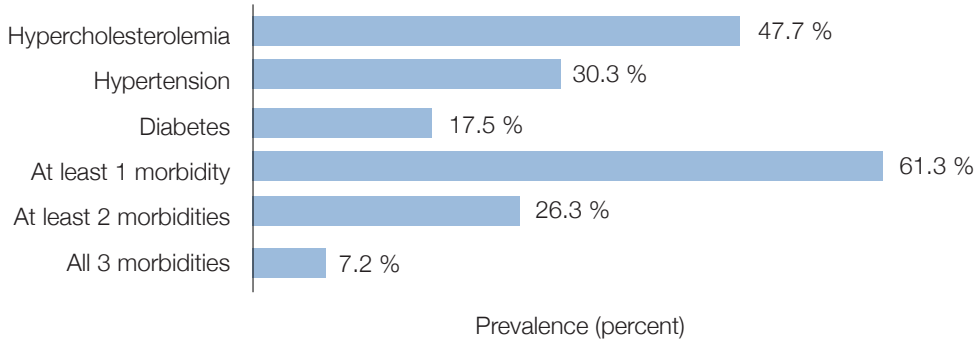
Diabetes Mellitus

According to NHMS data, among those with known diabetes mellitus, 58 percent are treated with oral diabetic agents without insulin and 25 percent are treated with insulin (a slightly lower proportion than the United States, where in 2011, 30.8 percent of adult diabetics were on insulin) [44]. A further 12 percent receive lifestyle advice only and five percent receive no pharmacological treatment and do not recall any lifestyle advice. However, only 38 percent of diabetics had glucose levels within treatment target ranges during the survey—suggesting that around 1.1 million people have uncontrolled diabetes despite having been diagnosed with the condition [23].

Patients with diabetes mellitus also have other morbidities: 75 percent also have hypertension and 70 percent also have hypercholesterolemia (diagnosed or undiagnosed). Treatment control for these morbidities, where diagnosed, is mixed with 48 percent and 29 percent achieving treatment targets for hypercholesterolemia and hypertension respectively, according to NHMS 2015 data, indicating opportunity for improvements (Figure 58) [23].

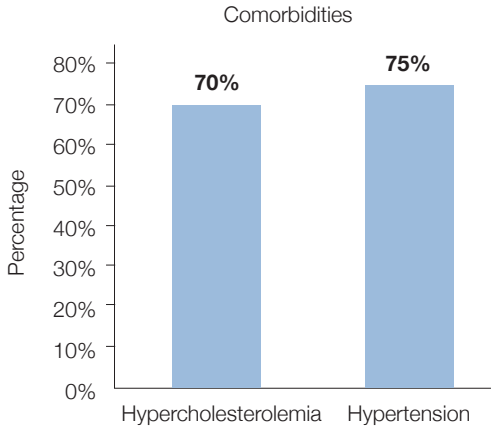
At a population level, diagnosed diabetics seek treatment mainly at public clinics (59 percent), followed by public hospitals (20 percent), and private clinics (15 percent).

Figure 57. Prevalence of NCD Multi-Morbidities, Adults (≥18 years), 2015

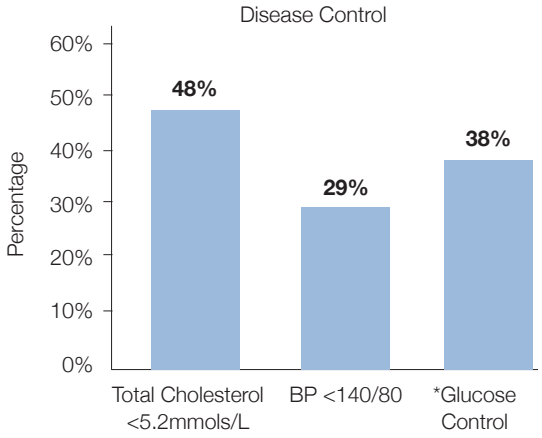


Data source: NHMS (2015)

Figure 58. Diabetes Mellitus Disease Control and Comorbidities in Malaysia, 2015



Data Source: National Health and Morbidity Survey (2015), Adults ≥ 18 years



Note: *Fasting capillary glucose 4.4 - 6.1 and non-fasting capillary glucose 4.4 - 8.0

Hypercholesterolemia

Public clinics are the dominant provider of health care for patients with known hypercholesterolemia, with 50 percent of patients diagnosed with hypercholesterolemia usually seeking care at public clinics and a further 19 percent at public hospitals. Private clinics are sought by 24 percent of patients diagnosed with hypercholesterolemia.

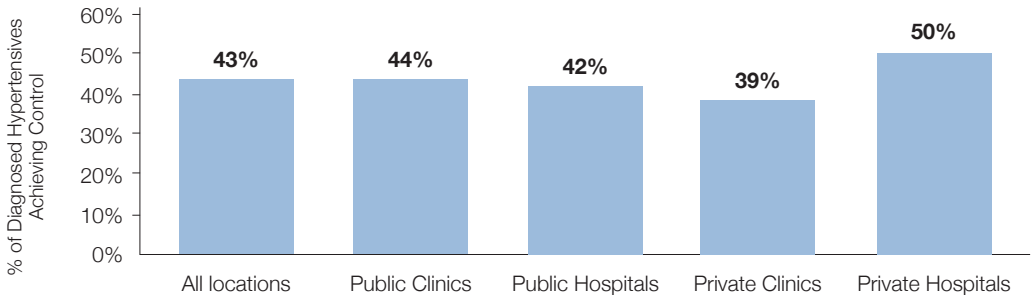
Patients with hypercholesterolemia who seek treatment at public hospitals are the most aggressively treated, with 80 percent using oral medications, and have a relatively higher proportion under control (45 percent). This contrasts with private clinics, where only 44 percent of patients are using oral medications, and only 37 percent have their blood cholesterol levels under control (Total Cholesterol < 5.2 mmol/L). (An important limitation of the survey was the lack of separation into LDL and HDL cholesterol.)

Hypertension

Analysis of NHMS 2015 data reveals that 13.1 percent of the adult population in Malaysia has been diagnosed with hypertension, and a further 17.2 percent (accounting for 57 percent of adults with hypertension) have undiagnosed hypertension.

In Malaysia, public clinics are the dominant provider of health care for hypertension, with 58 percent of patients diagnosed with hypertension usually seeking care at public clinics and a further 18 percent at public hospitals. Private clinics are used by only 19 percent of patients with hypertension. Around 82 percent of patients with hypertension who attend public clinics receive pharmacological treatment compared with only 41 percent who attend private clinics. A higher proportion of patients with hypertension attending hospitals receive treatment (90 percent in public hospitals and 91 percent in private hospitals). However, treatment received by many patients with hypertension is suboptimal, as evidenced by the low

Figure 59. Hypertension Control by Treatment Location, 2015



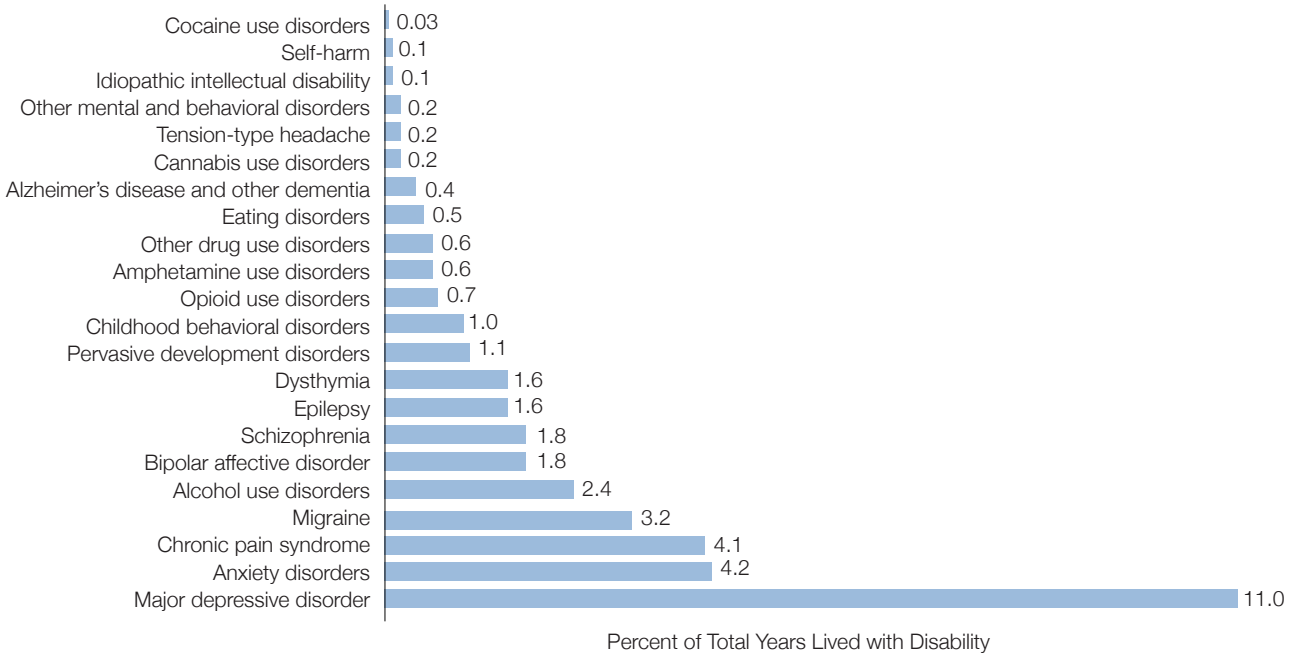
Data Source: National Health and Morbidity Survey (2015); Note: BP≤140/90 and Adults aged ≥18 years

levels of effective control. Just 42.5 percent of patients diagnosed with hypertension achieve the treatment target of ≤140/90 mmHg (44 percent in public clinics and 39 percent in private clinics) (Figure 59).

Mental Health

The burden of mental health diseases in Malaysia is substantial, accounting for about a third (28–37 percent) of Years Lived with Disability (YLDs) and 13–18 percent of total DALYs lost. As individual diseases, five of the 15 single most disabling mental illnesses in Malaysia are classic psychiatric disorders, with major depression at the top of the list, accounting for 11 percent of total YLDs [45] (Figure 60). If diagnosed, many mental illnesses can be effectively treated. Without appropriate diagnosis and treatment, the health, social, and economic costs to individuals, families, and society are large (Box 1) [46].

Figure 60. Composition of Mental Health-Related Disability in Malaysia, 2010



Data Source: Institute for Health Metrics and Evaluation (2010)

BOX 1: Mental Illness

The Economic Cost of Mental Illness in Malaysia

In addition to the burden of disease, mental illness is a leading cause of economic loss at the individual, family, employer, health system, and national levels, due to direct and indirect health costs, absenteeism, lost productivity while at work, and decreased income—all of which result in reduced national economic output. Globally, the cost of mental illness has been estimated at US $2.5 trillion in 2010 and is projected to reach US $6 trillion in 2030 [47]. Applying the framework used to produce these estimates to Malaysia, based on its economic size, total disease burden, and mental illness burden, the estimated loss for Malaysia is US$ 10.6 billion for 2010 and is projected to rise to US $24.3 billion by 2030 [46, 48].

Mental illnesses have a large economic impact because they disproportionately affect young working-age adults. In Malaysia, mental illness burden peaks between 20 and 30 years and accounts for more than 30 percent of total disability between 10 and 44 years (40 percent between 20 and 24 years). In fact, if suicide and certain neurological conditions are included, mental illnesses account for 51 percent of DALYs lost between 20 and 30 years of age [47].

Healthcare Services for Mental Illness

Two separate programs in the Ministry of Health coordinate healthcare services for mental illness. The Medical Program covers specialist psychiatry teams, which encompass neuropsychiatric hospitals, psychiatric units in general hospitals, and community mental health centers. The Public Health Program covers primary care psychiatry teams, which encompass psychiatry services provided at health clinics and a Mental Health Unit which implements mental health promotion, training, and screening for specific disorders. This separation leads to fragmentation of services provided and adversely affects continuity and coordination of care.

Most of the burden of managing mental health services in practice falls on psychiatric units in general hospitals, which manage 90 percent of all new patients, 83 percent of all follow-ups, and 75 percent of all admissions. By contrast, primary care-level mental health only provides nominal coverage, with 0.07 percent of cases seen at clinics classified as mental health cases—far lower than the expected prevalence of mental health conditions in a general clinic setting. As with other chronic conditions, there is minimal counter-referral of mental health cases (only 0.5 patients per clinic per year) from specialist care back to primary care.

Public expenditure on mental health is 1.3 percent of total government health spending, which is less than half the global median of 2.8 percent. However, despite the limited resources, 66 percent of the mental health budget is allocated to neuropsychiatric hospitals—which provide care to a small minority of severely affected mental health patients.

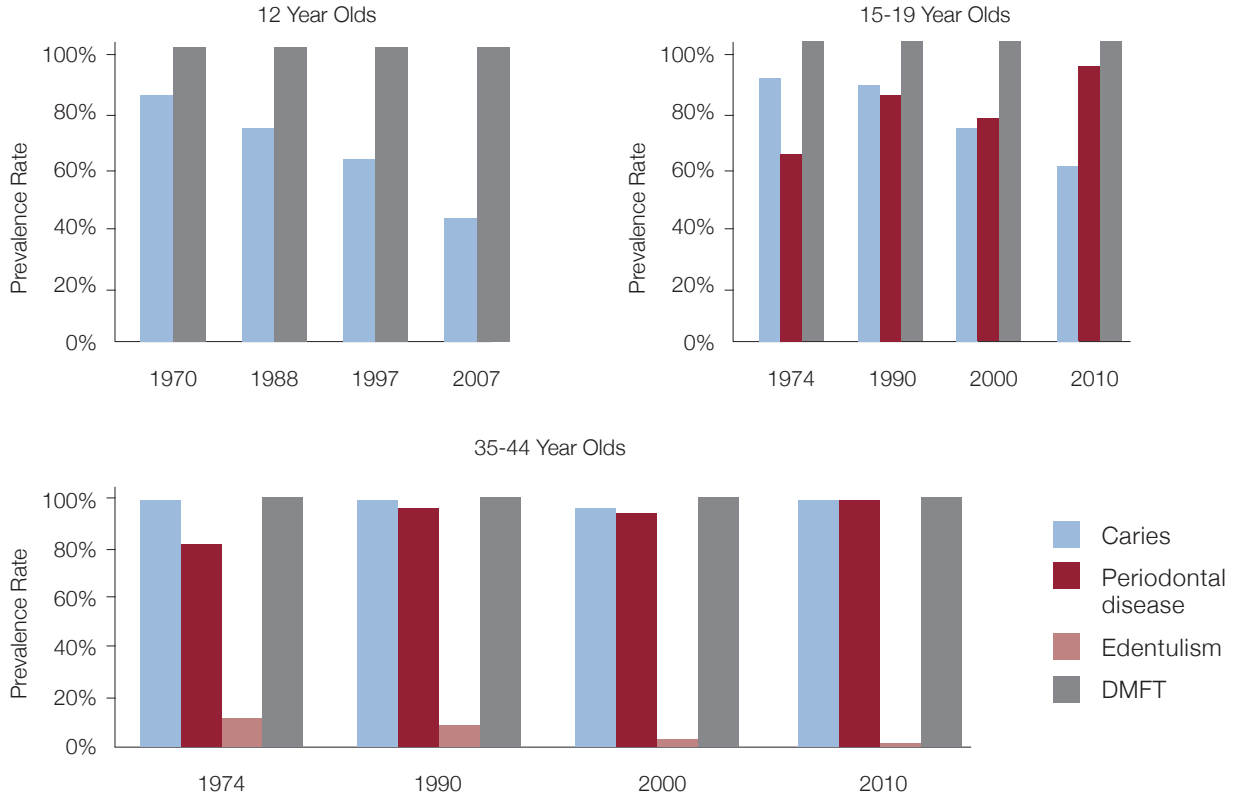
Oral Health

Children aged less than 12 years, and those aged 15 to 19 years, have seen substantial improvements in oral health status. There have been notable decreases, for example, in the caries prevalence rate (Figure 61), and the proportion of primary school children deemed 'orally fit' has also increased in recent years. In 2015, 70 percent of children aged five years in Malaysia had untreated caries. While the prevalence rate is down slightly from a decade earlier, it is very high compared to older children [49].

According to the most recent data (2007), about two out of three primary school children have attained orally fit status. Decayed, missing and filled teeth (DMFT) scores have fallen substantially among children of school age. By contrast, pre-school children are experiencing a high burden of oral disease.

There have also been improvements in oral health status among adults, but these improvements have been less dramatic than those achieved for children. For example, among adults aged 35 to 44 years, caries prevalence has not declined but edentulism rates and DMFT scores have. The prevalence of periodontal disease is also increasing (Figure 61). There is limited time series data on the oral health of the elderly population in Malaysia, but among those 65 years of age and older, there has been improvement in oral health status. Edentulism rates declined from 57 percent in 1990 to 39 percent in 2010, and

Figure 61. Oral Health Status Measures, by Age Group



Data Source: National Oral Health Surveys of School Children (2007); National Oral Health Survey of Adults (2000, 2010)

there was a small increase between 2000 and 2010 in the percent with minimum functioning dentition. DMFT scores declined steadily, as well [49].

Performance on oral health outcomes in Malaysia is mixed in relation to other countries. One useful measure to examine is DALYs arising from oral diseases. Based on the most up-to date-data from the global burden of disease study, the overall disease burden arising from oral health conditions in Malaysia is slightly higher than expected given Malaysia's population size, gross domestic product, age structure, and health spending levels [50]. However, within a smaller set of OECD and Southeast Asian comparison countries, Malaysia outperforms Brazil, Chile, Poland, and Turkey. At the same time, Thailand, Singapore, and all of the OECD countries outperform Malaysia on the burden of oral disease relative to population size, age structure, gross domestic product, and health spending levels [49].

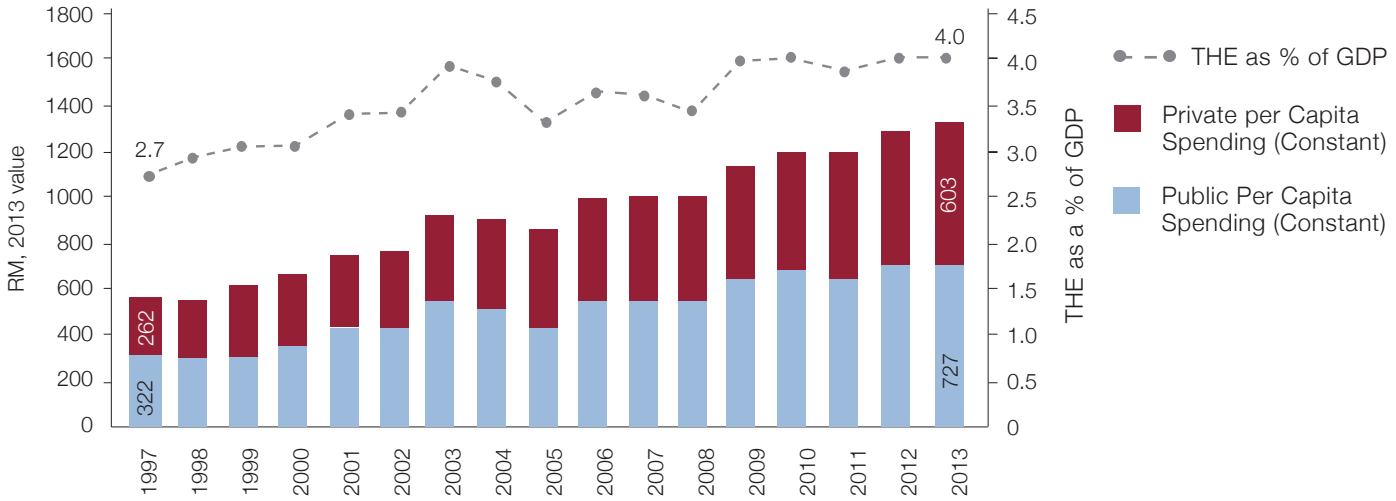
4.2. Cost Growth

One of the principal health policy challenges confronting all countries worldwide is rising expenditure on health care. Historically, the growth of health expenditure has outpaced economic growth, meaning that health spending as a share of gross domestic product (GDP) rises over time. For example, between 1970 and 2002, the 'excess growth' of health spending in OECD countries other than the U.S. (real increases in health spending that cannot be explained by rising incomes or population ageing) was 1.1 percent [51]. While a growing share of health spending as a proportion of GDP is not a negative outcome in and of itself (health care is also a productive sector of the economy), rising health spending can place strain on the budgets of those who pay for health care—typically the government as well as households and often employers in systems where employer-provided health insurance is an important source of financing.

Despite its overall low spending on health care as a percent of GDP, Malaysia is facing rising expenditures. In 1997 health care expenditure was 2.7 percent of GDP, compared to 4.0 percent in 2013 (based on Malaysian National Health Accounts estimates using the SHA framework). Over this same period, per person health spending more than doubled in real terms, from RM 584 to RM 1,330 in 2013 prices (Figure 62) [37]. Despite this long-term pattern of growing health expenditures, there have been shorter-term periods of stability in health spending; for example, Malaysia's health spending as a share of GDP has remained essentially unchanged between 2009 and 2013. This recent trend in expenditures has coincided with the global financial crisis, which began in 2009; and a similar pattern can be observed among international comparators, including Turkey, Estonia, Brazil, Mexico, and most OECD countries [37].

Several factors contribute to rising health expenditures. One factor is income. As incomes rise, societies naturally spend more on health care. People demand both a higher quantity of healthcare services, as well higher levels of service quality—amenities such as private rooms, upgraded facilities, shorter waiting times, and greater choice. In Malaysia, while there are limited trend data on how perceptions of service quality have changed over time, MHSR analyses suggest that concerns about these dimensions of service quality drive differences in perceptions

Figure 62. Total Health Expenditure and per Capita Spending in Malaysia, 1997–2013



Data Source: Malaysian National Health Accounts (System of Health Accounts Framework 2013)

and use of public and private facilities [27]. Patient preferences for enhanced service quality can at least partially explain the significant demand observed for private services despite universal access to health care services provided by the government that are readily accessible for most citizens and nearly free at the point of contact.

Demographic and epidemiological changes also impact healthcare spending. Ageing populations require more healthcare services over time, as the elderly have higher healthcare utilization. In Malaysia, the growing burden of NCDs will also place increasing upward pressure on the health budget, especially given the current patterns of management of these diseases. For example, uncontrolled diabetes leads to complications that are very expensive to treat, such as kidney failure requiring hemodialysis. Current analysis is underway to model the implications of NCDs on health spending and economic growth [37].

Changing service delivery models and utilization patterns can also impact costs and spending, in either direction. For example, better care coordination, use of information technology, or investment in primary care services such as disease management can create efficiencies and put downward pressure on costs. On the other hand, expanding the availability and use of expensive services will increase costs. In the Malaysian public sector, rates of certain costly procedures such as coronary artery bypass grafting (CABG), percutaneous coronary intervention (PCI), total hip replacement, and total knee replacement, as well as rates of imaging diagnostics (such as MRI and CT scans) are relatively low compared to OECD country comparators [23], which suggests that costs may rise if these services become increasingly available. On the other hand, the high proportion of resources devoted to secondary and tertiary care—as opposed to primary care—indicates potential for efficiencies in the health system (Section

3.3.1). Analysis of NHMS data also suggests that aggregate healthcare utilization is still relatively low in Malaysia, especially for outpatient care (Section 3.1.2). As utilization of health services expands, this will increase expenditures.

Different provider payment systems affect healthcare costs differently. For example, there is substantial evidence that systems based on fee-for-service payment are cost-inflationary [52]. Malaysia's private health care sector—combining private providers driven by profit motives with private health insurance companies that have limited market power and function as passive payers on a fee-for-service basis—is likely to lead to growing costs over time. Private health insurance also has high administrative costs; in Malaysia the combined cost of management expenses and commissions is around 20–25 percent of insurance premium revenues, according to Bank Negara [53]. By contrast, the payment mechanisms used in the Ministry of Health system—including line-item budgets and salaries—tend to be more effective in controlling cost and expenditure growth over time, though they have drawbacks [7]. Among high-income countries, those that have health systems where the government exerts strong control over budgets and access to services, such as the United Kingdom and Canada, have historically been more successful at reining in expenditures [52].

While demographic and epidemiological change, growing incomes, changing patterns of service delivery and utilization, and financing systems all contribute to healthcare spending, the largest single factor driving rising healthcare costs at the international level is technological change. Advances in medical technology—new drugs, medical devices, diagnostics, and surgical procedures—can explain the bulk of the increase in healthcare costs seen in the United States and internationally since the 1950s [54]. Because innovations spread rapidly across borders, the advance of medical technology is largely outside of the control of any given country, although policies can affect how rapidly or extensively these technologies are adopted.

Of course, the advance of medical science, while contributing to rising healthcare costs, has also brought enormous benefits in terms of extending and improving life. The fact that healthcare expenditures rise over time does not necessarily indicate waste or inefficiency. Several studies, which have analyzed the value of rising healthcare expenditures in terms of the benefits gained through increased life years, conclude that the rising investment in health observed in high-income countries is well justified [55, 56].

On the other hand, rising health expenditures can strain public budgets and affect productivity by driving up marginal tax rates or increasing costs for employers, if employers play a role in financing health care. Anecdotal evidence gathered by MHSR suggests that this is a growing issue for large employers in Malaysia, which are increasingly providing health insurance or directly funding healthcare services as part of their remuneration packages to attract and retain skilled employees. Therefore, while a rise in healthcare spending is to some degree inevitable, and may represent good 'value for money,' it also presents a policy challenge in terms of how to most efficiently finance that spending in the long run.

4.3. Opportunities

Changing contextual factors also present important opportunities for Malaysia's health system and its broader economy. For example, if properly harnessed, the health sector has enormous growth potential. Already, Malaysia's exports of health-related products (pharmaceuticals, medical devices, diagnostic equipment, etc.) have grown from US$ 154 million in 1995 to US$ 1,064 million in 2013, almost a seven-fold increase in 18 years [57]. The manufacture of pharmaceutical products and medical devices, in particular, has been a dynamic area of growth. However, other middle-income and regional comparators have experienced even more rapid export growth. Starting from a similar level as Malaysia in 1995, Brazil's exports of health-related products have reached US $2.25 billion, a 14-fold increase. South Korea's health-related exports increased over 13-fold to US$ 3.15 billion. Singapore has seen the most impressive growth, with health-related exports increasing over 40 times. Exports of healthcare products now earn Singaporean producers over US$ 10 billion, and are a major driver of the economy [57].

While Malaysia, Korea, and Brazil still run substantial trade deficits in healthcare products (with the balance of trade deteriorating for all three countries between 1995 and 2013), Singapore runs a US$ 6.8 billion trade surplus. Singaporean experience suggests that the potential for future growth in production of pharmaceuticals and other medical products is substantial [57]. Health information technology and telemedicine also present promising areas for growth, and investment in these technologies will complement future changes in healthcare delivery.

The growth of private healthcare providers can also have broad economic benefits. From four private hospitals in 1980 to 267 today, the private hospital sector has been a booming industry [23]. One opportunity that the Government of Malaysia has been promoting is medical tourism, both through a national Entry Point Project, and the establishment of the Malaysia Healthcare Travel Council. A total of 882,000 foreigners received medical care in Malaysia in 2014, according to the Council. PEMANDU reports that total medical tourism revenues reached RM 683 million in 2013, but that Malaysia has been outperformed by regional competitors Thailand and Singapore [58]. With the majority of health tourists in Malaysia still coming from Indonesia, there is opportunity for the industry to target new markets.

The private healthcare industry, which includes both for-profit and not-for-profit providers, can also expand to serve domestic demand. As Malaysia transitions to an ageing society, the demand for long-term care and other elderly care services will increase. The growth of this industry will also meet a pressing health need in Malaysia and reduce pressure on public hospitals, which currently provide many long-term care services.

Another major aspect of Malaysia's changing contextual environment is the recently-negotiated Trans-Pacific Partnership Agreement (TPPA). The TPPA contains several provisions that could affect Malaysia's health system. For example, there has been debate about whether the agreement's intellectual property provisions will increase pharmaceutical costs. The TPPA agreements on intellectual property largely reinforce the existing requirements of the Trade-Related Aspects of Intellectual Property

Rights (TRIPS) agreement, and thus their additional impact is unclear [59-61]. Another concern that has been debated is that TPPA regulations will interfere with national policy in administering drug formularies. On the other hand, stipulations included in the agreement about government procurement may exert downward pressure on prices by requiring equal treatment for foreign and domestic producers. The overall impact of the TPPA on pharmaceutical prices remains unclear. Other provisions of the TPPA that may affect health are rules that could limit the ability of member governments to regulate the marketing of alcohol and tobacco products. On a broader level, the TPPA is expected to expand trade opportunities and enhance the competitiveness of Malaysian industry, which can also benefit the health care industry in areas such as pharmaceutical exports and medical tourism.

Beyond economic opportunities, we see several additional opportunities for Malaysia related to health system reform. First, there is great potential for improving health system outcomes by influencing the behavior of citizens and how they interact with the health system. Effective management of emerging health needs such as NCDs requires not just high quality clinical services; it also requires patients who seek out and demand preventive care, who are motivated to engage in health-producing behaviors and undertake lifestyle changes, and who actively participate in their care. As a population with relatively high human capital, there is great potential to improve health outcomes through demand-side interventions to change individual behaviors, discussed further in Section 6.

Second, Malaysia's comparatively low health care spending places the country in a favorable position with respect to the future development of the health system. By harnessing alternative, non-government sources of health financing, Malaysia can develop effective health system solutions that will reduce future burdens, and could even avoid some of the pitfalls encountered by some higher-income countries. The country is at an opportune point in its development to undertake such reforms.

Third, health system reform provides an important political opportunity to enhance the social contract between the government and society and thereby help the government to achieve its objectives as set out in Malaysia's Vision 2020. Responding to sources of dissatisfaction with current services, providing additional choice, and reorganizing care to better meet the emerging health needs of the population can increase citizen satisfaction with the health system, and with the government more broadly.

5. Health Systems Functions: Overview

5.1. Organization and Governance

National Level

Important functions of the government health system, such as policy making, regulation, and planning are centralized at the Ministry of Health, which is also the primary provider of government health services in Malaysia. Other ministries—such as the Ministry of Defense, Ministry of Higher Education, Ministry of Urban Wellbeing, Housing, and Local Government, and the Ministry of Federal Territories—are also involved in the provision of health services. Although health is the responsibility of the federal government, state governments also play a role, especially in public health [23].

The private sector—including the for-profit sector, not-for-profit non-governmental organizations (NGOs), educational establishments, and individual practitioners—also contribute substantially toward the provision of health care services, and are regulated under the Private Healthcare Facilities and Services Act [23].

The MOH is organized by six technical programs—Public Health (which includes public health and primary health care), Medical (hospitals and specialist care), Oral Health, Pharmaceutical Services, Food Safety and Quality, and Research & Technical Support—each led by either a Deputy Director General (DDG) or Principal Director, who reports to the Director General of Health. In addition, various administrative arms of the ministry, including Management and Finance, are led by respective Deputy Secretary Generals and report directly to the Secretary General [23] (Appendix 2, Figure A2.1).

Public Health and Primary Health Care

Public health services in Malaysia, comprising population-level (or 'collective') health services aimed at the population, and primary health care services, including preventive, promotive, and curative services at an individual or 'personal' level, are part of the same technical program, Public Health. This is comprised of four divisions—Disease Control, Health Promotion (formerly Health Education), Nutrition, and Family Health Development (Appendix 2, Figure A2.2). The first three divisions are responsible mainly for population-level health care while the Family Health Development Division is responsible for both population-level health care (through family health activities) and personal health care. In addition to the Public Health Program, other programs also play an important public health role. For example, the Oral Health Program is responsible for dental public health and the Food Safety and Quality Program is responsible for regulatory aspects related to food safety. Each division is further subdivided into sections with responsibility for specific aspects of divisional programs. For example, the Disease Control Division has sections for both communicable and non-communicable diseases, which are distinct from the sections under the Health Promotion Division for Healthy Lifestyles, Research, and Public Health [23].

Secondary and Tertiary Health Care

Several ministries are involved in the provision of secondary and tertiary health care (STHC)—namely, the Ministry of Health, the Ministry of Higher Education (which is responsible for three university hospitals), and the Ministry of Defense (which is responsible for five military hospitals). Within the Ministry of Health, STHC is the responsibility of the Medical Program, led by the DDG (Medical) [23].

Sub-National Level

Decentralization of Ministry of Health functions is in the form of de-concentration to the sub-national level through state health departments and district health offices.

State health departments mirror the central Ministry's programmatic structure for each of the technical programs. The only exception is the Research and Technical Support Program, which operates only at the central level (apart from the Engineering Services Division, which is run at the state level) [23].

Reporting at state level reflects the programmatic structure of the Ministry: Deputy State Health Directors (in charge of respective programs) report both to the State Health Director and to the central-level program leads. State Hospitals, which are important public providers of tertiary health care, are managed by the state health departments, with the Hospital Director reporting to both the State Health Director and the Deputy State Health Director (Medical) [23] (Appendix 2, Figure A2.3).

Organization of district health offices mirrors that of the central Ministry and state health departments. District health offices manage district-level public health through several divisions, oversee regulatory, management and pharmacy functions, provide collective health services, and have responsibility for critical service delivery units—including health clinics, community clinics, maternal and child health clinics, dental clinics, mobile clinics, flying doctor services, and 1Malaysia clinics. Secondary (and to some extent tertiary) health care is represented at the district level through the district hospital. Oral health is represented through the district dental health office [23] (Appendix 2, Figure A2.4.).

5.2. Service Delivery

5.2.1. Overview

Key Service Delivery Indicators

Between 1970 and 2014, Malaysia's health services and health system infrastructure expanded at rapid rates (Table 5), often exceeding population growth. For example, the number of doctors has doubled every decade from 1980 to 2010, to reach a doctor to population ratio of 1.47 per 1,000 population in 2014. Public infrastructure for health services—hospitals, hospital beds, and clinics—also grew steadily until 2000 and plateaued thereafter, with declining bed to population ratio, which fell from 2.44 beds per 1,000 population in 1980 to 1.85 beds per 1,000 population in 2014 [23].

Health facilities are spread throughout the country, with Ministry of Health clinics present even in remote and rural areas of Sabah and Sarawak (Figure 63). Private clinics and private hospitals are typically

concentrated in urban areas, especially on the west coast of Peninsular Malaysia, while public hospitals are present in almost every major town in the country [23].

5.2.2. Primary Health Care (Medical)

Scale, Scope, and Distribution

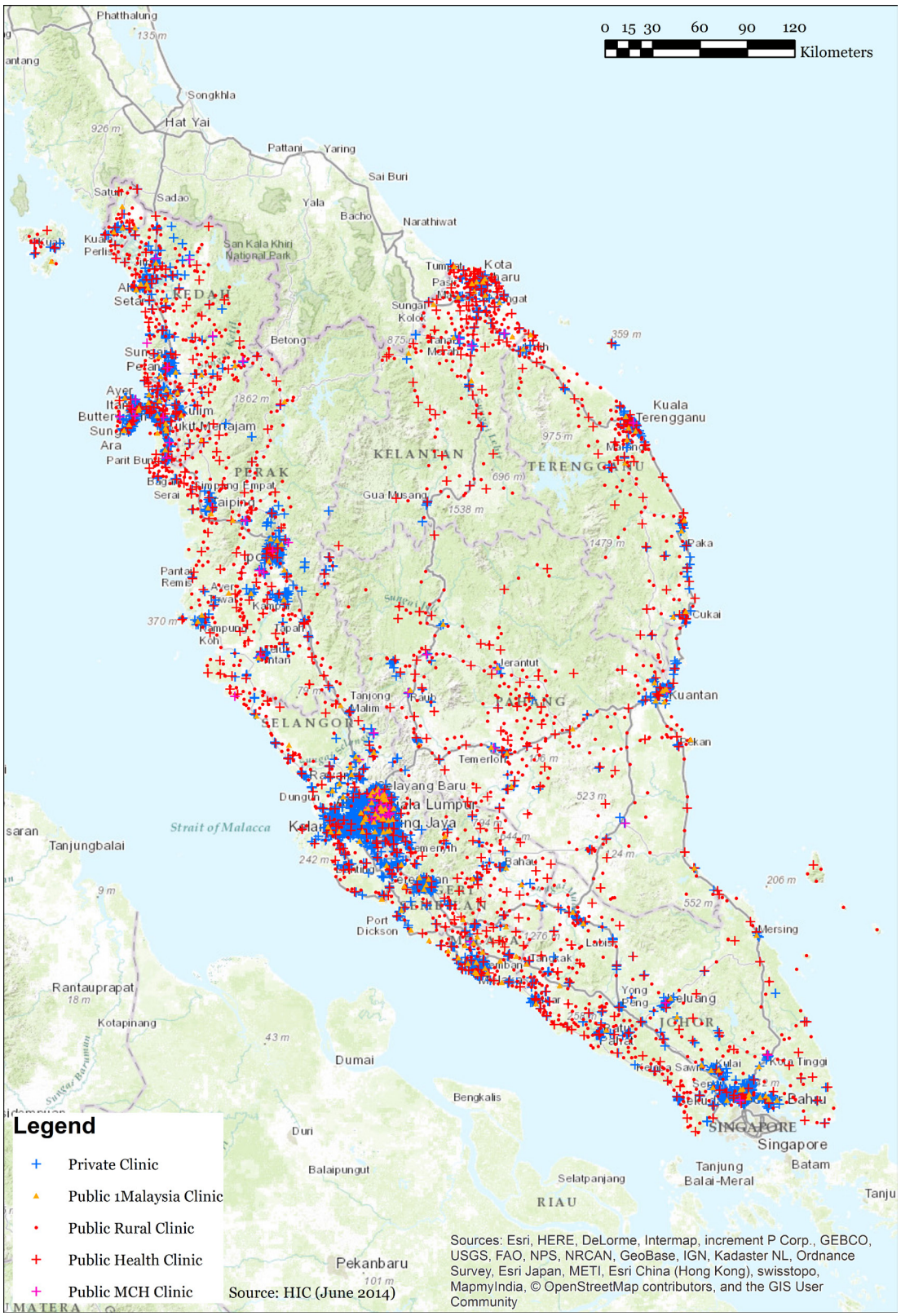
The primary health care (PHC) system in Malaysia is a mixed system, with both public (2,871 facilities) and private (6,978 facilities) providers playing an important role in service provision [23]. The public sector, which has an extensive network of health clinics, community clinics (serving rural populations), 1Malaysia clinics (serving mainly urban populations), and mobile clinics (serving remote populations)—spread throughout the country—provides almost two-thirds (60 percent) of outpatient care, but accounts for about one-third (35 percent) of total expenditure on primary care (see Table 6 for a typology of public clinics). The case mix encountered by public primary care providers is

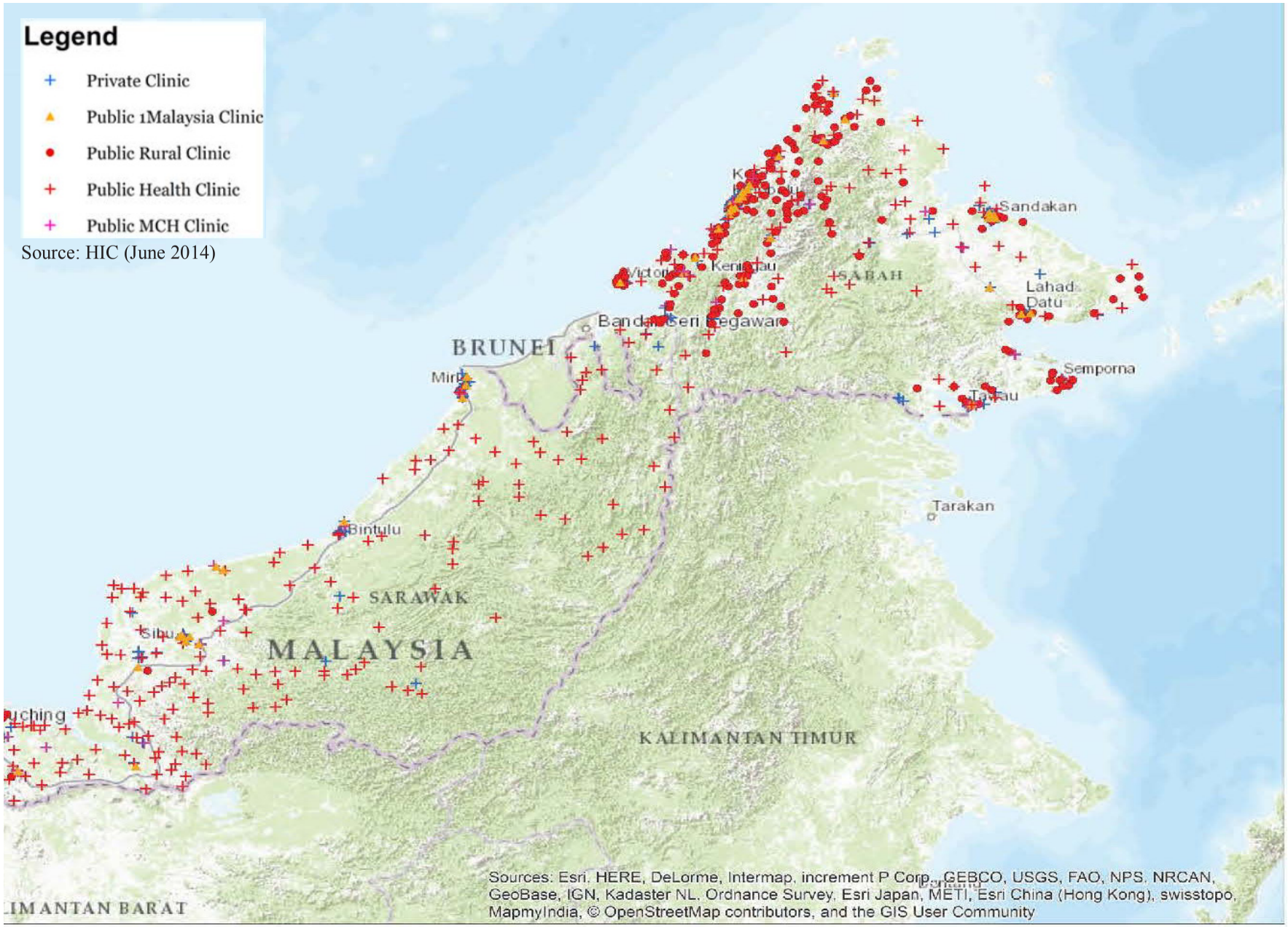
Table 5. Key Health Service Delivery Supply-Side Indicators, 1970–2014

	1970	1980	1990	2000	2010	2014
Public MOH Clinics	1,167	2,234	2,588	2,871	2,886	2,871
Private Clinics	n/a	n/a	n/a	n/a	6,442	6,978
Total	1,167	2,234	2,588	2,871	9,328	9,849
Clinics per 1,000 population	**0.11**	**0.16**	**0.14**	**0.12**	**0.33**	**0.32**
Public Hospitals	72	88	95	113	145	150
*Private Hospitals	6	14	63	224	251	291
Total	78	102	158	337	396	441
Hospitals per 100,000 population	**0.72**	**0.73**	**0.87**	**1.43**	**1.39**	**1.42**
Public Hospital Beds	17,063	33,901	33,400	34,573	37,793	43,822
Private Hospital Beds	N/A	N/A	4,675	9,547	13,186	13,797
Total	17,063	33,901	38,075	44,120	50,979	57,619
Hospital Beds per 1,000 population	**1.57**	**2.44**	**2.10**	**1.88**	**1.78**	**1.85**
Doctors	2,370	3,514	7,012	15,619	32,979	45,565
Doctors per 1,000 population	**0.22**	**0.25**	**0.39**	**0.66**	**1.15**	**1.47**
Population	**10,881,535**	**13,879,237**	**18,102,362**	**23,494,900**	**28,588,600**	**30,979,000**

Data Source: Health Facts, MOH; Malaysia Health Systems Review 2013, WHO; NHEWS.
Note: Information on private hospitals may be incomplete and does not include hospitals which may have operated in the past if they have since closed.
These figures exclude housemen (trainee doctors). If housemen are included, the ratio is 1.72 doctors per 1,000 population in 2014, or a total of 51,835 doctors. Source: Health Informatics Center (as of 31 December 2014).

Figure 63. Distribution of Public and Private PHC Facilities in (a) West Malaysia; and (b) Sabah, Sarawak, and Labuan, 2014





Source: HIC (June 2014)

predominantly chronic illnesses and maternal and child health conditions. In contrast, private providers encounter mainly acute conditions, but account for 40 percent of utilization and 65 percent of expenditures for PHC (Table 7) [23].

These national averages mask important geographic variations in the provision of and access to health services. Private primary care providers are clustered in urban areas, especially in the west coast of Peninsular Malaysia (Figure 64), while public primary care providers serve both rural and urban populations. These geographic differences are important considerations to be aware of, as different populations effectively have access to different healthcare services depending on location [23].

Table 6. Public Primary Health Care Facility Network

Facility	Service Coverage	Human Resources	Geographic Context	Notes
Health Clinics (KKs); Types 1-7	Wide range of service coverage - from comprehensive child and adult curative and preventive ambulatory care to more basic services, depending on staffing and supporting services. MCH and dental services may be included when these clinics are co-located/combined.	Led by either family medicine specialist, medical officer, or medical assistant	Urban and rural	Can be co-located/combined with a MCH clinic, dental clinic, and/or district hospital. Ranges from large, typically urban, health clinics (Type 1-3) led by a family medicine specialist with supporting services which include pharmacy, laboratory, and radiology support, to smaller health clinics in rural areas which are staffed by medical assistants. Type 4-6 are smaller health clinics, and type 7 is a recently added type representing the smallest health clinics (in some instances, these are upgraded community clinics, where service scope has been expanded).
Community Clinics	Maternal and child health services and basic curative services	Led by staff nurses or community nurses	Rural	
1Malaysia Clinics	Basic curative services	Usually led by medical assistant, but recently medical officers have been posted to these clinics	Urban, to serve the urban poor	Out-of-hours coverage; Rented facilities
Maternal and Child Health Clinics	Maternal and child health	Doctors, midwives and/or nurses	Urban and rural	Can be combined into health clinics
Mobile Clinics	Maternal and child health and basic curative services	Usually led by a medical assistant and/or nursing staff, but may also include medical officers	Remote rural areas; requiring access by boat, 4WD, or helicopter	

Data Source: *Personal correspondence with MOH officials*

Table 7. Summary Statistics on Financing and Utilization of Public and Private Primary Health Care

Indicator	Public Facilities	**Private Clinics** *(includes primary care GPs and specialist clinics)*
Expenditure, as % of primary health care expenditure (2013)[1] *Source: MNHA*	35%	65%
Utilization rate of outpatient service, visits per person per year (2015)[2] *Source: NHMS 2015; Outpatient services include specialist outpatient consultations; implausible outliers excluded*	2.0	1.3
Utilization of outpatient services, as % of total outpatient utilization (2015) *Source: NHMS 2015*	60%	40%
Facilities, as % of clinics (2014)[3] *Source: CRC (June 2015)*	General practices - 11%	General practitioners - 70% Specialist clinics - 11% Other - 8%
Facilities, as % of clinics (2014) *Source: HIC*	31%[4]	69%[5]
Doctors, # *Source: BPKK*	3,132 MOs, excluding FMS (2014)	N/A
Top 4 reasons for encounters *Source: NMCS 2012 Primary health care*[6]	Hypertension, diabetes, lipid disorder, pregnancy *i.e., chronic illnesses and MCH*	Fever, cough, abdominal pain, diarrhea *i.e., acute conditions/symptoms*

[1]Based on discussions with government officials, it is understood that a refinement of the MNHA-based definition of PHC is being established, but these data were not available at time of writing.

[2]Note: Outpatient primary care vs specialist care is not differentiated in the NHMS questionnaire.

[3]This includes greater granularity with respect to the types of private clinics but is not a census of all such facilities.

[4]This includes health clinics (KK).

[5]This figure includes private primary care (general practitioners) and specialist outpatient clinics.

[6]Note that this excludes private specialist outpatient clinics.

Figure 64. Geographic Location and Density (Private:Public Ratio) of Public and Private Clinics in Malaysia

Data source: MoH HIC (June 2014; Public = MoH clinics only) and CKAPS (June 2015)

5.2.3. Secondary and Tertiary Health Care

Scale, Scope, and Distribution

As with the primary care, Malaysia has mixed provision of secondary and tertiary health care (STHC) services, with public hospitals (150) and private facilities (291, including hospitals, nursing homes, maternity homes, ambulatory care centers, and hospices). The public sector accounts for two-thirds of the expenditures on secondary and tertiary health care services and three-quarters of utilization and beds (Table 8). Private hospitals are more numerous, but are smaller in size (with fewer beds on average), and manage around one-quarter to one-third of all inpatient admissions (23 percent of total admissions according to population surveys or 31 percent according to facility administrative records) [23].

The case mix for inpatient admissions at both public and private hospitals is comparable, and childbirth and acute infections are the predominant discharge diagnoses (Table 8) [23].

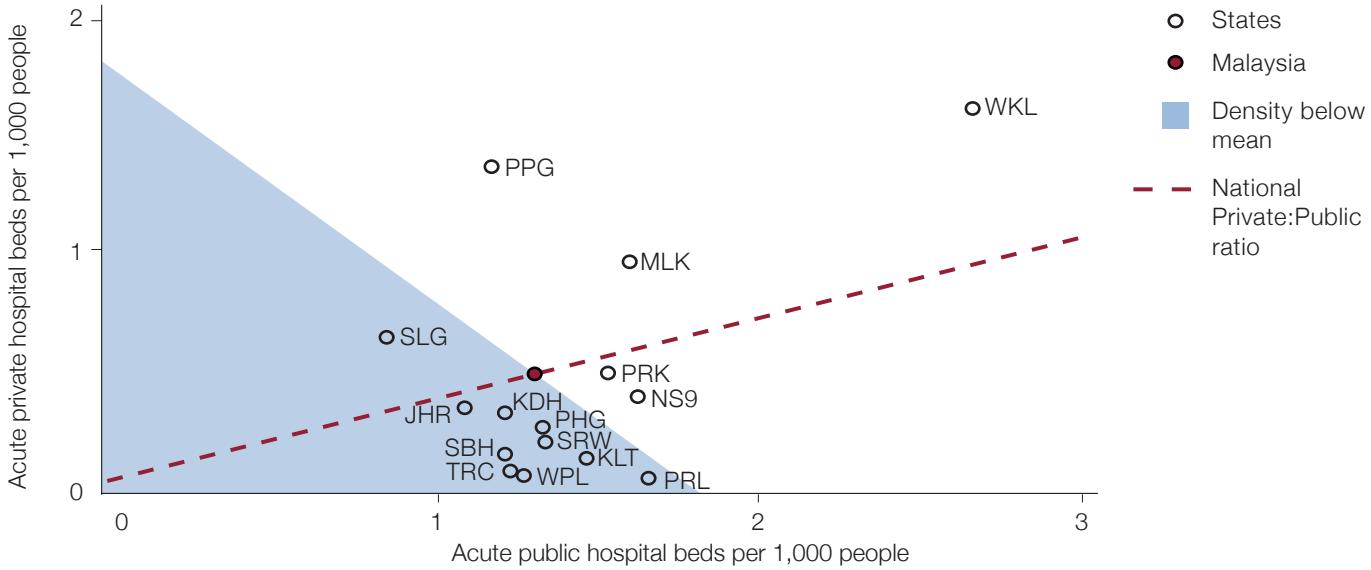
There are important geographic differences in the distribution of public and private hospitals and hospital beds. Penang (PPG), Melaka (MLK), Kuala Lumpur (WKL), Perak (PRK), and Negeri Sembilan (N9) are states with greater than national average bed density. However, Penang, Melaka, and Kuala Lumpur have greater numbers of private sector providers—with a greater ratio of private to public beds—than Perak and Negeri Sembilan. Selangor (SLG), the most populous state in Malaysia, has fewer beds per 1,000 population, but with a higher

Table 8. Summary Statistics for Public and Private Secondary and Tertiary Health Care

Indicator	Public STHC	Private STHC
Expenditure, as % of STHC expenditure (2013) *Source: MNHA*	67%	33%
Utilization rate of inpatient services, admissions per person per year (2015) *Source: NHMS 2015*	0.08	0.02
Utilization of inpatient services, as % of total inpatient utilization (2015) *Source: NHMS 2015*	77%	23%
Inpatient bed-days per person per year (2015) *Source: NHMS 2015*	0.34	0.10
Inpatient bed-days per person per year, as % of total inpatient bed-days (2015) *Source: NHMS 2015*	77%	23%
Admissions, # and % (2014) *Source: Health Facts 2015*	2,407,122 *69%*	1,083,201 *31%*
Hospitals, # and % (2014) *Source: Health Facts 2015*	150 (142 MOH, 8 non-MOH), *36%*	267, *64%*
Acute Beds, % (2014-2015) *Source: HIC and CKAPS*	74% (70% MOH, 4% non-MOH)	26%
Top 3 Discharge Diagnostic Categories (2014) *Source: Health Facts 2015*	Pregnancy, childbirth, and the puerperium; Diseases of the respiratory system; Certain infectious and parasitic diseases	Certain infectious and parasitic diseases; Diseases of the respiratory system; Pregnancy, childbirth, and the puerperium
Top 5 Discharge Diagnoses and ICD-10 code (2013) *Source: SMRP (2013)*	O80.0 - Spontaneous vertex delivery P59.9 - Neonatal jaundice, unspecified J18.9 - Pneumonia, unspecified A90 - Dengue fever [classical dengue] A09.9 - Gastroenteritis and colitis *(excluding daycase)*	O80.0 - Spontaneous vertex delivery A09 - Other gastroenteritis and colitis A90 - Dengue fever [classical dengue] B34.9 - Viral infection, unspecified Z38.0 - Singleton, born in hostpital

Data Source: MHSR Report on Health Service Delivery (2016)

Figure 65. Density of Public and Private Acute Hospital Beds, by State

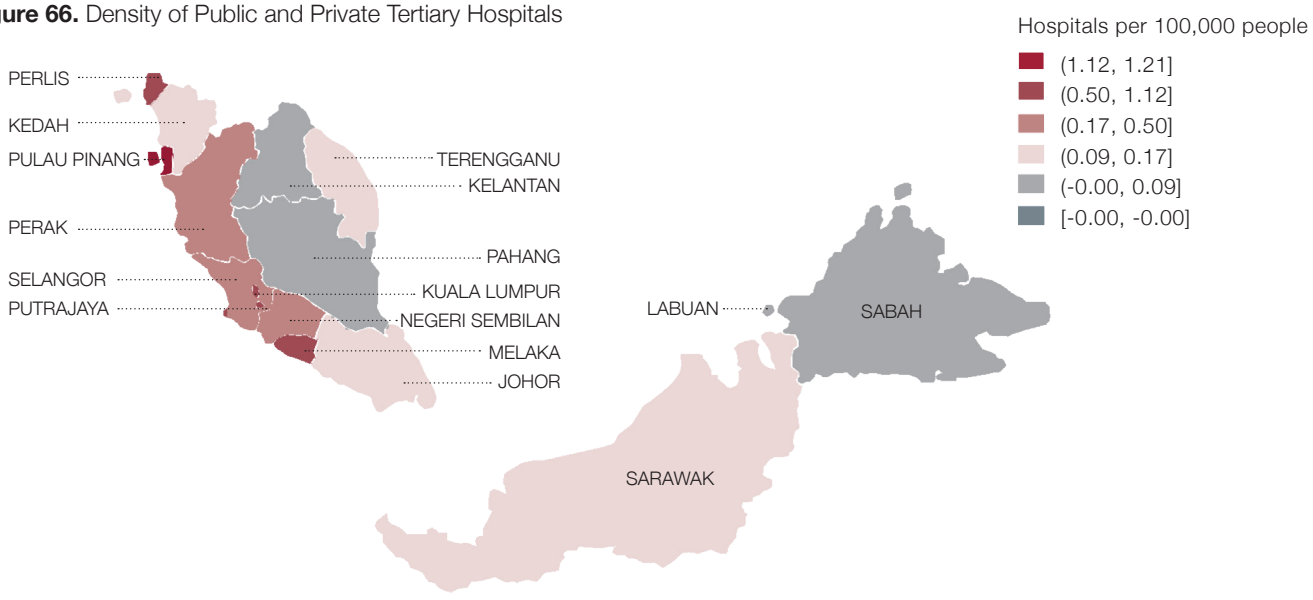


Data source: MoH HIC (June 2014), CKAPS (June 2015)
Excludes dialysis chairs, ambulatory center, nursing home, rehabilitation, psychiatric, hospice, and other long stay hospital beds
Outlier WP Putrajaya (6.7 public beds per 1,000) excluded

ratio of private to public beds. The remaining states have fewer beds per 1,000 population than the national average and higher ratios of public sector to private sector beds (Figure 65) [23].

Tertiary hospitals, including both public and private hospitals, are concentrated in the west coast states of Peninsular Malaysia, which have high population density (Figure 66) [23].

Figure 66. Density of Public and Private Tertiary Hospitals



Data source: NHEWS (2013); Responding hospitals only

Ministry of Health hospitals host 948 clinical specialty or sub-specialty departments, representing 46 different specialties or sub-specialties (Figure 67). For the core specialties—such as general medicine, emergency medicine, pediatrics, anesthesiology, orthopedics, and obstetrics and gynecology—coverage is geographically extensive, with all regions having multiple hospitals with such specialties. This contrasts with other specialties or sub-specialties—such as burns, pediatric intensive care, child psychiatry, dental specialties, and colorectal surgery—where substantial gaps in service provision exist.

Among the six regions of Malaysia, as defined by the 10th Malaysia Plan, the Northern Region, followed by the Central Region, are best endowed with specialty and sub-specialty departments, with 242 and 225 such departments per region, respectively, in sharp contrast to Sabah and Sarawak, with only 93 and 92 such departments, respectively (Figure 67). Comprehensive information on the scope of services offered in the private sector is not available at time of report writing [23].

Figure 67. MOH Hospital Specialties, by Region

Hospital Specialty	Northern Region	Central Region	Eastern Region	Southern Region	Sabah and Labuan	Sarawak	MALAYSIA
Trauma & Burns	1	1	0	1	0	1	4
Pediatric Intensive Care	2	1	0	1	0	1	5
Child Psychiatry	1	1	1	1	0	1	5
Colorectal Surgery	2	1	2	1	0	0	6
Glaucoma	2	1	2	1	0	0	6
Pediatric Surgery	3	1	2	1	0	0	7
Spinal Surgery	1	1	2	1	1	1	7
Sports Medicine	1	3	1	1	1	0	7
Neurosurgery	3	1	1	1	1	1	8
Urology	2	1	2	1	2	1	9
Arthroplasty	4	1	1	1	1	1	9
Rheumatology	2	3	2	1	1	1	10
Cardiology	3	1	3	1	1	1	10
Gyne-Onco	4	2	3	0	0	1	10
Vitero-Retinal	4	2	2	0	1	1	10
Gastroenterology	3	1	3	2	1	1	11
Endocrinology	3	3	2	1	1	1	11
Plastic Surgery	3	1	2	2	2	1	11
Chemical Pathology	4	3	2	1	1	1	12
Transfusion Medicine	4	2	2	2	1	1	12
Rehabilitation Medicine	3	3	3	1	1	1	12
Respiratory Medicine	6	1	3	1	1	1	13
Maternal Fetal Medicine	4	4	3	1	0	1	13
Forensics Medicine	3	3	3	2	1	1	13
Infectious Medicine	4	3	3	2	1	1	14
Hematology	4	3	3	2	1	1	14
Microbiology	4	3	3	2	1	1	14
Anatomy Pathology	4	3	3	2	1	1	14
Adult Intensive Care	3	3	3	2	2	1	14
Dermatology	4	8	1	2	1	1	17
Neontology	4	8	3	3	0	1	19
Pathology	4	7	4	2	2	1	20
Nephrology	6	5	4	3	1	2	21
Pediatric Dentistry	6	9	4	3	1	2	25
Oral Surgery	7	9	5	5	3	3	32
Otorhinolaryngology	9	10	6	5	3	3	36
Ophthalmology	10	9	6	5	5	5	40
Psychiatry	11	11	9	7	4	4	46
Radiology	11	10	7	6	7	6	47
Orthopedics	12	11	7	7	5	6	48
Obstetric & Gynecology	11	12	9	7	4	5	48
General Surgery	11	11	8	7	7	6	50
Pediatrics	12	12	8	7	5	6	50
Anesthesiology	12	12	8	7	7	5	51
Emergency Medicine	12	12	9	7	7	4	51
General Medicine	13	12	10	7	7	7	56
Regional Total	**242**	**225**	**170**	**126**	**93**	**92**	**948**

Data Source: Medical Development Division (2014)

◆ No specialist units within the region
▲ One or two specialist units within the region
● Three of more specialist units within the region

Table 9. Ambulatory-Care Sensitive Conditions at MOH and Private Hospitals

Sector	Type of Hospital	Atun[1] (percent)	NHS [62] (percent)
MOH *(excl. day case)* *N=1,769,777*	Non-specialist hospital	20.8	23.5
	Minor specialist hospital	17.2	19.5
	State hospital	12.7	14.9
	Major specialist hospital	12.9	14.4
	Special medical institution	9.9	8.8
	All MOH Hospitals	14.6	16.7
Private[2] *N=869,801*	Private Single Speciality Hospital	38.1	41.7
	Private Secondary Hospital	17.3	19.5
	Private Tertiary Hospital	16.5	19.5
	Private Hospital (Other)	6.7	8.7
	All Private Hospitals	17.3	20.1

Data Source: SMRP (2013); HIMS Private Hospital Subsystem (2013); Health Facilities (2014)

[1]Source of definition: personal correspondence.

[2]For private hospitals, there are about 1 million inpatient admissions, but only around 90 percent can be matched to a private hospital in the 2014 Health Facilities dataset. Private maternity homes and hospices are excluded

Although public hospitals provide a wide range of specialties, analysis of inpatient discharges indicate that 14.6 percent of inpatient discharges at public hospitals are for ambulatory care-sensitive conditions (Table 9), which are defined as conditions where strong outpatient care could have prevented the need for admission. In non-specialist hospitals, more than a fifth of discharges are for ambulatory care-sensitive conditions, but in state and major specialist hospitals 12–13 percent of discharges are for such conditions. The proportion of ambulatory care-sensitive conditions admitted to private hospitals is higher than that for public hospitals (17.3 percent of total admissions) [23].

5.2.4. Oral Health

In Malaysia, oral health status has improved steadily and substantially for school-age children, but the progress among pre-school children and among adults has been less remarkable, with high rates of untreated caries [49].

Access

For both adults and children, there is extensive access to dental care services, with few financial barriers, especially in the government system—where services are available with low user fees, but also in the private sector. With regard to physical access, there is good access to dental care clinics for the population. The most recent survey data indicate that the average travel time to a source of dental care in Malaysia among those receiving dental care within the past two years is 19 minutes (Table 10). Furthermore, geographic information system analysis indicates that 82 percent of Malaysians reside within 30 minutes of a dental clinic [49].

Table 10. Key Dental Health Indicators

	% adults with a dental checkup within...		% adults in need of restorative dental care	Mean travel time to dental facility (minutes)	Mean DMFT score	Dentists per 10,000 population	% dentists in private sector
	Past Year	Past 2-Years					
Urban	31.6%	46.8%	35.0%	16.1	10.9	N/A	N/A
Rural	21.6%	35.6%	41.7%	25.1	12.7	N/A	N/A
Malaysia	27.4%	42.0%	37.7%	19.3	11.7	1.96	32.5%

Data Source: National Oral Health Survey of Adults (2010); N/A=not available

Utilization

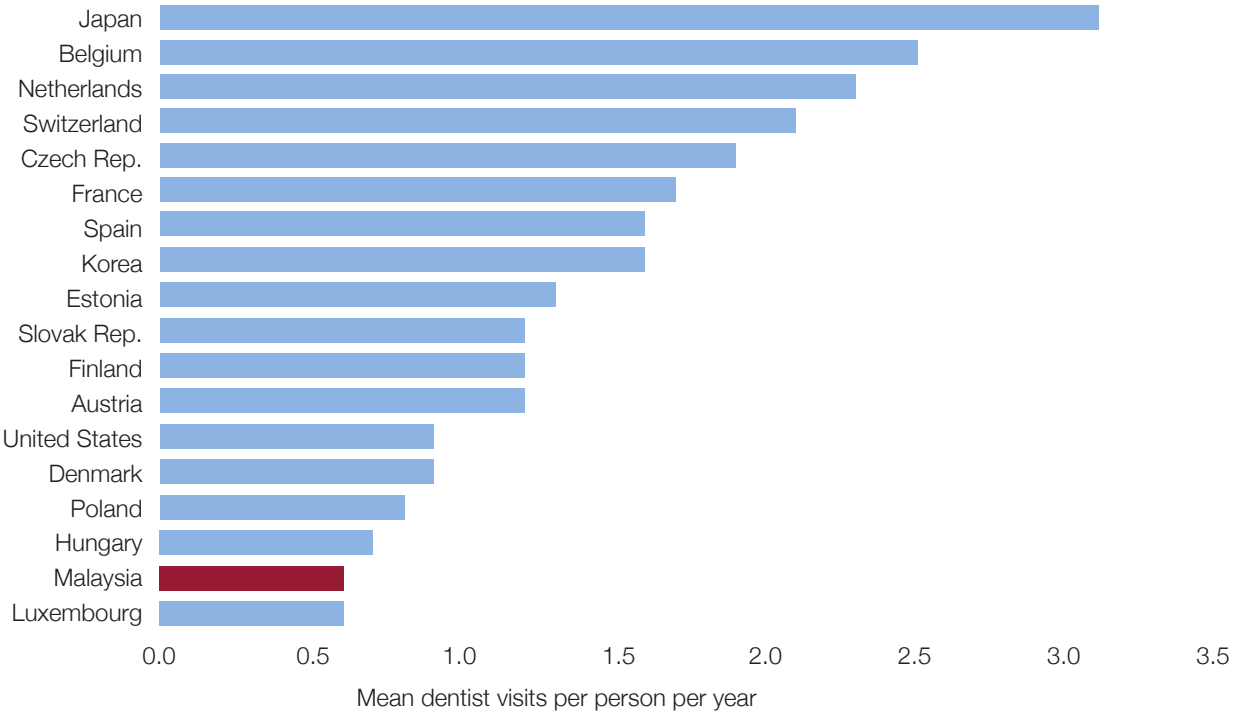
Coverage for children through school-based programs has increased substantially in recent years and is close to universal. Dental care coverage for pregnant women, which is a priority group for the Ministry of Health, has increased from 26 percent of pregnant women receiving a dental exam in 2009 to 38 percent in 2014. However, utilization is low for adults and is increasing slowly; the percent of adults with a dental clinic visit within the past 24 months increased only marginally between 2000 and 2010 from 40.5 percent to 42.0 percent [49].

There is a significant gradient in dental care utilization with respect to age, with older age groups in general having lower utilization rates. Dental care utilization rates are also lower in rural areas (22 percent of adults with a dental visit in the past year) compared to urban areas (32 percent) and among low-income adults (18 percent) compared to high-income adults (39 percent). Compared with OECD countries, dental care utilization rates in Malaysia are relatively low (Figure 68) [49].

A large proportion of dental visits arise from acute problems, suggesting that adults in Malaysia do not view dental care as a regular, routine, and primarily preventive healthcare service. There are also challenges with oral health literacy among the adult population. Taken together, the analysis suggests that the key reasons behind low, stagnant dental care utilization rates among adults relate to the perceived value of routine dental care and not the availability of providers or financial barriers [49].

According to the most recent Malaysian National Health Accounts data, oral healthcare spending accounts for 2.6 percent of total health spending—a level that has been stable for the past decade [25]. Across all OECD countries, spending on dental care, on average, accounts for 5.2 percent of total health spending. Oral health care accounts for about three percent of total Ministry of Health spending in Malaysia, and, 52 percent of total dental care spending is from private sources—a proportion that has been stable over the past decade [49].

Figure 68. Dental Visits, Malaysia and Selected OECD Countries



Data Sources: OECD (2014) and National Oral Health Survey of Adults (2010) and World Bank

5.2.5. Human Resources for Health

Density and Distribution

Human resource densities for all health cadres have been increasing since 2002, with a 2.1 fold increase for doctors and a 2.2 fold increase for nurses. However, in spite of the rising numbers, the number of doctors and nurses per 1,000 population is lower than the levels observed in OECD countries [63]. Current human resource densities for the main cadres of health workers are shown in Table 11.

The distribution of doctors per capita is geographically uneven, with Sabah, Sarawak, and Kelantan relatively underserved by the health workforce, especially compared with the urban centers in the west coast of Peninsular Malaysia (Figure 69) [63].

Preliminary analysis does not indicate a significant gap between the supply and demand for doctors, but analysis based on updated data is ongoing. Future human resource needs will be predicated on the scale and scope of services to be offered in the planned service delivery model, including services such as health promotion, disease prevention, and interventions to influence demand for early diagnosis and effective management of chronic illness. As such, further analysis is required to more precisely estimate the appropriate size and skill mix of the future health workforce in Malaysia [63].

Table 11. Total and Population Ratios for Doctors, Dentists, Nurses, Pharmacists, and Assistant Medical Officers, 2014

	Total Public (MOH and non-MOH)	Total Private	Total Public and Private	Public and Private per 1,000 population
Doctors	39,545	12,290	51,835	1.72
Dentists	4,297	2,125	6,422	0.20
Nurses	69,332	28,333	97,665	3.15
Pharmacists	7,415	5,177	12,592	0.41
Assistant Medical Officers	11,775	998	12,773	0.41

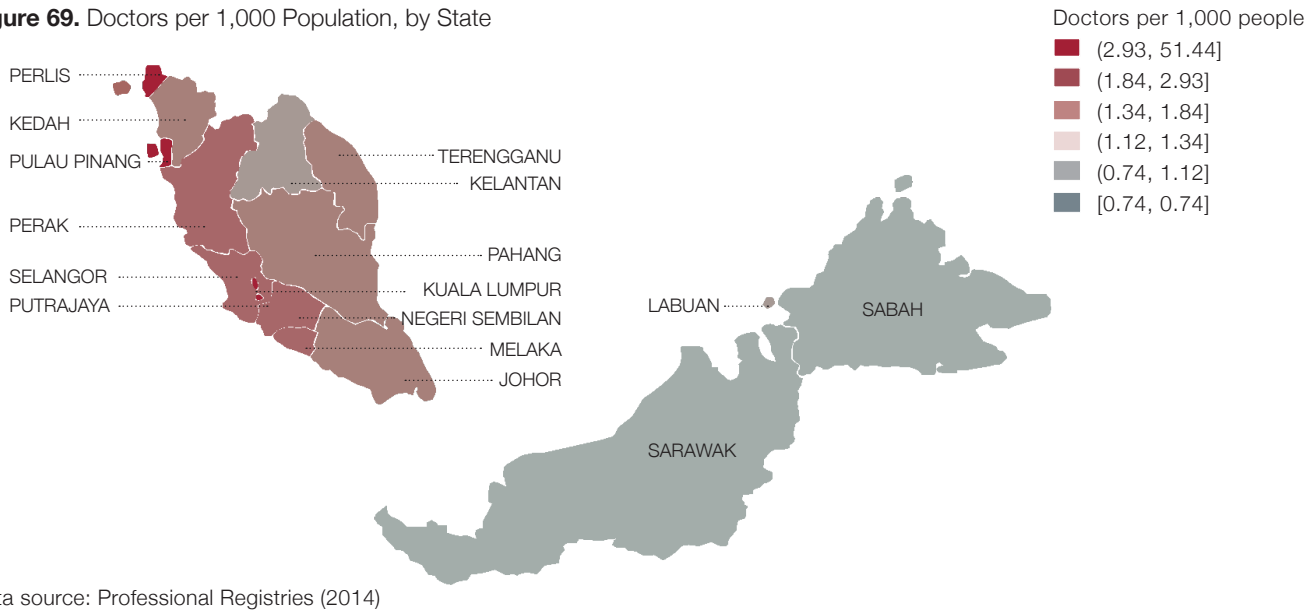
Data Source: Ministry of Health Human Resources Division, HRMIS, Health Facts (2014)

Training and Education

The pre-service education and specialty training for health professionals in Malaysia involves multiple institutions including the Ministry of Health, the Ministry of Higher Education, the Malaysian Qualifications Agency (MQA), and professional councils or boards including the Malaysian Medical Council.

Medical doctors in Malaysia must complete five years of undergraduate medical training, followed by a two-year 'housemanship' at a government healthcare facility (although recently announced reforms to fast track excellent performers are noted) [64]. There is also a compulsory service requirement that doctors must serve an additional two years in the Ministry of Health following their full registration. After completing the housemanship, doctors can choose to continue as Medical Officers (generalists) or to specialize by completing a master's degree or equivalent followed by in-service training.

Figure 69. Doctors per 1,000 Population, by State



Data source: Professional Registries (2014)

The number of medical graduates has been increasing in recent years. This trend is driven in part by an increase in the number of private institutions offering medical training and an increase in the number of graduates from foreign medical schools. There has also been an increase in the numbers of doctors graduating from post-graduate (specialist) programs at Malaysian public universities: the number of specialist graduates increased from 319 in 2008 to 564 in 2013, although the number fell slightly in 2014 to 504 [65].

Due to the housemanship and compulsory service requirements, the increase in medical graduates has a direct impact on the number of newly-trained doctors entering the public sector. This has placed strain on the capacity of government facilities to provide training, and has made it difficult for public facilities to stay within the limit of one trainee per four hospital beds, especially because a significant proportion of housemen take more than two years to finish their training [65, 66]. Clinical preceptors, generally senior doctors, report being overburdened by an excessive number of trainees. Furthermore, sharp increases in the number of medical graduates contributes to a situation in which demand for posts may exceed number of available positions in the public sector, particularly for inexperienced doctors. To address these challenges, which are mirrored in other health cadres such as nurses and dentists, there have been a number of moratoriums on the number of healthcare professionals entering into different health care professional schools [49, 63].

While the number of medical graduates exceeds the supply of training positions, the number of 'specialist' doctors is limited. For example, as of 2015, there were only 281 family medicine specialists (including those undergoing the six-month period of service required to be gazetted) in 242 MOH health clinics. Less than 10 percent of the 2,871 MOH health clinics have a family medicine specialist.

5.2.6. Health Information Systems

Malaysian society is highly literate in the use of information technology (IT), with high broadband penetration rates and social media engagement. However, despite several past initiatives such as Tele-Primary Care (TPC, a primary health care Electronic Medical Records system), the health sector has lagged behind and the Health Information System (HeIS) shows great opportunity for improvement. The slow uptake of health information technology has been recognized by central agencies and MOH, and various initiatives (which are ongoing or have recently been announced as part of the 11th Malaysia Plan) are expected to transform the technological platforms and the content of the HeIS in the coming years [67].

Among MOH facilities, there are currently 89 TPC sites, 12 Oral Health Clinical Information System sites, and 21 MOH hospitals which have implemented Hospital Information Systems (HoIS) or Electronic Medical Records (EMRs) to varying degrees, although different systems are being used by different hospitals. These facilities represent a small share of the 142 MOH hospitals, 1,061 MOH health clinics, and 1,810 MOH community clinics across the country. In the private sector, very little information is available about the data systems used, although the National Medical Care Survey (NMCS) of 2014

finds that 72 percent of private GPs nationwide use EMRs [67].

Key findings from analysis of the importance, data quality, and technological quality of health-related datasets indicate that there is fragmentation across datasets which have similar functions (for example, multiple types of non-interoperable hospital information systems and multiple platforms for disease registries), variations in the quality of data systems, and a general lack of information from the private sector [67].

Analysis was also conducted to describe and suggest further linkages and relationships between health-specific and non-health-specific (for example, national registration) datasets (see Table 12). Two important ongoing initiatives—the Health Information Exchange (MyHIX) and the Health Data Warehouse (MyHDW)—will provide additional linkages across datasets as well as linkages related to patient records. However, there are further opportunities to ensure that linkages are bidirectional, and relate to and inform supply-side datasets, non-health sector datasets which are relevant to health, and the private sector [67].

Routinely used health system indicators in Malaysia were also described and compared with internationally adopted health indicators such as the WHO Core Health Indicators, European Community Health Indicators (ECHI), and OECD Health Indicators. Key findings of the analysis are that although Malaysia generates an extensive number of indicators (109 tables of indicators were reported), these cover few policy areas (with gaps in non-medical determinants of health, equity, quality, pharmaceuticals, and long-term care-related indicators), lack non-MOH or private sector information, and reflect the institutional and programmatic structure of the MOH rather than the needs of individuals using the health system. With the exception of mortality-related indicators, which were comparable with internationally-used indicators, routinely-generated health system indicators in Malaysia are generally defined to capture process data reflecting administrative inputs and outputs of the MOH—for example, numbers of discharges for patients with a diagnosis of cancer—rather than more meaningful population-based measures such as cancer incidence, accessibility of services, and treatment outcomes of cancer patients [67].

In summary, the HeIS in the Malaysian government health system has been developed for a very specific organizational context—namely, the management of a highly-centralized government health delivery system, and for a specific epidemiological context—focusing on maternal and child health and communicable diseases. However, the HeIS has been slow to evolve, with stepwise adaptations mainly in the form of upgrades to technologies underpinning the data collection and aggregation activities. Indicators reflect the output of facilities and programs rather than the population-level health context. Furthermore, institutional silos within the MOH hamper the free flow of information across programs, divisions, units, and research institutes, and make it exceedingly difficult for policymakers to have a full picture of the state of the health system. Investment in analytic capacity has been limited, and as a result analytic capacity is not at the level that would be needed in order to effectively leverage the HeIS to inform evidence-based policymaking and evaluation in real time [67].

Table 12. Matrix of Health Dataset Linakges

Legend

<<<	Direction of **existing** data flow
<<	Suggest **new** data flow
J	Suggest to **join** datasets
L	Suggest to **link** datasets
DL	Suggest to **link** datasets (depersonalized)
X	Link not appropriate/required
O	Link appropriate but current system is being replaced as it is **obsolete**
<	**Direction** of flow for new links
INT	**Internal** linkage / joins

	PATIENT RECORDS	TPC and OHCIS	HeIS	HEALTH DATA PLATFORMS	MyHIX	SMRP	Case-mix database	e-Reporting	*e-HIMS*	*MyHDW*	DISEASE-SPECIFIC	e-Notifikasi	Various disease registries	*PRIS*	POPULATION	DoSM Population Census	Household and Health Surveys	SUPPLY-SIDE	Government administrative databases	Health Facility Registry	Pharmaceutical Information System (PHIS)	MoH KPI and Quality Indicators	FINANCING and REGULATORY	MoH Financial System	MNHA	Professional Registries	Private Healthcare Act databases	COVERAGE	JPN and CRVS	e-kasih	SOCSO	JPA	SPIKPA	FOMEMA	Other private health coverage schemes
1. PATIENT RECORDS																																			
1a. Primary Care EMRs (TPC and OHCIS)		INT	<L>		<L>	O	O	X	<L>	<DL		<L>	O	<L>		X	X		X	<<	X	X		X	X	X	X		X	<<	<<	<<	X	<<	<<
1b. Hospital Information Systems (HeIS)		<L>	INT		<L>	O	O	X	<L>	<DL		<L>	O	<L>		X	X		<<	<<	<<	<<		X	X	<L>	X		X	<<	<<	<<<	<<<	<<	<<
2. HEALTH DATA PLATFORMS																																			
2a. Health Information Exchange (MyHIX)		<L>	<L>			O	O	O	<L>	<DL>		<L>	O	<L>		X	X		X	<<	X	X		X	X	<<	<<		<L>	<L>	<L>	<L>	<L>	<<	<L>
2b. SMRP		O	<<<		O		J	O	*O*	*X*		O	O	*O*		O	O		X	O	X	X		X	X	X	X		X	X	X	X	X	X	X
2c. Case-mix database		X	O		X	J		X	*O*	*X*		O	O	*O*		O	O		X	O	X	X		X	X	X	X		X	X	X	X	X	X	X
2d. e-Reporting		<<<	O		O	O	O		*O*	*O*		O	O	*O*		X	X		X	O	X	O		X	X	X	X		X	X	X	X	X	X	X
2e. e-HIMS (as planned)		<L>	<L>		<L>	*O*	*O*	*O*	*INT*	<L>		*J*	*O*	<L>		*X*	*X*		<<	<<	*X*	*X*		*X*	*X*	<<	<<		<<	<<	<<	<<	<<	<<	<<
2f. MyHDW (as planned)		<DL>	<DL>		<DL>	*O*	*O*	*O*	<L>	*INT*		<<	<<	<<		<<	<<		<<	<<	<<	*J*		<<	<<	<<	<<		<<	<<	*X*	<<	<<	<<	*X*
3. DISEASE-SPECIFIC																																			
3a. e-Notifikasi		<<<	<<<		<L>	O	O	O	*J*	*X*			X	<L>		X	X		X	<<	X	X		X	X	X	X		X	X	X	X	X	<<	X
3b. Various disease registries		O	<<<		O	O	O	X	*O*	*X*		X	INT	*O*		X	X		X	O	X	X		X	X	X	X		X	X	X	X	X	X	X
3c. Patient Registry IS (PRIS) (as planned)		<<	<<		<L>	*O*	*O*	*O*	<L>	*X*		<L>	*O*	*INT*		*X*	*X*		*X*	<<	*X*	*X*		*X*	*X*	*X*	<<		*X*	*X*	*X*	*X*	*X*	<<	*X*
4. POPULATION																																			
4a. DoSM Population Census		X	X		X	X	X	X	*X*	*X*		X	X	*X*			X		X	X	X	X		X	X	X	X		X	X	X	X	X	X	X
4b. Household and Health Surveys		X	X		X	X	X	X	*X*	<<		X	X	*X*		<<<			X	<<	X	X		X	X	X	X		X	<<	X	X	X	X	X
5. SUPPLY-SIDE																																			
5a. Government administrative databases		X	X		<DL	X	X	X	<DL	<DL		X	X	<DL		<<	<<			<L>	<<	<<		<<	<<	<<	X		X	<<	X	<DL	<DL	<DL	<DL
5b. Health Facility Registry		X	X		<L>	O	O	X	*X*	<DL		X	X	*X*		<<	<<		<L>		<L>	<L>		<<	X	<<	<L>		X	X	X	X	X	X	X
5c. Pharmaceutical Information System (PHIS)		<DL	<<<		X	X	O	X	*X*	<DL		X	X	*X*		X	X		X	<L>		X		<<	X	X	<L>		X	X	X	X	X	X	X
5d. MoH KPI and Quality Indicators		<DL	<<<		<<	O	O	O	*X*	*J*		<<	<<<	<DL		X	<<		X	<L>	<<	INT		<<	X	X	<<		X	X	X	X	X	X	X
6. FINANCING and REGULATORY																																			
6a. MoH Financial System		<DL	<<<		X	X	X	O	*X*	<DL		X	X	*X*		<<	<<		<<	<L>	<<	X			X	X	X		X	<<	X	X	<<	X	X
6b. MNHA		X	X		X	X	X	O	*X*	<DL		X	X	*X*		<<	<<		<<	<<	<<	X		<<		X	X		X	X	<DL	<DL	<DL	X	<DL
6c. Professional Registries		X	X		X	X	X	X	*X*	*X*		X	X	*X*		X	X		X	<<	X	X		X	X	INT	<L>		X	X	X	X	X	X	X
6d. Private Healthcare Act databases		X	X		X	X	X	O	*X*	<DL		X	X	*X*		X	X		X	<L>	<L>	X		X	X	<L>	INT		X	X	X	X	X	X	<L>
7. COVERAGE																																			
7a. National Registration (JPN) and CRVS		X	<<<		<L>	X	X	X	*X*	*X*		X	X	*X*		X	X		X	X	X	X		X	X	X	X								
7b. ICU e-kasih poverty/welfare databases		X	X		<L>	X	X	X	<<	*X*		X	X	*X*		<<	<<		X	X	X	X		X	X	X	X								
7c. Social Security Organization (SOCSO)		X	X		<L>	X	X	X	*X*	*X*		X	X	*X*		X	X		X	X	X	X		X	X	X	X								
7d. Civil Servants Pensions and Salaries (JPA)		X	X		<L>	X	X	X	*X*	*X*		X	X	*X*		X	X		X	X	X	X		X	X	X	X								
7e. SPIKPA		X	<<		<L>	X	X	X	*X*	*X*		X	X	*X*		X	X		X	<<	X	X		X	X	X	X								
7f. FOMEMA		X	X		X	X	X	X	*X*	*X*		X	X	*X*		X	X		X	<<	X	X		X	X	X	X								
7g. Other private health coverage schemes		X	X		<L>	X	X	X	*X*	*X*		X	X	*X*		X	X		X	<<	X	X		X	X	X	<L>								

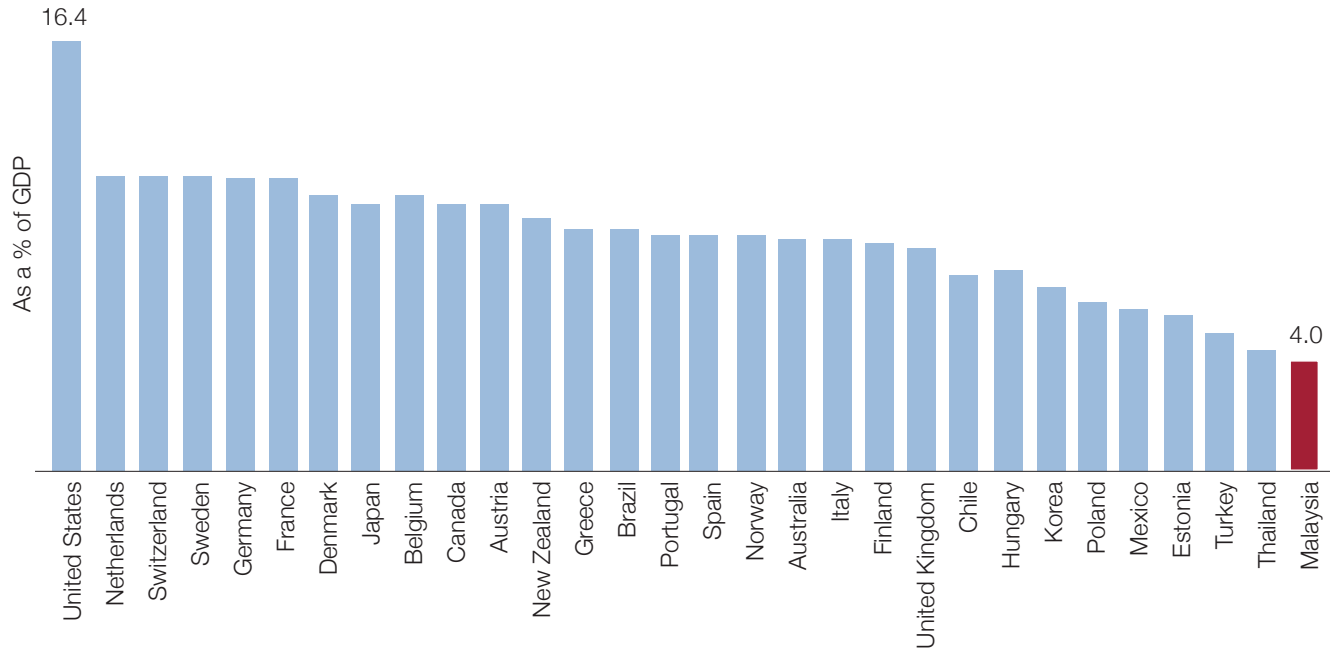
Five major changes are needed, among others, in order to build a health information system that can provide comprehensive, timely, and relevant information on health determinants at an individual level (and not just population level averages), inputs and outputs of the health system, and health outcomes. First, the institutional and structural impediments to greater interoperability of information systems and reduced fragmentation of datasets within the health system and beyond require attention beyond technological and financial resource considerations. Second, there is a need to rationalize the existing datasets to reflect evolving priorities and context, and where possible to align them with internationally-adopted indicators to enable comparability. Third, there is a need to develop and cultivate analytic capacity to provide timely analysis, information, and intelligence to policymakers and practitioners. Fourth, an enabling institutional environment is needed to create demand for analysis and intelligence to inform policy and practice. Fifth, to reduce fragmentation and to improve data availability, there needs to be bi-directional engagement with the private sector [67].

5.3. Financing

5.3.1. Health Expenditure Trends and Financing Patterns

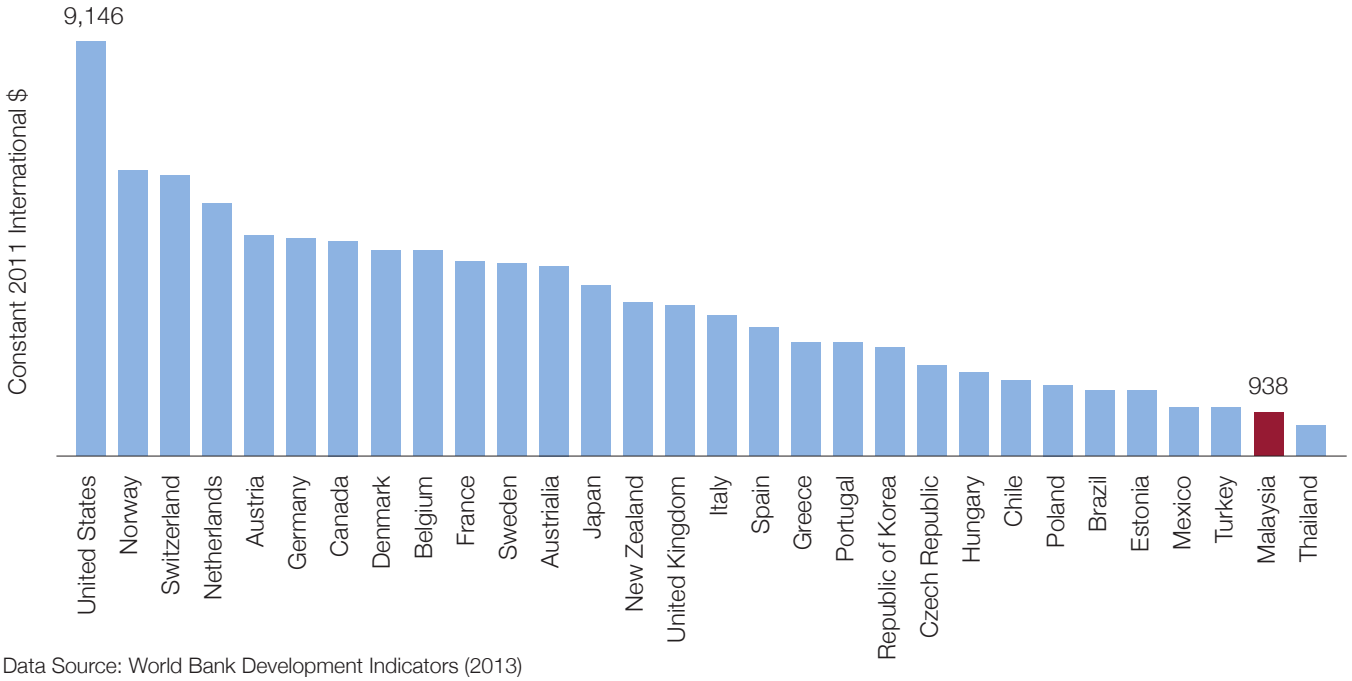
In 2013, Malaysia spent 4.0 percent of its GDP on health, a share which has risen from 2.7 percent in 1997. Nonetheless, Malaysia's health spending is still low as a proportion of GDP. Malaysia spends a lower share of GDP on health than any OECD country, and a lower share than Brazil and neighboring

Figure 70. Total Health Expenditure as a Share of GDP, Malaysia and Selected OECD Countries, 2013 or latest year



Data source: OECD, World Bank World Development Indicators (Thailand) and Malaysian National Health Accounts (SHA 2013)

Figure 71. Health Expenditure per Person, PPP for Malaysia and Selected OECD Countries, 2013



Data Source: World Bank Development Indicators (2013)

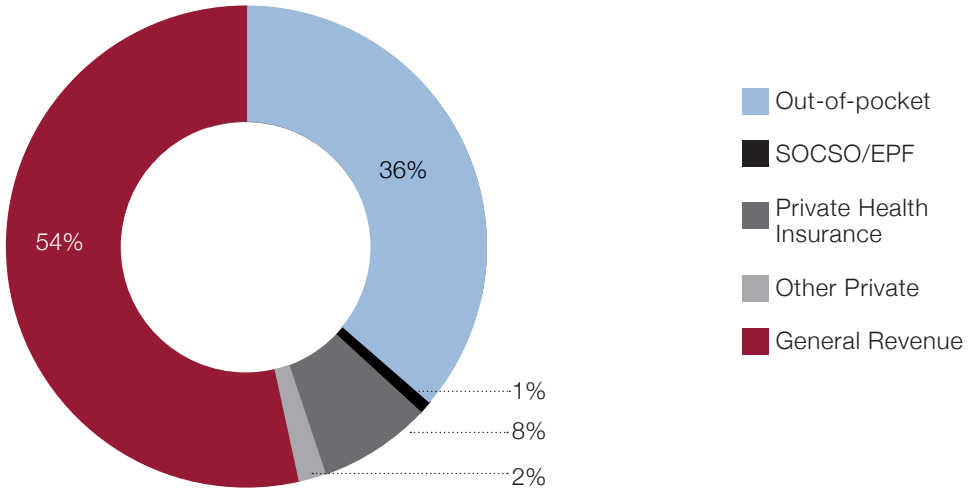
Thailand (Figure 70). Real per person spending on health has also increased by 128 percent between 1997 and 2013 from RM 584 to RM 1,330 (Figure 62 in Section 4.2), but is still low by international comparison [37]. Malaysia's strong economic growth has allowed it to substantially increase spending on health while maintaining a lower overall burden of health spending, both as a share of GDP and in absolute terms [37].

The health system in Malaysia is financed in nearly equal part by public and private spending. In 2013, the government financed 54 percent of health expenditures through general revenues, according to National Health Accounts data using the SHA framework [25]. About eight percent of all health spending was financed through private health insurance, while one percent was financed by the Social Security Organization (SOCSO) and Employees Provident Fund (EPF). The remaining two percent of financing came from non-governmental organizations, corporations, and other sources (Figure 72) [25].

Out-of-pocket spending is 1.44 percent of GDP [25]. However, as a proportion of total health expenditures, out-of-pocket expenditures are relatively high, at approximately 36 percent of total expenditures. While many other middle-income countries—including Brazil, Mexico, Thailand, and Turkey have reduced out-of-pocket spending as a proportion total health expenditures through health financing reforms, out-of-pocket financing in Malaysia has marginally increased between 2000 and 2013 (Figure 73) [37].

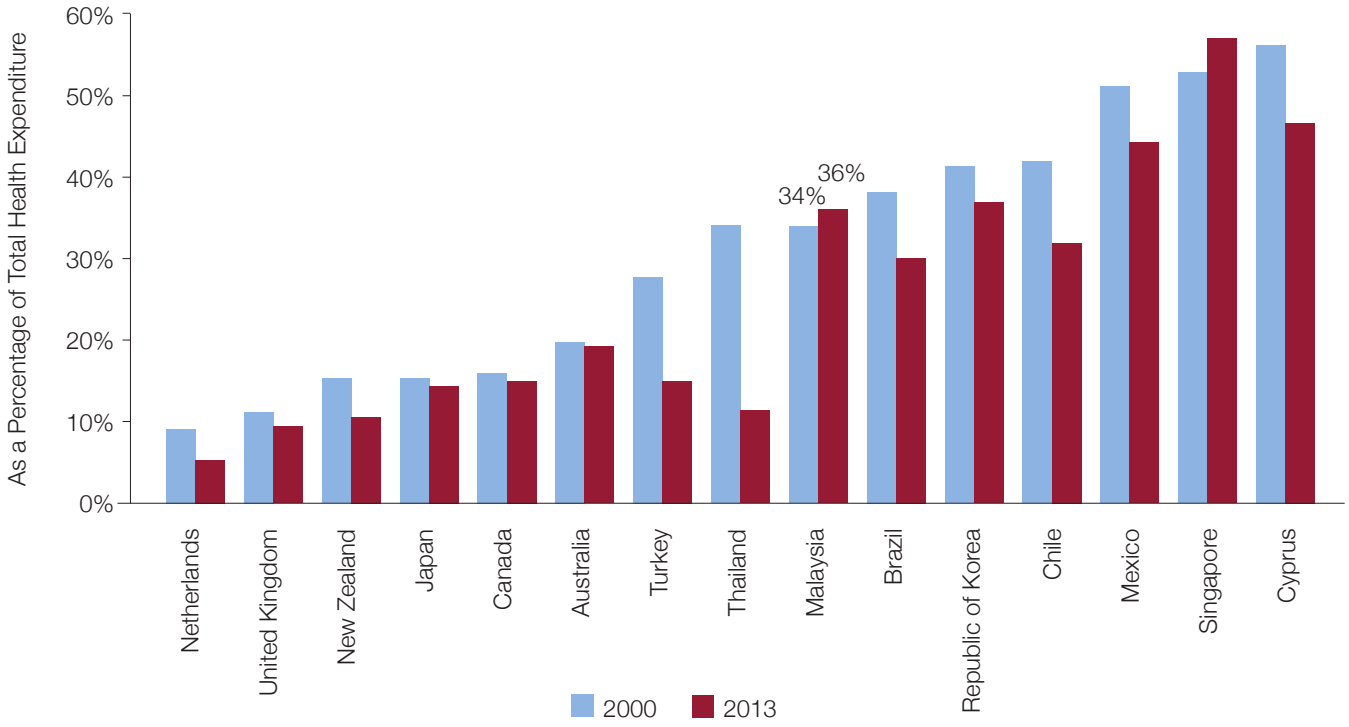
Out-of-pocket spending on health is considered a suboptimal way to finance healthcare because unpooled expenditures do not allow for economies

Figure 72. Sources of Health Expenditures in Malaysia, 2013



Data Source: Malaysian National Health Accounts (System of Health Accounts Framework, 2013)

Figure 73. Out-of-Pocket Expenditures as a Share of Total Health Expenditures, Malaysia and Selected OECD and Other Countries, 2000 & 2013



Data Source: Malaysian National Health Accounts (System of Health Accounts Framework, 2013) and OECD

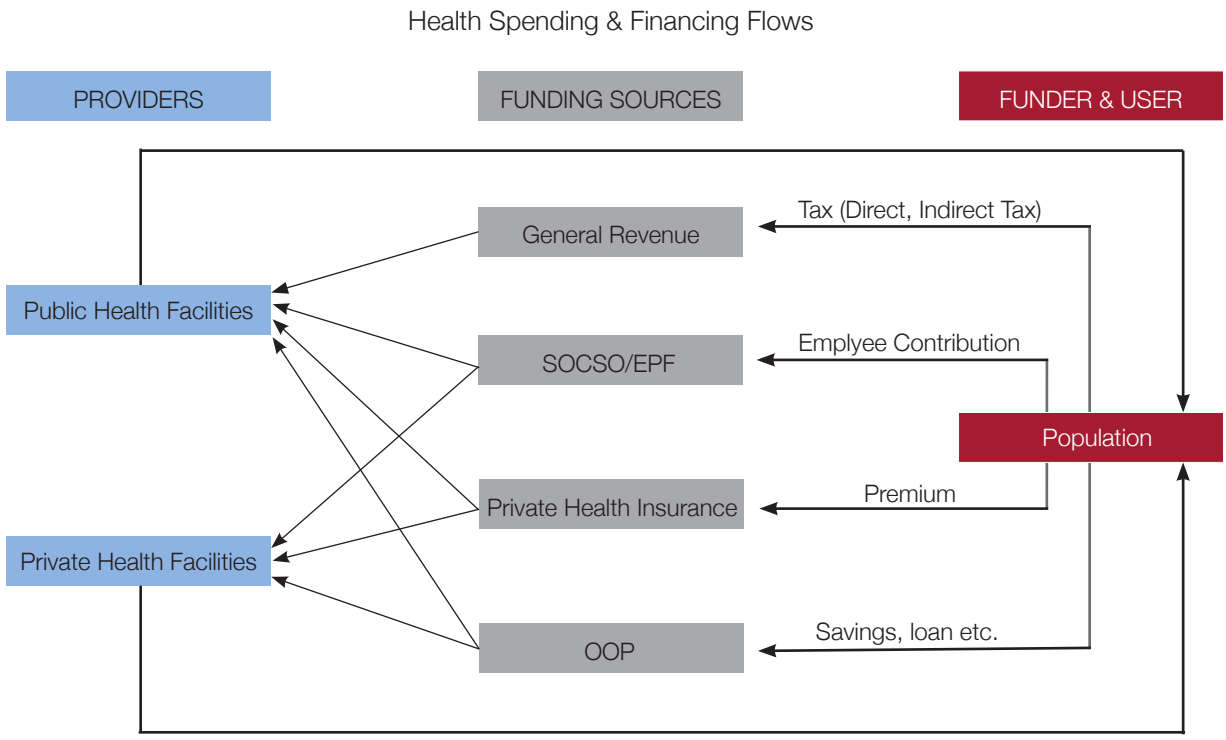
made possible through bulk purchase of services, negotiation of discounts, or payment mechanisms linked to outcomes. Out-of-pocket payments also increase financial risk for individuals because they do not facilitate consumption smoothing or redistribution across population groups. In most OECD countries, out-of-pocket payments are kept low through reliance on pooled funds for financing health expenses—primarily social insurance or government budgetary allocations [37].

Malaysia has achieved relatively good value in terms of health outcomes for its level of health spending, as well as strong financial protection against ill health, despite the high share of out-of-pocket expenditures (Sections 2.3 and 3.3). However, the continued reliance on out-of-pocketing spending suggests that increasing financial pooling could further strengthen the Malaysian health system. Financial pooling would also enhance financial risk protection. Making this transition is especially critical given that long-term trends suggest that Malaysia's health spending will rise as a proportion of GDP, as discussed in Section 4.2.

5.3.2. Funding Flows and Budget Allocation

Figure 74 illustrates the flow of funds and services in the Malaysian health system. Public services are primarily financed by general government revenue, through the Ministry of Health, Ministry of Higher Education, Ministry of Defense, and other national, state, and local agencies. Public facilities also receive revenues from SOCSO and EPF, private health insurers, and individuals. Private providers, mean-

Figure 74. Health Spending and Financing Flows



while, receive funding from SOCSO, EPF, private insurers, and individual patients [37].

Public financing for health care represents about 10 percent of total government expenditures, according to the Ministry of Finance [37]. Public health expenditures are channeled predominantly through the Ministry of Health. Each year, the Ministry of Health, with input from the State Health Departments, proposes a budget for the subsequent year to the Ministry of Finance and the Cabinet for review and approval, based on earlier expenditures, budget growth trends, and feedback from lower-level budget holders (state health departments, district health offices, and hospitals). The Ministry of Finance allocates a total budget to the Ministry of Health based on review of historical expenditure and new policies approved under the Malaysia Plans [7].

The Ministry of Health budget is divided among the various programs within the Ministry of Health—Medical, Public Health, Management, Research and Technical Support, Oral Health, Pharmaceutical Services, Food Safety and Quality, and the Malaysia Health Promotion Board—as well as to one-off projects and new policies. In 2014, the medical budget accounted for 63 percent of the total budget. These divisions then allocate the budget to states according to their programs. The state health departments in turn allocate to various 'responsibility centers', including hospitals, district health offices (which manage public health activities and primary care clinics), district dental offices, and pharmacies, using line-item budgeting [7].

Funding for the private sector comes from multiple sources. In 2012, private hospitals and clinics received about two-thirds of their revenues as direct out-of-pocket payments from patients. Private health insurance represented 20 percent of revenues for hospitals and nine percent for clinics, while the remainder came from a mix of employers, government agencies, SOCSO, and other sources (see section 5.4.2 for further detail) [7].

5.3.3. Equity in Financing and Benefit Incidence Analysis

Analysis is currently underway by the Harvard and Malaysian Teams to assess how financing for health care as well as healthcare services are distributed across the Malaysian population. There are two components to this study: an analysis of who benefits from services financed by public subsidies, social insurance, private insurance, and out-of-pocket payments (benefit incidence analysis), and an analysis of who finances the health system through tax payments, insurance premiums, out-of-pocket payments, and social security contributions. Findings of both analyses will be reported when the study is complete.

An earlier study, the Malaysia Health Care Demand Analysis, conducted a benefit incidence analysis using data from 2009 [24]. The study found that the distribution of public health expenditures in Malaysia is pro-poor, with expenditures relatively evenly distributed across the lower four socioeconomic quintiles, and less concentrated in the richest quintile. This distribution was one of the most pro-poor in the Asia-Pacific region. Conversely, private expenditures were pro-rich, primarily benefiting those individuals

who could pay for private care. Combining both public and private expenditures, the overall distribution of expenditures was pro-rich. While 11 percent of health expenditures were used to finance services for the poorest quintile, 28 percent of expenditures financed services for the richest quintile. Figure 75 shows the distribution of both public and private expenditures in 2009 [24].

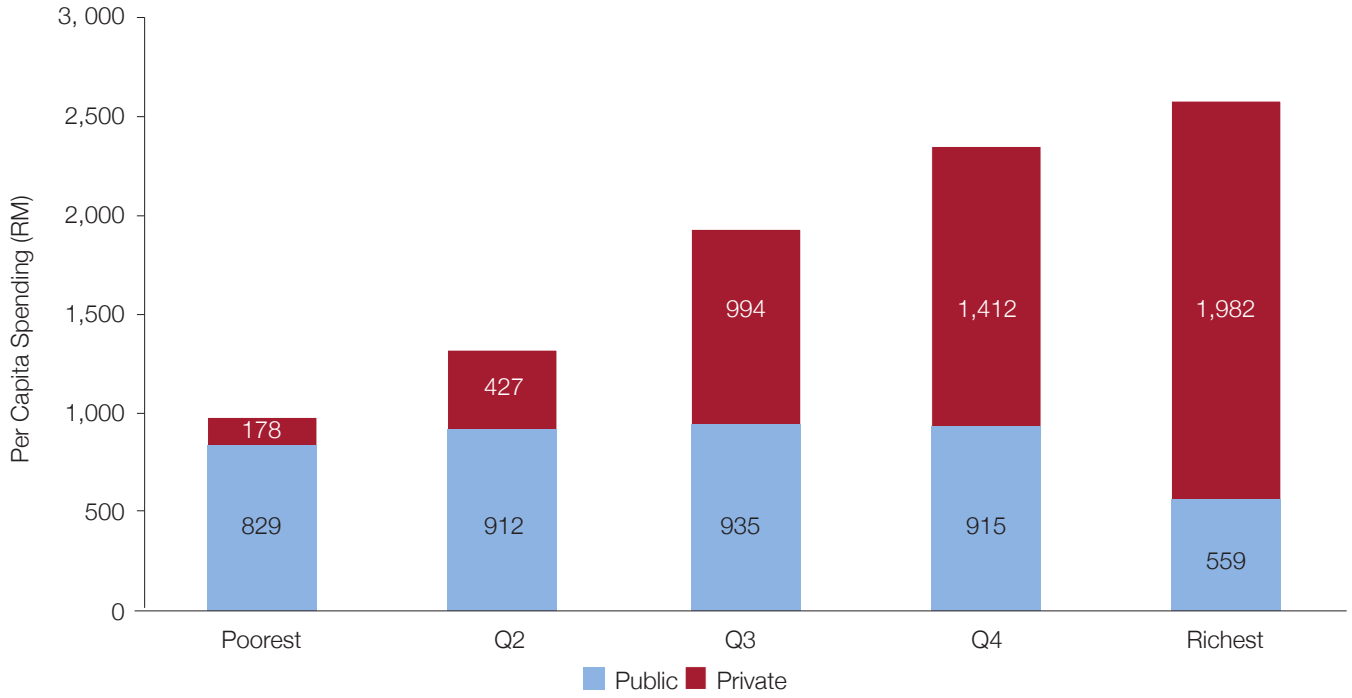
Composition of Health Expenditure

In Malaysia, the geographic distribution of per person public and private health expenditures is uneven (Figure 76). Sabah, Kedah, Johor, and Selangor receive relatively low shares of public health expenditures per person, compared with—for example—Negeri Sembilan. In some states, such as Selangor, the relatively low public health expenditures are accompanied by high private health expenditures. However, Sabah and Kedah, which have low public health expenditures per person, also have low private health expenditures, and therefore receive lower levels of total health financing per capita compared with wealthier states such as Kuala Lumpur, Melaka, and Penang [23].

5.3.4. Fiscal Space Analysis

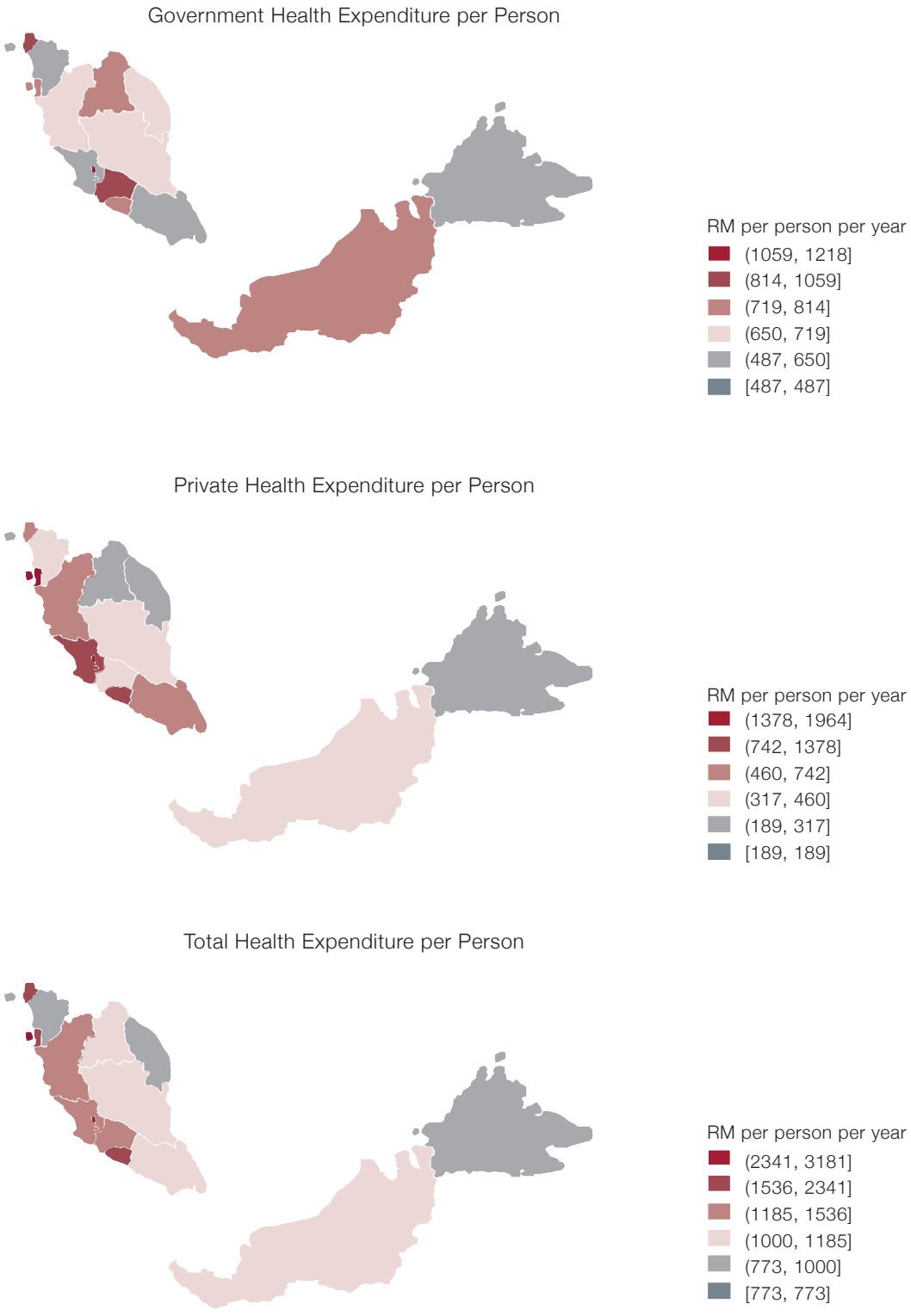
In considering options for health system reform, the Malaysian government will need to assess opportunities available for raising additional resources to fund the system. The term "fiscal space" refers specifically to the availability of government budgetary funds to provide additional resources for health without jeopardizing allocations to other priority sectors or the long-term financial solvency of the government.

Figure 75. Distribution of Public and Private per Capita Health Expenditures by SES Quintile, 2009



Data Source: Malaysia Health Care Demand Analysis Study (2013)

Figure 76. Geographic Distribution of Public and Private Health Expenditure per Person



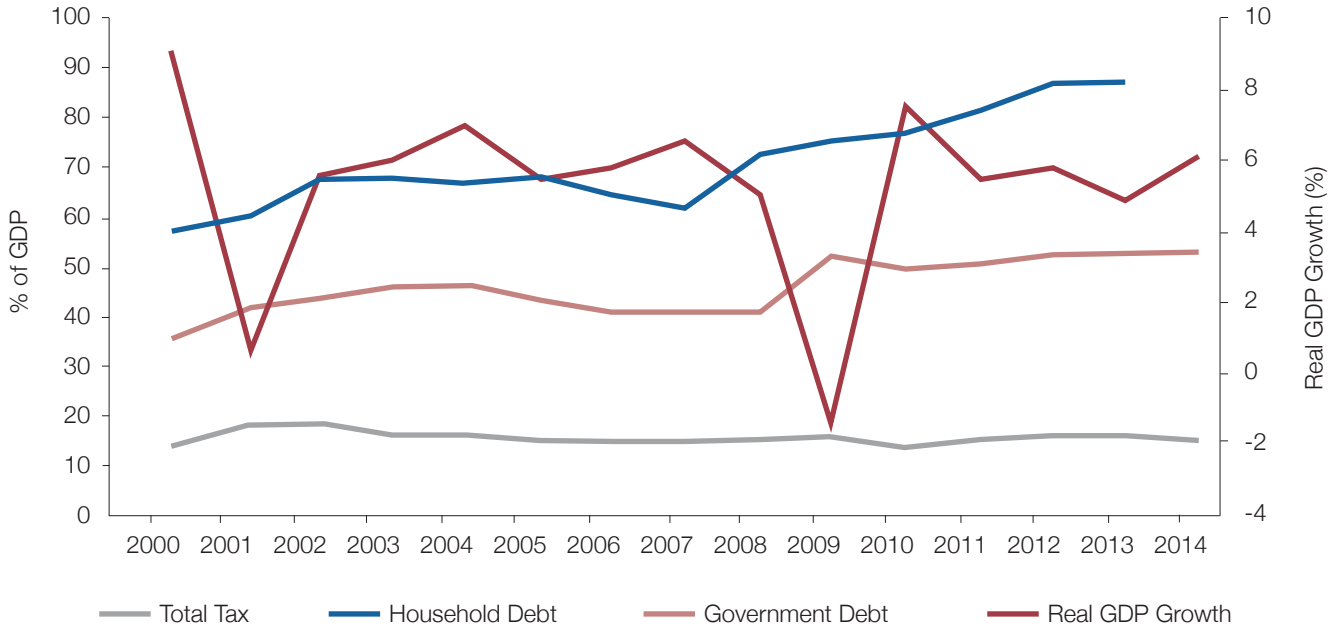
Data source: MNHA (2013)

The MHSR Health Financing Analytic Team explored four potential sources of additional government financing: (i) growth in general government revenues, (ii) reprioritization of health in the government budget, (iii) increased allocation from 'sector-specific resources' such as tobacco and alcohol taxes, and (iv) reducing subsidies to foreign users of the public health system. We discuss below the findings on the feasibility of sourcing additional revenues from each of these areas.

First, public financing for the health system could increase if rapid growth of government tax revenues were anticipated based on overall projections for economic growth or an expected increase in the tax-to-GDP ratio. Despite some fluctuations due to the Asian and the global financial crises, Malaysia has experienced annual real GDP growth in the range of 5–6 percent between 2000 and 2014. The tax-to-GDP ratio in Malaysia has ranged from 13–15 percent (Figure 77). Together, these trends mean that aggregate tax revenues have increased over time. However, declines over the last three years in the tax-to-GDP ratio have led to stagnating tax revenues, primarily due to the fall in tax revenues linked to oil and gas production [37].

An optimistic prognosis for increasing government revenues is limited by two additional considerations illustrated in Figure 77. First, household debt in Malaysia has increased consistently over the last decade as a share of GDP, rising from 56.6 percent in 2001 to 86.8 percent in 2014. Malaysian households are thus under severe financial pressure and are more likely to focus on de-leveraging than on spending in the near-term, which will limit GDP growth, and therefore tax revenues. Second, a similar trend can be observed with respect to government debt,

Figure 77. GDP Growth, Total Tax, Household and Government Debt in Malaysia, 2000-2014



Data Source: Bank Negara Malaysia

which has risen steadily from 35.2 percent of GDP in 2001 to 52.7 percent in 2014. The government has set a strict ceiling for the public debt ratio of 54 percent of GDP, meaning that additional resources through deficit financing are unlikely [37].

Second, a further possibility for increasing health funding is for the government to allocate a higher share of its existing budget to health. The share of health spending in the national budget has risen slightly from 8.2 percent in 2012 to 10.1 percent in 2016. Because these years were also characterized by a falling tax-to-GDP ratio, this trend indicates a commitment on the part of the government to protect health sector financing against revenue fluctuations. Given the fiscal constraints, major increases in budget allocations to health are unlikely to be feasible in the short run. In the context of the budgetary consolidation in 2014 and 2015, an increase in allocation to any ministry will mean reallocation away from other ministries and sectors. Nonetheless, if a strong case could be made for increasing health expenditures, the health sector could be allocated a rising share of the budget in the longer run as the budgetary situation eases [37].

Third, even if increases in health funding from the general government budget may be difficult in the near term, specific taxes—for example 'sin taxes' on tobacco and alcohol—could be appropriated to finance health sector needs. These types of excise taxes are commonly used both to discourage unhealthy consumption and to raise new revenues to support public health. Other countries in the region already earmark tobacco and alcohol taxes for health purposes. For example, Thailand allocates about two percent of its tobacco tax revenues to health promotion activities. Taiwan implemented its Tobacco and Alcohol Tax Act in 2002, specifying that tax revenues from increased rates of tobacco taxation would be allocated to National Health Insurance, anti-smoking programs, health promotion, and social welfare [37]. Many OECD countries also use tobacco tax revenues to finance health-related activities, including Australia, Canada, Finland, New Zealand, and some states in the United States.

Allocating tobacco tax revenue to health has already been debated in Malaysia. In August 2015, a cabinet note on this subject was prepared and presented by the Ministry of Health. The note proposed an increase in the tobacco excise tax of five percentage points each year for a period of five years. The note also proposed setting up a trust fund financed by the additional revenues to fund tobacco control programs. The government rejected that proposal, and revenues from alcohol and tobacco taxes continue to go into the consolidated fund. While these developments suggest that the potential for raising health resources through additional alcohol and tobacco taxes is not favorable at this time, a future proposal which would earmark revenues for strengthening the health system might be possible [37].

The Health Financing Analytic Team has conducted preliminary analysis to estimate the potential revenues from a 12.5–37.5 percent increase in the specific per unit excise tax on tobacco. Initial findings suggest that revenues would be in the range of RM 364 million to RM 1,095 million. Depending on how much the tax rate could be raised from its current level of RM 0.32 per cigarette, and the response of both consumers and suppliers, potential revenues could be as large as five percent of the current Min-

istry of Health budget of roughly RM 22 billion [37].

Fourth, a further possibility that has been suggested for increasing health sector resources is to eliminate the subsidies received by foreign citizens who use public health services. The Department of Statistics reports that there are approximately 2.4 million foreigners residing in Malaysia. As many as three-quarters of these are migrant workers covered by the SPIKPA scheme, a compulsory hospitalization and surgical insurance scheme for migrant workers who legally reside in Malaysia and are employed in blue-collar jobs other than domestic service or plantations. Participants pay an annual premium of RM 120 and receive benefits cover of RM 10,000 for care provided in public hospitals. Private insurers formally administer the scheme, and 25 insurance companies currently provide SPIKPA coverage. Insurance companies pay public hospitals at rates set by the Ministry of Health, which are thought to be considerably below the actual cost of services. In 2014, there were almost 1.8 million individuals who were covered under SPIKPA, with a total premium payment of RM 219 million. Claim loss ratios are extremely low, with payouts totaling roughly 10 percent of premium revenues in 2015, according to the Ministry of Health.

The Health Financing Analytic Team estimated the scale of these subsidies for foreign citizens, including both legal and illegal users, and found that public subsidies for migrants' health care lie in the range of RM 140–820 million, depending on the cost estimates used (both marginal costs and average incremental costs of health service use were used for projections). Given the size of the Ministry of Health operating budget, these are relatively small—but not insignificant—numbers [37]. The situation of the migrant workers—both legal and unregistered—needs further exploration.

Overall, while there may be scope to increase the public resources devoted to health in the longer term, the short-term prospects for substantial budgetary increases or efficiencies from eliminating subsidies to foreigners are not promising. The design of any policy reforms must take into account these fiscal space considerations.

5.3.5. Projection Modeling

The Harvard Team and Health Financing Analytic Team have developed a model to project the future path of health care utilization and spending in Malaysia under different policy scenarios. The basic structure of this 'cell-based' model has been formulated by defining population/cell categories and estimating health care utilization rates for each category based on NHMS data. Utilization measures include inpatient and outpatient care at public and private sector facilities. Population forecasts for each population group have been formulated based on the static assumptions. We are collecting further information about the price and income elasticities of demand for health services, as well as information about technological change. When cost estimates from the Health Facility Costing Study are available, these will also serve as inputs to the model, which can then be used to estimate the projected costs of various health reform interventions [37].

5.3.6. Private Health Insurance

According to NHMS data, in 2015, approximately one-third of the Malaysian population had some form of private health insurance (PHI) or employer-provided health coverage; the share covered by PHI was 23.6 percent. While PHI products have been sold in Malaysia since the 1970s, the market for these policies only took off after the introduction of personal income tax relief for the purchase of health insurance in 1996 and regulations loosening the restrictions on life insurers to sell health insurance in 1997. In recent years, the PHI industry has recorded significant growth. From 2009 to 2014, total PHI premiums (net of reinsurance) increased at an annual rate of 12.5 percent [53].

The PHI market is oligopolistic, with the top three insurers accounting for more than 50 percent of the market. Most health insurance policies are sold by life insurance companies, which offer individual coverage as a rider to life insurance policies. General insurers typically focus on group policies; this segment of the market is the fastest-growing. Finally, companies offering Sharia-compliant medical and health takaful also represent a significant portion of the market. In addition to individual policies, many private sector employers provide group coverage, typically negotiating packages with private insurance companies to provide policies for their employees. Some large employers offer medical benefits directly to employees [53].

Managed Care Organizations (MCOs), which are mainly third-party administrators, are also key players in the private health insurance market. MCOs specialize in the management and administration of healthcare schemes, and have assumed a larger role within the PHI market as insurers rely on them to reduce administrative costs and curb rising claims by exercising some control over the utilization of healthcare services by policy owners.

The PHI policies currently available on the market can be grouped into four broad categories:

i. *Hospitalization and surgical insurance* provides reimbursement of medical, hospitalization, and surgical expenses for covered conditions.

ii. *Critical illness insurance* provides a specified lump-sum benefit upon the diagnosis of illnesses specified in the policy such as cancer or heart attack, or a surgical procedure such as coronary artery bypass surgery.

iii. *Disability income insurance* covers a portion of income in the event that the policy holder is unable to work due to illness or injury.

iv. *Hospital income insurance* pays a specified sum per day of admission for any covered illness.

Typically, individual private health insurance policies in Malaysia do not cover outpatient care and beneficiaries often must be admitted to hospital before there is any coverage. Almost all benefits packages involve caps in benefits [53].

Medical claims from private insurance companies have been increasing rapidly, rising at an annual rate of 9.8 percent from 2010–2014 [53]. Discussions

with a large MCO and private insurance companies indicate that insurers have found it difficult to negotiate reductions in fees for physicians and laboratory/diagnostic tests, which account for almost 90 percent of hospital bills. Correspondingly, interviewed representatives from private hospitals indicated that insurers and MCOs do not have sufficient leverage (market power) to influence the prices they charge. This market condition typically results in increased spending, often with accompanying service quality, but without necessarily improving the clinical quality of care.

Private health insurers also incur high administrative costs of 20–25 percent of revenues; these costs include marketing, underwriting, and policy management, cost of billing, product innovation, commissions, and distribution. The efficiency and profitability of health insurers can be measured by loss ratios, which equal net claims incurred divided by net earned premiums. Loss ratios for the top 20 private health insurers are relatively low at 50–60 percent, according to Bank Negara, indicating inefficient operations [53].

5.4. Provider Payment Mechanisms

5.4.1. Public Sector Payment Mechanisms

Budget Process and Performance Management

The payment mechanisms used in Malaysia's public delivery system are line-item budgets and salaries. As described in section 5.3.2, the Ministry of Finance approves the Ministry of Health budget each year, taking into account historical expenditures and new policies. The Finance Division of the Ministry of Health then allocates operational budgets to respective programs and divisions within the Ministry of Health—based primarily on historical budgets, as well as new programs/policies—which are then allocated to state health departments and district health offices [7].

Budget allocations destined to the sub-national level and service delivery units are allocated as specific line-item budgets to state health departments, which then divide the allocated funds among district health offices and hospitals, again through line-item budgets. State health departments do not have autonomy to allocate the budget received across different programs, but can prioritize the relative importance of different programs to specific district health offices, according to local needs.

Most categories included in the line-item budgets are fixed (locked in) and cannot be reallocated. Fixed allocations include emoluments, pharmaceuticals, consumables of the various clinical departments, hemodialysis units, radiology and pathology, utility bills, security, and hospital support services. Hence, hospital directors have little flexibility in determining how to spend their budgets.

Budget allocations received at the start of the year are typically only about 70–80 percent of the full anticipated budget for the year, with the remainder of the budget allocated during the mid-term review or through ad hoc requests by responsibility centers (district health offices and hospitals, for example), thus allowing some flexibility to respond to emerging

needs expressed by lower level budget entities.

At the end of the year, the state health department reallocates excess 'locked in' funds to district health offices and hospitals with operational deficits. This sometimes results in excess funds allocated to hospitals, which must be spent by the end of the year. Unspent funds cannot be carried forward into the next year and have to be returned to the Treasury, which can have implications for the budget awarded in the subsequent year. There is thus an incentive to fully execute the budget each year. At the end of the year, if the allocated budget is still insufficient, the state health department can make a special request to the Ministry of Health for additional funds that will be paid in the following year [7].

The Malaysian government has recently introduced outcome-based budgeting, designed to link financing with performance, and the Ministry of Health is one of three 'champion' ministries to participate in the new initiative. Mirroring the budgetary process, program-specific Key Performance Indicator (KPI) targets are set at a national level at the beginning of the year, and assigned to program heads at state health departments, which in turn assign targets to district health offices or hospitals. There are regular reviews of performance with respect to targets, but performance is not yet linked budgets, or to any penalties or incentives for staff [7].

Payment and Benefits for Health Care Staff within Public Facilities

The health workforce within the public sector is paid using fixed monthly salaries, according to a salary scale with bands that vary by professional classification and grade. In addition, all public sector employees are entitled to allowances (Box 2), which make up approximately 20 percent and 50 percent

Box 2: Allowances for public sector employees

Examples of allowances include: (i) Housing, service and cost of living allowances for managerial, professional and support categories; (ii) Entertainment allowances for certain higher categories; (iii) Specialist and post basic allowances; (iv) Incentives allowances for 'critical services' which include doctors, dentists, pharmacists, nurses, and assistant medical officers; (v) Additional allowances for doctors serving as public health officers at district level, doctors serving as hospital directors, and doctors who are gazetted as specialists; (vi) Incentive pay for working in remote areas; and (vii) Hazard allowances, for example for healthcare personnel who work with radiation equipment.

Additional non-monetary benefits include: highly subsidized lifetime medical care in public sector facilities for the employee, spouse, parents, and dependent children; annual vacation leave; medical leave; maternal leave (maximum of 3 months) and paternal leave (1 week); travel allowances for official duty; free pre-service education and living allowances during enrolment in MOH training institutions; training (conferences, seminars, etc.); government loans (e.g. for housing and vehicle); office space according to grades (administrative); uniform allowances (e.g. for uniform, lab coat, and shoes). Higher-level officers enjoy additional benefits such as allowances for fuel, driver, tolls, telephone bills, etc. Finally, public sector health workers, as civil servants, enjoy retirement benefits.

of total gross salary for non-specialists and specialists, respectively.

Public sector retention

Retention of public sector doctors is an important issue, as many doctors depart the public sector after several years of practice for positions in the private sector. Private sector doctors command higher salaries, and the salary differential is especially large for specialists.

Interviews with doctors from both public and private sectors suggest that the job security and generous benefits offered in the public sector are important decision factors which favor employment in the public sector. Doctors interviewed as part of MHSR also point out that bureaucratic rigidity encountered working in the public sector (for example, lack of autonomy) is perhaps even more important than wages in driving them to move to the private sector [7].

The Harvard Team conducted a systematic review of the international literature to understand the movement of skilled doctors from the public to the private sector. The review assessed factors influencing doctors' choice of workplace and policy interventions for retaining doctors in the public sector. Six major themes affecting choice of workplace were identified: financial incentives, career development, infrastructure and staffing, professional work environment, workload, and autonomy. Policies used to retain staff in the public sector included regulatory controls, incentives, and management reforms [68].

A 2014 study by the Institute for Health Management specifically explored the issue of retention in the public sector in Malaysia [69]. In line with the findings of the systematic review, the study reported financial factors, career development, workload, resource availability, and management as factors affecting choice of workplace. However, another theme that was specific to Malaysia was the importance of 'social factors' for workplace choice. In particular, family commitments—including taking care of children and elderly and ensuring adequate opportunities for spouses in the location of work—were highlighted as being very important factors. In addition to addressing family needs, offering better salaries and benefits, promotions, and recognition based on job performance, improvement of hospital facilities, flexible work schedules, training opportunities, and reduction in workload were also identified as potential strategies to improve doctor retention in the public sector.

To date, a number of policies have been introduced in Malaysia to prevent 'brain drain' of public sector doctors to the private sector (Box 3).

5.4.2. Private Sector Payment Mechanisms

Private providers in Malaysia are primarily financed through direct out-of-pocket payments from patients, with a small share of revenues coming from private insurance or employer-based group insurance (Figure 78). The financing sources for most types of private facilities are relatively similar, although hospitals and ambulatory care facilities receive a higher share of revenues from private insurance, and hemodialysis centers receive most of their revenues from government agencies, SOCSO, and charities [7].

Box 3: Policies introduced in Malaysia to prevent 'brain drain' of public sector doctors to private sector

1. Time-based promotion for doctors, dentists, and pharmacists, replacing the former system whereby movement up the scale depended on the availability of vacant posts at higher levels;

2. A new wage scale introduced in 2011 for all public sector employees which greatly increased special allowances for certain categories and made other healthcare personnel eligible for post basic allowances;

3. Allowing doctors to practice in a private setting (locum) outside working hours;

4. Elective operations on Saturdays;

5. Extended hours in Ministry of Health clinics;

6. Compulsory services requiring doctors to complete two years in the public sector following full registration, as well as increases in compulsory public service for doctors who receive scholarships for specialty/subspecialty training;

7. Gradual increase in the retirement age from 55 to 60 years;

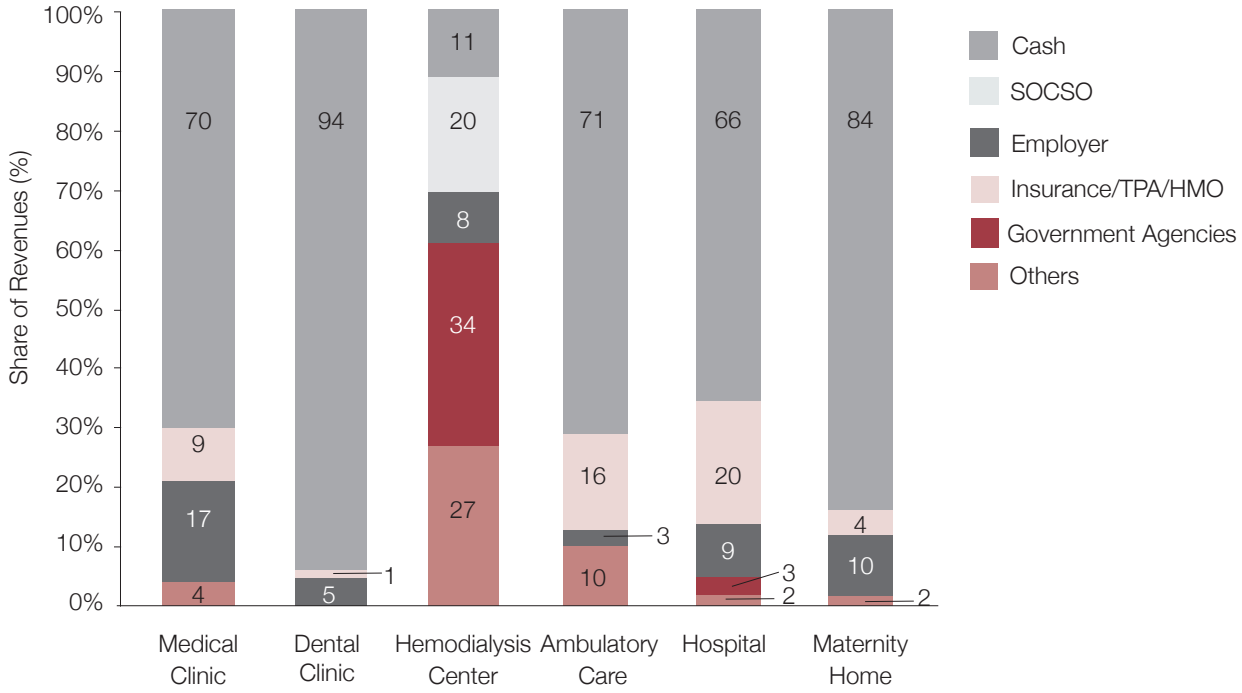
8. Full paying patients pilot: Started as a pilot, this policy has now been expanded to a number of other hospitals. Under this policy, specialists in public hospitals are allowed to practice in a private wing after their work hours, subject to certain restrictions on charges. Fees are divided between specialists and the Ministry of Health.

For self-paying patients, providers set their own prices, although consultation and procedure fees cannot exceed the maximum amount specified under the Private Healthcare Facilities and Services Act (Schedule 13). However, there is no control on total expenditure per visit or admission, meaning that private providers can increase revenues by prescribing or ordering additional tests and procedures [7].

There are a growing number of contractual arrangements between providers and private insurance companies, third party administrators, and employer-based group insurers. According to the Analysis of Financial Arrangements and Expenditure in the Private Sector study conducted by the Institute for Health System Research in 2012, most of these contractual arrangements use fee-for-service payment methods [70].

Using Department of Statistics data for 2013, the Provider Payments Analytic Team calculated the average profit margins for various categories of private providers (Figure 79). The findings show substantial profit margins in the range of 20–40 percent, and even higher profit margins for laboratories [7].

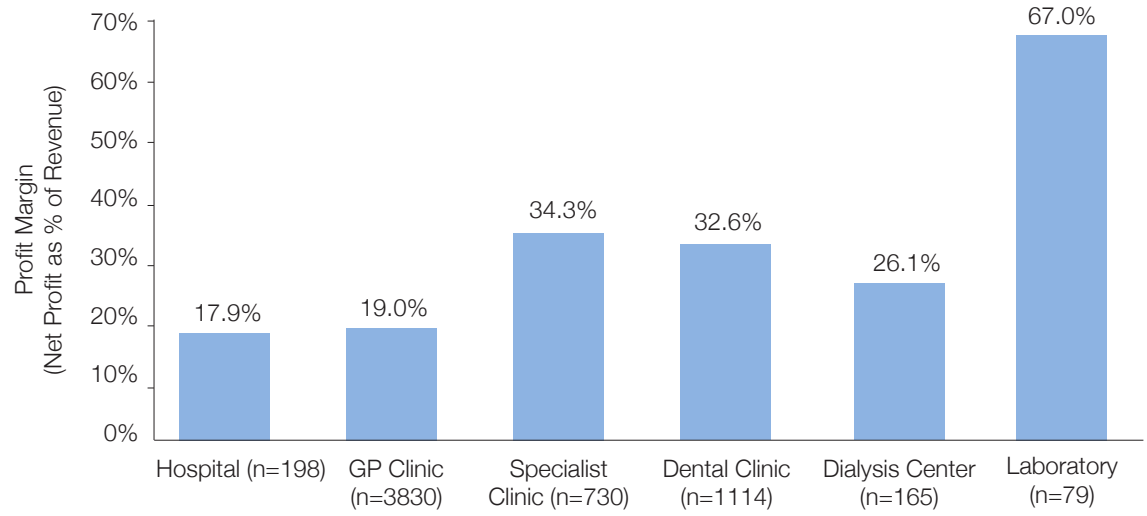
Figure 78. Financing Sources for Private Sector Facilities by Type



Data Source: Analysis of Financial Arrangements & Expenditures in the Private Sector, Institute for Health System Research (2012)
Note: TPA-Third party administrator; HMO-Health maintenance organization; SOCSO-Social Security Organization

Data on the private sector are very limited. A study is underway by the Provider Payments Analytic Team to collect additional data on prices, payment mechanisms, contracting arrangements, and capacity in the private sector through a survey of private clinics conducted in collaboration with private doctors' associations in Malaysia. Results will be reported when the analysis is completed.

Figure 79. Profit Margin of Selected Private Sector Health Providers (net profit [gross revenue - expenses] as a % of revenue)



Data Source: Department of Statistics (2010)

6. Diagnosing Causes of Health System Performance

6.1. Summary of Performance

Sections 2 and 3 of this report present our findings on Malaysia's health system performance, and Section 4 provides analysis of emerging opportunities and challenges. Section 5 provides a more detailed description of how the key functions of the health system are carried out—including organization/governance, service delivery, financing, and payments. These different components of the health system interact with environmental and contextual factors to produce the outcomes observed. This section explores and diagnoses causal factors that explain Malaysia's health system performance. Strategies to improve health system performance—our overall objective—must address the root causes of performance problems in order to be effective.

There is much about Malaysia's health system performance highlighted in Sections 2 and 3 that is excellent in comparison with international benchmarks. Malaysia has achieved rapid and large improvements in life expectancy and maternal and child mortality. Malaysia has an equitable and broadly accessible government-run healthcare delivery system that provides a comprehensive service package of primary, secondary, and tertiary care to all Malaysians as well as to a large number of non-Malaysians residing or working in the country. Government-provided services perform well in clinical quality assessments. The overall cost of the system is relatively low as a share of GDP, indicating system efficiency, although costs are rising. Malaysians enjoy a high degree of protection from unexpected high costs of health care, and this protection is distributed in a pro-poor way, resulting in an equitably financed system. Households express satisfaction overall with the health system, although stresses are emerging as new demands place pressure on—and increase waiting times for—government services, causing many who can afford to pay to opt for costly private alternatives.

In addition to successes, the in-depth analysis of Malaysia's health system carried out in collaboration with Malaysian colleagues and summarized in this report identifies several significant health system performance challenges. It also emphasizes that, without action to address these problems, many of them are likely to worsen in the coming years. Malaysia's overall health system performance has been excellent, but it has declined in recent years on a number of fronts. A brief summary of these challenges, described in more detail in Sections 2-4, includes:

- **System-level (macro) efficiency:** Overall health expenditures are rising faster than economic growth, with significant potential for future upward cost pressures related to growth of private healthcare services and private health insurance. While Malaysia still spends a small share of GDP on health, future scenarios suggest that expenditures will continue to rise both in absolute terms and as a share of GDP. Nonetheless, the future trajectory of expenditure growth and associated effects with income growth and development can be affected

considerably by the degree to which future spending is allocatively and technically efficient.

- **Health outcomes:** There are significant and growing gaps in progress on improving overall health outcomes. These gaps are visible in slowing rates of improvement in indicators such as child mortality, infant mortality, and maternal mortality, and are even more evident in the limited gains in adult life expectancy beyond age 30 and 60, where data show slower rates of change than in higher-income comparators. Given Malaysia's younger population, one would expect faster rates of improvement in life expectancy at age 30 and 60. These worsening trends can be linked to significant gaps in screening and treatment for NCDs such as hypertension, diabetes mellitus, and hypercholesterolemia, and in addressing rising rates of key risk factors that can be expected to lead to future increases in NCDs.

- **Financial protection:** Malaysia has relatively high out-of-pocket spending as a share of total health expenditure. In future, high out-of-pocket expenditures may be associated with a worsening trend in financial risk protection, and this problem may increase over time without remedial action. Furthermore, even if financial protection is currently not jeopardized by the high share of out-of-pocket spending, these funds represent a suboptimal financing source due to the lack of prepayment and pooling.

- **Responsiveness/satisfaction:** Dissatisfaction is evident with some key service-related aspects of government service delivery such as long waiting times, privacy, and choice, while in the private sector there is dissatisfaction due to high charges for services. These areas of concern may reflect limited government health expenditure growth and increased pressures on government services accompanying a slow-down in overall economic growth and household income growth.

- **Access to services:** There is limited access to more comprehensive primary care services in the government delivery system, including effective treatment and management of NCDs. Higher level public hospitals are crowded while lower level public hospitals have under-used capacity. Private healthcare delivery is also distributed unevenly across Malaysia.

- **Quality of care:** Government health care providers generally provide services in accordance with clinical guidelines. But there is an emerging picture of weak performance in reaching adults for screening and follow-up for major NCDs. The problem is not that the system is providing inappropriate care for individual patients, but rather that it is not doing what is needed on a population level to proactively improve overall health outcomes. This weak service performance results in large numbers of people being undiagnosed for common NCDs as well as those who are diagnosed receiving no treatment or sub-optimal treatment. There is hence both an access and a quality issue—the right services are either not provided or may ultimately be provided sub-optimally and not in the right locations (e.g. in a higher-level facility rather than in primary care). In other countries, this latter occurrence is also associated with

overtreatment of various kinds, a different type of quality issue. One important problem with quality of care is weak and fragmented health information systems and the absence of reliable and comprehensive data on service quality. In the absence of data, quality problems often are diagnosed ex post and policies to address them are not developed in a responsive way.

- **Service delivery (micro) efficiency:** Within the healthcare delivery system there is significant allocative and technical inefficiency. Allocative inefficiency can be seen in the relatively weaker performance addressing emerging NCDs and reducing avoidable mortality, as well as the relatively high share of ambulatory care-sensitive conditions treated in hospitals. Technical inefficiency is reflected in our preliminary findings related to cost variations across similar facilities and services.

Malaysia's performance problems emerge from two broad types of causes. First, the Malaysian health system has not evolved in line with the broader changes that Malaysia has experienced over the past several decades. There are major changes that have taken place (and are continuing to take place) in the context of health and the health system in Malaysia. Some of these, such as the rapid demographic and epidemiological transitions, are the consequences of success—rising affluence, increased life expectancy and ageing, better education, and rising expectations, among others. Some of these are also consequences of government policies in non-health related aspects of development—such as the encouragement of a mixed economy. There are also significant areas where the government has not responded adequately, or at all, to emerging problems and challenges. Errors of omission or commission in public policy affect government health care services but also affect the non-government side of the health system and users' response to the health care market that results. Second, the service quality of government health services has not kept pace with the expectations of citizens, who increasingly demand choice, personal attention, privacy, and rapid response to their needs. Consequently, many patients turn to private sector services.

The following sections unpack further our causal analysis in terms of different supply-side and demand-side factors that produce the performance results we have measured and observed.

6.2. Supply-Side Factors

6.2.1. Financing

Malaysia's total health expenditure—at 4.0 percent of GDP—is relatively low in comparison with other middle-income countries with similarly high levels of population coverage and service comprehensiveness. Government health expenditures from general revenues comprise about 54 percent of this total or about 2.2 percent of GDP, according to 2013 Malaysian National Health Accounts estimates (SHA framework). This is around US$ 500 in per capita purchasing power parity terms; a relatively low amount for an upper middle-income country system intended to provide universal coverage to a comprehensive package of benefits. The consequences of constraints on government spending over a long period can be seen in the growth of pri-

vate spending—both out-of-pocket spending and private health insurance. Private insurance now provides about eight percent of Malaysia's total health expenditure with about a third of the population having some type of private or employer-provided health insurance coverage [37, 53].

National Health Accounts measures do not include some other important components of health-related spending, such as social services associated with old age and disability, which can offset some health spending or make health spending more efficient. However, in Malaysia, government spending for long-term care and social services for the elderly is extremely low and represents less than one percent of government health expenditures.

The relatively low spending on government services in Malaysia should be seen as a cause of some of the noted shortfalls in health outcomes and responsiveness. It is also a likely cause of the relatively large share of private spending in Malaysia, which exists despite a national health system that offers universal coverage. Nonetheless, it is important to note that Malaysia has been successful in protecting all citizens, and particularly lower-income citizens, from financial risks related to spending on private services. To some extent, however, this protection may come at the expense of sub-optimal health outcomes resulting from weaknesses in the quality of government services delivered (for example, limited comprehensiveness of care for NCDs).

Malaysia will almost certainly need to increase its total health spending over time to achieve substantial improvements in performance. However, the amount and timing of increases may depend as well on health system reforms related to sources and systems of financing. There are key policy choices around how much of future expenditure growth should be financed through general taxation versus other methods. General taxation can be a more efficient (due to lower administrative costs) and equitable (due to greater opportunities for progressive taxation policies) form of funding for health. But it can also have consequences for economic growth when fewer revenues are available for economic and social development activities.

6.2.2. Payment Incentives and Purchasing

The way in which health care is paid for embodies financial incentives for the behavior of both providers and consumers. Purchasing refers to the development of deliberately designed payment incentives to achieve specific performance outcomes. Malaysia's health system includes a variety of payment mechanisms but very little purchasing. The public and private sectors of Malaysia's health system differ greatly in terms of payment methods and their incentive effects.

Government health services are almost entirely paid for through a centralized, top-down budget system that allocates funds according to input categories (line items). Budgets cascade downwards from the national Ministry of Health to states, districts, and individual health facilities, such as hospitals. Budgets are programmed according to divisions (programs) within the national ministry, and similar structures are in place at state level. Managers have little flexibility to move funds within or across departments or functions. As in most health systems, human

resources account for a large share of total spending, which in Malaysia are paid for in a centralized way, with limited managerial authority to hire, fire, or move staff at lower levels. This type of payment system provides a high degree of financial control and predictability of resource use, but leads to limited accountability of managers by not linking resources to results. Incentives to improve performance are largely related to promotions that are, to a large extent, time-based. Government services rely more on professional ethics, civic motivation, and managerial tools such as Key Performance Indicators, training, changes in work protocols, and supervision to improve performance.

Compensation policies for government health employees may have some causal effects on performance, but overall financial performance incentives for staff in government service are weak. The most senior providers in government services—specialists in government hospitals—are paid significantly less than their private sector counterparts. These providers frequently leave government service once they gain experience and reputation.

In the private service delivery sector, payment incentives have potentially strong effects on provider behavior, but these are not always linked to behaviors that result in better health system performance. Private providers in almost all types of private healthcare facilities receive more than two-thirds of their revenues in the form of out-of-pocket, fee-for-service payments by patients. The fee-for-service payment system provides a strong incentive to see more patients and to provide more services to each patient. While provider fees are regulated, there is wide scope for selling other discretionary health care inputs—such as drugs and tests—for which prices are unregulated. These incentives can lead concurrently to higher quality care as well as to 'supplier-induced demand,' associated with unnecessary and inappropriate care. The degree to which these effects take place and their specific expression in relation to different diseases and treatments can affect health outcomes, financial protection, and quality of care.

Pooled financing, which in Malaysia is almost entirely found in the private health insurance sector, can be a strong vehicle for use of purchasing to set incentives positively linked to performance. About one-third of Malaysians have some type of private or employer-provided health insurance. However, private insurers report very limited ability to monitor or control service delivery costs in a fragmented private healthcare delivery market largely dependent on out-of-pocket spending. Insurers are experiencing rising costs, which may also reflect increasing market power of providers to determine how much care to provide to patients, with uncertain implications for quality and efficiency [53]. The absence of purchasing indirectly incentivizes behaviors that can harm health system performance.

6.2.3. Organizational Structure of the Delivery System

Historically, the Malaysian health system has been based on a 'national health service' model, with government financing from general revenues and a government-owned and operated comprehensive service delivery structure offering public health, primary care, and secondary and tertiary care services.

A broad and deep benefits package is provided at little or no direct cost to patients and is available to all Malaysians.

What we observe today is a significantly mixed system with 45 percent of financing from private sources and 23 percent of hospital admissions and 40 percent of outpatient consultations delivered by private providers. This mixed health system is a consequence of policy choices made in earlier periods, which favor a mixed economy, including in the health sector, and allow private financing and provision to meet population needs and demands not met by government services.

Our MHSR research shows that the distribution of government and non-government health care is highly diverse across Malaysia. Private provision is relatively concentrated in a few states and in urban centers. Government provision is much more widely and equitably distributed, but there are also large differences across Malaysia in availability of and access to more comprehensive primary health care services and to high technology hospital-based services.

With caveats about making overly simplistic generalizations for Malaysia as a whole, government services have arguably excelled in providing basic maternal and child health services and in establishing communicable disease control programs, as well as in developing widely accessible hospital services. But the private sector has filled in various gaps—providing a significant share of primary care services for adult needs, outpatient specialist services which often overlap between primary 'first-contact' care and outpatient referral services, and a wide range of secondary and tertiary services which meet demands for quicker access and perceived quality especially in urban areas. The private sector provides these services predominantly for the middle- and higher-income groups in Malaysia, while the government continues to be the main source of care for the poor and rural populations.

Malaysia remains committed to this pluralistic health care system, which has important causal effects on all aspects of performance. A useful classification for discussing the organizational structure of healthcare delivery divides care into four types of services provided:

i. Services focused on populations—such as vector control, food safety, environmental sanitation, and mass communications for behavior change;

ii. Preventive and promotive services focused on individuals and families, such as immunization, antenatal care, screening and counseling for risk factors and NCDs;

iii. Treatment of disease on an outpatient or ambulatory basis, as well as provision of care in the community or at home;

iv. Treatment of disease on an inpatient basis.

These types of services can be mapped onto types of providers and to government and non-government ownership of providers. Generally, services of type (i) have been the domain of government providers, largely through the district-level public health system with some activities managed from higher levels such as state and national level. Services of type (ii) and (iii)—the bulk of what we typically consider as

primary health care—present a more complex picture. Both government (MOH) and non-government providers play important roles. And their roles differ by types of problems and by the geographic distribution of providers in the different sectors.

For example, immunization and antenatal care are largely provided by MOH primary care facilities, although for higher-income individuals there is some use of private primary care and specialist delivery. However, for some NCDs, the picture may be more complex and encompass a larger private sector role in areas where the private sector is more present (such as Penang or Klang Valley), compared to those where it is not (rural parts of peninsular Malaysia as well as Sabah and Sarawak). The division of roles also includes scenarios where patients move between the public and private sectors to leverage the benefits of each sector (for example, obtaining drugs at a nominal price at public providers while using private sector providers for routine monitoring of chronic conditions).

For type (iv) services, private hospitals, where they are available, cater mainly to middle- and high-income patients, while government hospitals still account for the largest share of admissions and are the primary provider for low-income and rural populations.

This mixed picture of availability and access is associated with technical and perceived quality differences and strongly influences the outcomes we observe. For example, waiting times or low service quality in government facilities may result in adult patients seeking private providers including specialists for outpatient screening, counseling, treatment, and referral for NCDs, with effects on health outcomes, financial protection, and patient satisfaction. And for some government hospital services, financing constraints result in patients facing long waiting times and bearing some out-of-pocket costs, which affects financial protection and satisfaction.

Our analysis identifies gaps in the comprehensiveness of primary care, fragmented primary care organization, poor continuity of care, and weak coordination between primary care providers and secondary and tertiary care providers. In addition, coordination between government and private providers is lacking. Collectively, these health system shortcomings are important causes underlying a number of the performance shortfalls we have documented in relation to health outcomes and user satisfaction.

The problems identified at primary health care level and in coordination between primary and secondary care levels may also result in related performance problems emerging in the hospital sector, including overcrowding in government hospitals, in part due to the high burden of admissions for ambulatory care-sensitive conditions.

It is not practical in this report to try to document all the potential causal pathways and their consequences for performance outcomes. But our analysis suggests that much of the causation is structural in its source, and relates to the way the health system is organized, with limited continuity and coordination within and between primary, secondary, and tertiary care, and between the public and private sectors. The health system organization requires attention to multiple levels of healthcare delivery and both government and private providers. Financing, pay-

ment methods, and regulation must also be aligned. The private insurance sector may be important in some areas. Simple solutions of training and revised managerial processes within existing structures are not likely to be sufficient to remedy these causes of sub-optimal performance.

Within the government services, organizational structure and management practices (discussed below) reduce the ability to create innovative solutions and to rapidly address problems as they arise. The highly centralized, top-down processes of budgeting and management substantially impede the generation of local organizational solutions. We note, for example, that at the national level, public health and primary care are combined under the same program, although some public health functions such as regulation are fragmented into other programs. Oral health services (which include dental public health, primary care, and specialist care) are covered under a separate program, pharmaceuticals under a third, and hospital services under a fourth. This structure is reproduced at state level as well. Service delivery in the government system is heavily influenced by these vertical silos, fragmented responsibilities, and highly routinized operational procedures, which leave little room for managerial flexibility. Our observations and discussions with managers at different levels suggest that these bureaucratic structures make it very difficult to perform population or geographic-based comprehensive planning and management to address local or regional needs.

6.2.4. Human Resources and Training

Health care is a human resources-intensive sector. In Malaysia today, 43.7 of government health expenditure pays for the staffing of the government health system, according to Malaysian government estimates [26, 71]. Our analysis investigated two areas of potential performance problems related to human resources for health (HRH): the supply and the composition (mix) of human resources.

The numbers and composition of health workers is highly variable across countries due primarily to historical factors. Other than the widely accepted view that there should be a substantial cadre of non-physician staff to leverage the more highly trained and costly physician staff, there are few specific norms that can be used to assess HRH.

Malaysia's HRH levels are below those of most high-income countries but similar to those of other upper middle-income countries. There is no evidence of performance problems related to the total number of health workers in the country. However, there may be causal linkages between performance shortfalls and the composition of the government health workforce, its location both geographically and within the health care delivery system, and the training and service performance capacities of the health workforce.

As noted earlier in this report, there are large gaps in identification, prevention, and treatment of important NCDs, shortfalls in progress addressing avoidable mortality, and high levels of hospital care for ambulatory care-sensitive conditions. These indicators can be linked to health outcomes, access, quality, and efficiency. HRH composition, placement, and technical capacities are likely to causally contribute to these intermediate and ultimate outcomes, although

the evidence available does not permit a detailed quantification of that contribution.

Some examples may help illustrate these pathways. Primary care providers—doctors, nurses, and paramedical workers—at lower level primary care facilities may be insufficient in numbers or training to meet the full need for NCD screening, counseling, treatment, and referral for the populations they cover. Within the Ministry of Health, the distribution of Type 1-3 clinics is much less extensive than more basic facilities. 1Malaysia Clinics are intended to fill access gaps especially in poor urban communities, but are not designed to meet needs for effective diagnosis and comprehensive management of NCDs. In more rural remote parts of Malaysia, especially Sabah and Sarawak, there are well-known problems of recruitment and retention of qualified staff.

Analysis done for this report also explored modeling future HRH needs for Malaysia. This is a notoriously difficult and inaccurate task, requiring many assumptions about future supply and demand for services. Preliminary modeling suggests that Malaysia does not face an acute problem of HRH supply going forward, although the recent challenges identified above need addressing through organizational interventions and careful planning. Therefore, attention may be best focused on the composition, location, and training of the health workforce, along with associated reforms in payment incentives, management, and healthcare organization to improve the contribution of HRH to overall health system performance.

Quality of services provided by healthcare workers in public clinics and hospitals is relatively good, as assessed by patients and in comparison with the private sector. There are no data on the technical quality of services relating to the causes of low levels of screening, counseling, and treatment for NCDs, however. Analysis of quality of services in primary health care and clinic responsiveness also reveal reasonably high levels of satisfaction with the services provided. The quality of care analyses at primary care level highlighted the relative lack of continuity for patient care and weak referral systems. These findings reinforce our sense that there are important performance challenges related to HRH, but less related to overall supply than to aspects related to training, management, organizational structure, and incentives.

6.2.5. Management

Malaysia's Ministry of Health benefits from a highly dedicated and competent cadre of experienced managers who are profoundly committed to better health for the Malaysian people. We have been deeply impressed by our engagement with a large and energetic team of counterparts in the Ministry of Health. This is a hugely important asset whose value cannot be overstated. We have identified four key areas where management gaps may contribute to the causation of health system performance problems.

First, as already discussed in Section 6.2.3, management responsibilities as distributed within the Ministry of Health organizational structure may help cause and amplify coordination problems at lower levels. We note that multiple programs might be essential in order to develop a multi-sectoral primary care approach, which already exists but needs to

be substantially strengthened, but no single division currently has full responsibility for primary care, where the vast majority of health services (exceeding 90 percent of total number of services) are provided in health systems with advanced primary care. Some programs have functional responsibilities (such as prevention) while others have product responsibilities, (such as management of diabetes). Primary care exists under the Public Health program, but has little linkage with hospitals. The rigid top-down structure makes greater flexibility and coordination/integration difficult at lower levels. State-level health directors, many of whom have served in national level positions, express the managerial challenges they face as a result of these rigidities, as do facility managers.

Second, while we note that the MOH has been one of the lead agencies in the Government of Malaysia to implement outcome-based budgeting, our observations suggest that the development and use of key performance indicators (KPIs) are not well designed to enable significant performance improvements. The available KPIs are often too narrowly focused. We note an overemphasis on indicators of inputs and outputs that may be incomplete. There is insufficient attention to population-level evidence on health needs and overemphasis on maternal and child health relative to adult health needs, NCDs, mental illness, disability, and injuries. Performance is often measured not in relation to population-based indicators such as effective coverage but rather simply as year-on-year increases in inputs, processes, or outputs. There is little attention in the KPIs to services delivered by the private sector.

Third, Malaysia seems to be a very data rich environment, but performance improvement is impeded by problems of data quality, data integration, data access, and timely analysis to produce information and context-relevant intelligence, especially for managers at lower levels. When this is combined with budgeting, organizational, and process rigidities, scope for effective response and improvement is significantly constrained.

6.2.6. Physical Inputs

Overall, we find little evidence that physical inputs are a major causal factor in performance. Malaysia has invested successfully in an extensive and widely accessible system of health facilities and a strong cadre of professionals to deliver services. Physical inputs are largely available and widespread, and used according to standard protocols and procedures. There is some evidence of shortages in commodities and devices, requiring patients to purchase some inputs, and in capacity for high-technology procedures such as CABG, PCI, and radiotherapy. This affects health outcomes and patient satisfaction. The underlying cause is most likely related to overall financing constraints on public services and other factors discussed above.

6.3. Demand-Side Factors

The performance of a health system reflects the interplay of supply and demand for health and health care. In a mixed system like Malaysia's, with extensive access to government services at little or no cost, one can observe the expression of citizens' demands in the development of the private health sector, which emerges to fill gaps in public service provision. With few linkages between the public and

private sectors, and free choice of providers, patients often shift between government and private providers to make the best use of what each sector offers in order to meet their needs.

While no country can afford to deliver everything citizens might need and want from the health system, improving system performance must be based on some understanding of the perceptions of system users. This is especially important in democratic societies, where political support is an important factor driving policy. Successful reforms also help shape and respond to citizen demands.

Creating effective demand requires timely and accessible information, health literacy, and targeted education to shape citizen expectations and to enable citizens to make appropriate use of health services. To date, the predominant focus of investment in the health system has been on the supply side, with inadequate attention to demand-side interventions and targeted programs to 'nudge' patients toward more effective health behaviors and utilization patterns.

Although individuals cannot be forced to live healthily, there are evidence-based behavioral interventions that can encourage healthy lifestyles, while preserving autonomy and choice. These 'nudges' draw from human psychology, recognizing that humans are prone to cognitive biases, fallacies, and heuristics [72, 73]. Examples of behavioral interventions used in other contexts include providing default options for retirement savings or medical plans, placing healthy items near the check-out line in workplace or school cafeterias, sending automatic reminders for health screenings, or providing 'commitment devices' to help individuals follow through on desired plans [72, 73]. These principles could be contextualized and extended to Malaysia, for example through mobile phone reminders, small incentives, or making healthy choices easier or more accessible.

6.3.1. Physical Access

Utilization rates for outpatient and inpatient services are still relatively low compared to high-income comparators, but not to a degree that suggests substantial constraints to physical access preventing use of services. However, our more detailed analysis of the geographic distribution of specific types of health facilities and population concentrations does identify some gaps that could contribute to the performance problems identified.

Higher capacity and comprehensive primary care facilities, such as those equipped with laboratories and able to deliver primary care services of wider scope, are more concentrated in densely populated areas. These facilities are better able to address emerging adult health needs and NCD problems on site, requiring less referral for tests and depending less on good communication between different levels of the delivery system, which evidence suggests is lacking.

Assuring physical access to dispersed rural populations for advanced treatment, such as radiotherapy, is a worldwide challenge, including in Malaysia with its diverse geography. New organizational strategies employing advanced information technologies and mobile services could help address these issues, but they need to be aligned with user perceptions.

As noted earlier, private service delivery is more concentrated in some states and urban areas. Urban populations are more likely to find opportunities to meet their demand for quicker service or higher perceived quality. The more concentrated distribution of private providers likely impedes access to those in less well-supplied locations, increasing dissatisfaction with gaps in government delivery that cannot be met by accessing private care.

6.3.2. Financial Access

Malaysian leaders are justifiably proud of the high degree of financial protection and equitable distribution that results from the country's extensive, low-cost public delivery system. Although out-of-pocket spending is high relative to total health expenditures, it appears largely concentrated in middle- and high-income groups and remains relatively low as a proportion of GDP.

We suspect that the progressive distribution of out-of-pocket spending is in part a reflection of a lack of purchasing power to realize the desire for private services among lower income citizens—since NHMS data do reveal that the poor are less likely to use private services. Also, most private health insurance plans do not cover outpatient care.

Surveys of user satisfaction in Malaysia also highlight concerns about long waiting times for government services, which point to potentially significant opportunity costs for those waiting to receive services.

6.3.3. Health Producing Behaviors

Health producing behaviors in individuals and families are important determinants of many of the emerging health outcome problems noted in Malaysia. Rising levels of obesity are associated with diet and diet changes as well as physical inactivity. Diabetes, hypertension, cardiovascular disease, and cancers all have behavioral and lifestyle-related causes.

Public health programs—especially health communication interventions such as those in the media and schools—are usually seen as the main strategy for improving health-producing behaviors. But another significant source of influence is advice and counseling given in clinical settings—at instances of first contact care, screening, and treatment. Group interventions and interventions using peer networks also substantially influence behavior. We have little evidence of the degree to which this is being done and being done effectively in both the government and private sectors.

6.3.4. Awareness of Need and Health Seeking Behavior

Another significant set of demand-side factors linked to performance problems relates to perceptions of needs that lead people to seek both preventive care and treatment and also to act on medical advice and comply with treatment recommendations and follow-up.

Widely accessible free care is available for screening and primary care treatment for common NCDs. The remarkably high percentages of undiagnosed and untreated individuals with diabetes mellitus, hypertension, and hypercholesterolemia imply large gaps in routine screening and outpatient care for these and other conditions. In part, this may be

due to supply-side shortfalls in primary health care outreach to populations. But a substantial part of these gaps are almost certainly related to lack of understanding and appreciation among patients of the need for these services and their potential benefits.

Demand for health services and patterns of health-seeking behavior are influenced by a variety of factors, including individual characteristics (such as age, gender, cultural attributes, and health beliefs), enabling factors (such as income or insurance status), and need factors (health status) [74]. In Malaysia, the culture of health-seeking behavior is such that individuals generally seek health care only when they are experiencing symptoms, and rarely for screening or preventive services [75]. This aligns with and reinforces a 'curative care model' on the supply side, in which patients come into contact with providers only when they seek treatment for illness, without routine monitoring or outreach to defined patient populations. Treatment adherence for management of chronic disease is also a well-recognized problem, although evidence is limited, and there are few existing demand-side interventions to promote adherence [76]. Further analysis of treatment adherence is needed.

In the traditional Ayurvedic, Chinese, and Malay belief systems of Malaysia's three main ethnic groups, illness is generally viewed as a temporary rather than a chronic or lifelong condition; this affects patterns of demand for and adherence to chronic disease management [75]. In addition, the use of traditional and complementary medicine (TCM) is widespread in Malaysia, often complementing Western medicine [75]. A 2009 study found that around 70 percent of the population had used TCM in their lifetime, with nearly 56 percent having used TCM in the past year [77].

The National Strategic Plan for NCDs includes provisions for expanding population outreach through schools, workplaces, and community-based programs (such as health camps), as well as greater use of both traditional and social media to raise awareness about NCDs and increase demand for preventive care and screening [78]. In addition, the MOH program Healthy Communities Make a Strong Country (KOSPEN) has expanded community outreach for health promotion through the use of volunteers.

6.3.5. Quality Perceptions

User perception surveys report little difference in perceptions of overall quality between government and private providers (see Section 2.4). However, there may be differences in perceived clinical quality across levels of care (for example, clinics compared to hospitals) in both the government and private healthcare delivery systems. For example, the preferential demand for higher-level government hospitals as sources of first contact care, or the demand for private specialists to deliver first contact outpatient care, are partly due to perceptions of clinical quality differences.

Citizens' perceptions of service quality—waiting times, amenities, choice, etc.—are the other major factor explaining demand for private health care. Long waiting times and lack of choice in public facilities are the primary sources of dissatisfaction reported in surveys. In the QUALICOPC survey of public primary care providers, responding doctors

and patients also note a lack of care continuity, lack of a regular provider, and weak communication and referral links between primary and higher level facilities. Among private providers, high out-of-pocket costs are the major perceived problem.

6.4. Implications for Policy

This section has highlighted the many positive and substantial accomplishments of Malaysia's health system, but also a broad array of causes on both the supply and demand sides that explain emerging and ongoing performance challenges. Malaysia has a significant and unique opportunity to advance its health and health system as it continues its march toward becoming a dynamic high-income economy and society. It can forge a path that other emerging economies will be able to learn from and follow. But to do this it must embrace a profound change process over a significant time period.

Some high-level implications of the diagnostic analysis presented here include the following:

- It is virtually certain that Malaysia will need to spend more on health in the coming years as the growing population ages and the burden of disease continues to increase and shift toward NCDs. However, the size of future increases in health spending and their effectiveness and efficiency in improving system outcomes can be significantly affected by policy choices around sources of financing, use of purchasing and incentives, organizational reform in service delivery, and other health system functions.

- Greater clarity about performance objectives and wider introduction and use of strategic purchasing for both government and private sectors are key strategies to improve performance.

- There is a pressing need to reorient health service delivery away from hospital-centric acute care to a model that emphasizes promotion of health, disease prevention, and effective management of chronic illness, through comprehensive primary health care, community-based services, and user engagement.

- The citizens of Malaysia have experienced profound changes in income, education, lifestyle, and other factors that affect their health and how they perceive and use health care. A significant part of the change strategy must focus on demand-related factors affecting health and health care use. This will require new capacities and interventions in both government and private health care sectors.

- The changes implied for Malaysia by our diagnostic analysis will require significant investments in new skills and technical capacities at national and sub-national levels and in both government and private sectors. This includes the need for more and better evidence and monitoring and evaluation of change. Reform must be a learning and adaptive process, not only one of strategic policy change.

- Government service delivery improvement requires more than greater investment and better management and training. There are important causes of gaps in service performance related to organizational structure and governance. These will require deeper change processes than have been undertaken in the past. Without attending to these underlying causes, results are unlikely to meet expectations.

7. Conclusions

In this report, we have described the key findings from a comprehensive analysis of Malaysia's health system and diagnosed potential causes of current and emerging performance challenges related to contextual factors and health system functions. In conclusion, we would again stress that Malaysian policymakers are in a unique and timely position to transform the future trajectory of their country's health system. While the health system is under pressure, due both to changing contextual factors outside the realm of health policy as well as structural factors tied to health system functions such as financing, payments, service delivery, and governance, the current environment presents not only challenges but also opportunities. Building upon the historic successes of the health system, the commitment and political will of Malaysian leaders to achieve health system improvements, an engaged populace with high human capital, and Malaysia's position at the cusp of becoming a high-income nation, we believe that Malaysia can steer a course toward a modern health system that would be equitable, efficient, effective, responsive, and sustainable. By achieving this transition, Malaysia could serve as a model, providing useful lessons to other middle- and also high-income countries as they grapple with many of the same health system challenges currently faced by Malaysia.

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Appendix 1: Malaysia Health Systems Research Methodology and Working Arrangements

Malaysia Health Systems Research (MHSR) is a collaboration between the Government of Malaysia and the Harvard T.H. Chan School of Public Health. Carried out jointly by 'Team Malaysia' and the 'Harvard Team', Phase I was organized across nine interlinked 'work packages': (1) Policy Analysis, (2) Performance Assessment, (3) Political Economy & Institutional Analysis, (4) Health Service Delivery, (5) Health Financing, (6) Provider Payments, (7) Pharmaceuticals, (8) Health Information Systems, and (9) Human Resources for Health. Each work package was led by a Harvard Investigator and Senior Advisory Team or Research Team Focal Point. Specific research areas were further divided across 23 'Analytic Teams' under Team Malaysia.

The MHSR methodology is based on a model of collaborative research between the Harvard Team and Team Malaysia. This model ensures that research is policy-relevant and grounded in Malaysia's contextual realities. It also strengthens research networks in-country and builds capacity for evidence-based policy. In Phase I, collaboration and capacity building were achieved using various means, including experiential learning through joint research and analysis, methodological workshops, training courses, and problem-solving technical support.

The study teams and working arrangements are described in more detail below.

Team Malaysia is composed of:

- **Steering Committee:** An advisory committee including high-level stakeholders and government representatives who provide guidance/input on MHSR findings and the strategic plan.

- **Research Management Team (RMT):** Core team which oversees the management and coordination of the study.

- **Analytic Teams:** Research teams that work directly with the Harvard Team on data collection, analysis, and synthesis, and present the findings of analysis to the Consultative Group and Senior Advisory Team during Analytic Team Workshops (held in June and December 2015). Each analytic team is led by a focal person who communicates with the Harvard Team on a day-to-day basis.

- **Consultative Group:** A broader group that meets on a quarterly basis with the analytic teams and Senior Advisory Team to discuss the work packages, and provides input on/validates the findings of the analytic teams.

The Harvard Team is composed of:

- **Principal Investigators:** Senior Harvard faculty assigned to lead each of the nine work packages. Each investigator is responsible for identifying synergies and coordinating activities (including data collection) across work packages.
- **Management and Administrative Team:** Core team responsible for management and coordination of the study.
- **Senior Advisory Team:** Team of faculty/researchers with responsibility for the different work packages and for providing guidance and oversight to the Harvard Research Team and Team Malaysia analytic teams.
- **Research Team:** A team made up of faculty, post-doctoral fellows, research associates, and doctoral students, working in partnership with analytic teams to carry out research and analysis.

Figure A1.1. Management and Coordination of Work Package Teams

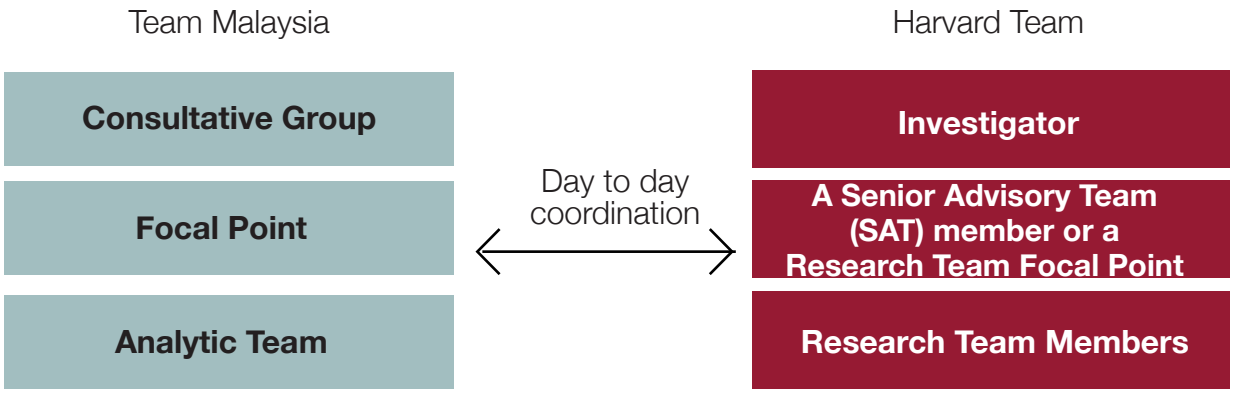
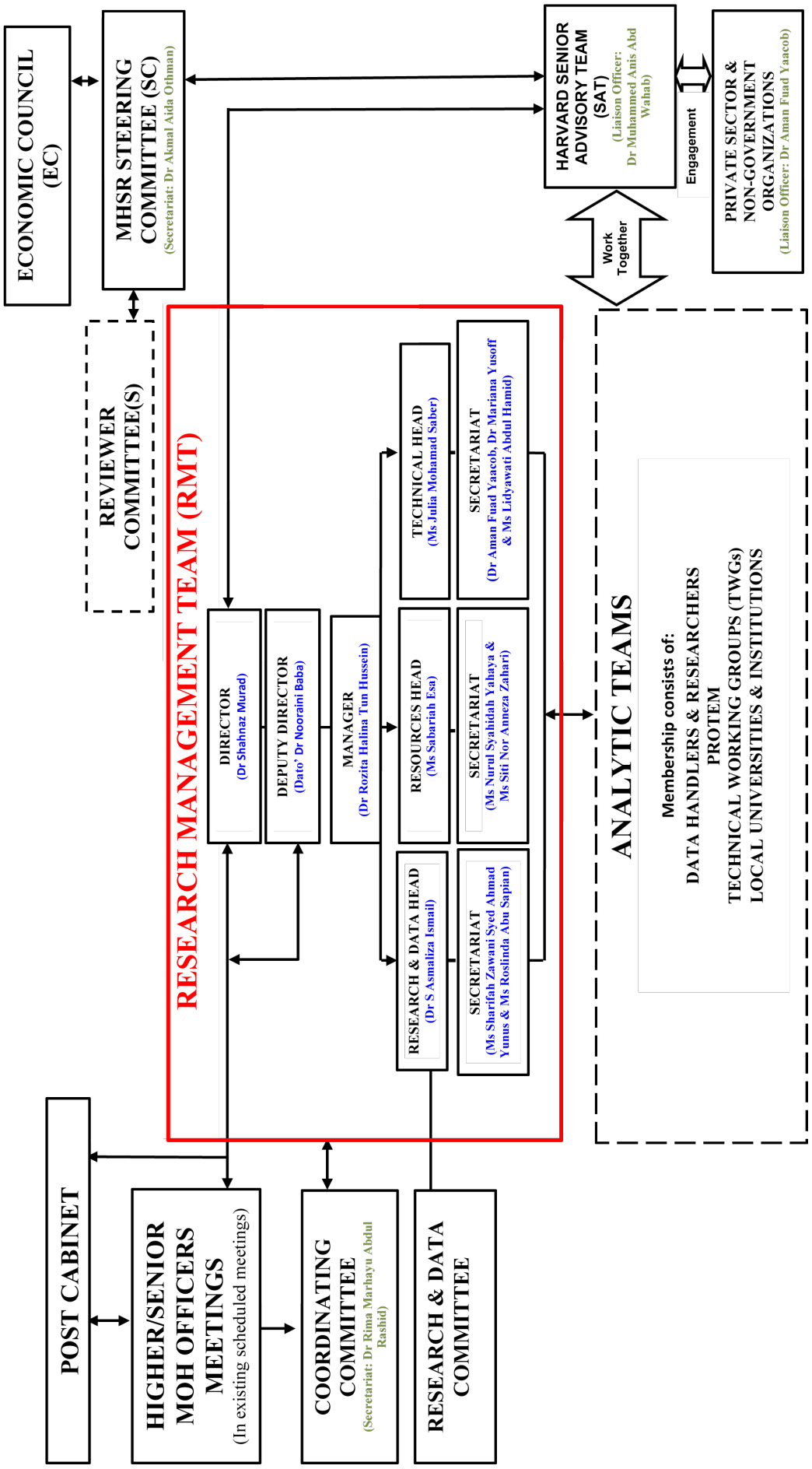


Figure A1.2. Malaysia Health Systems Research (MHSR): Team Malaysia Structure



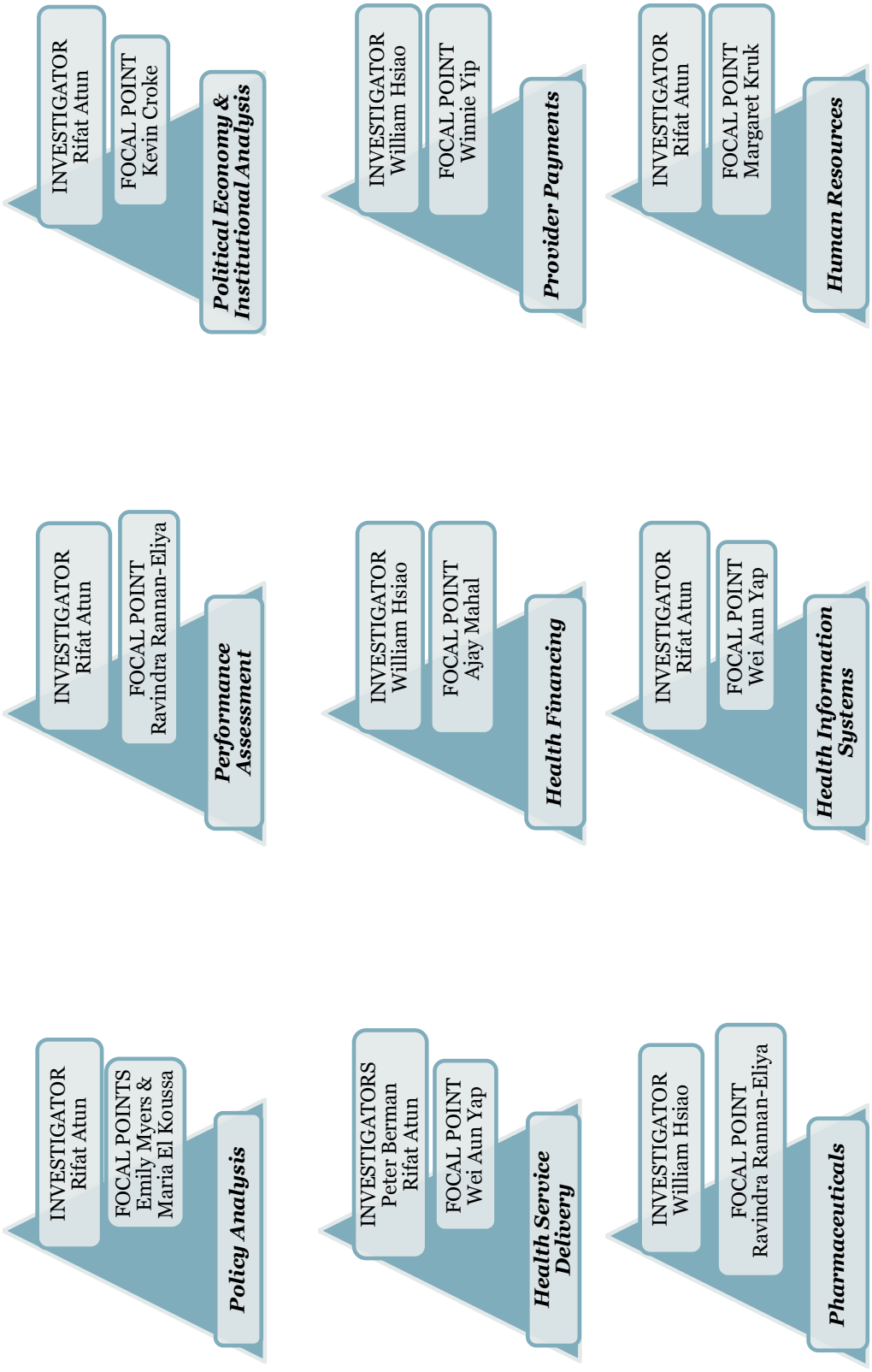
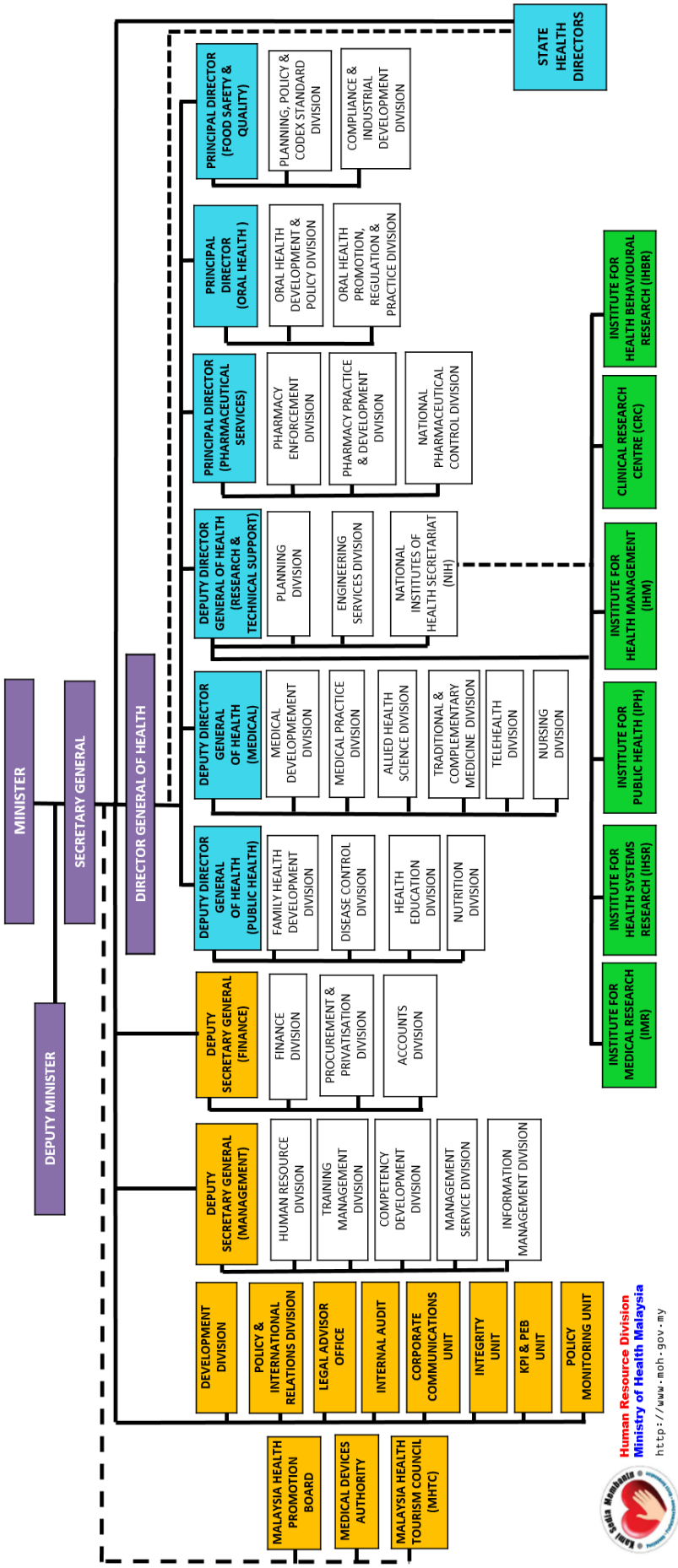


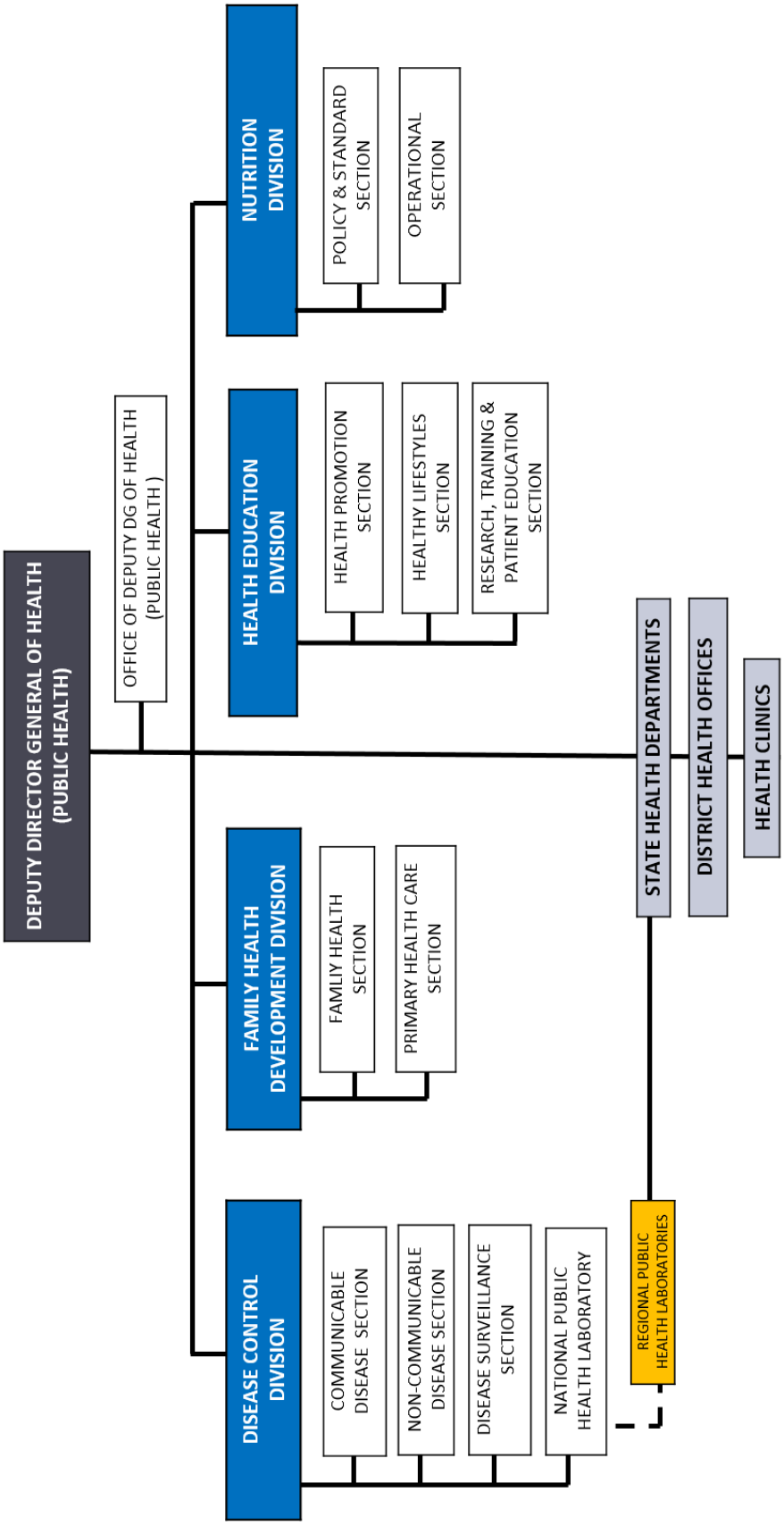
Figure A2.1. Malaysia Health Systems Research (MHSR): Harvard Team Investigators and Focal Points

Figure A2.2. 'Central' Ministry of Health Organizational Chart



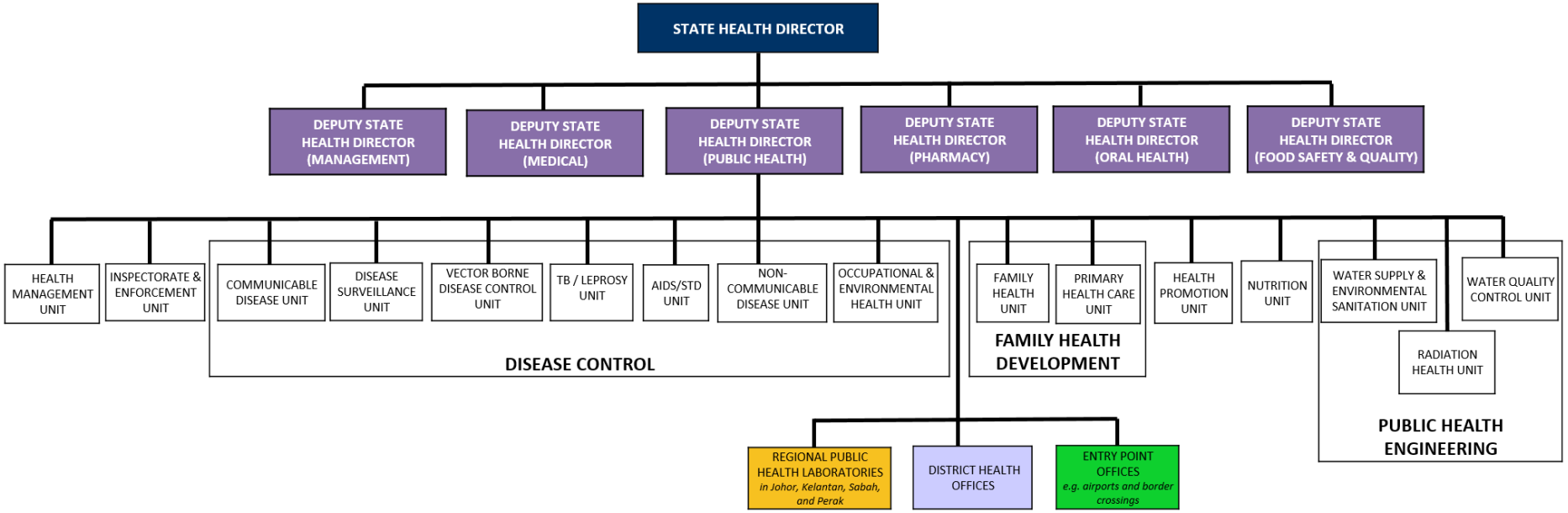
Source: MOH Malaysia

Figure A2.3. Organization of Public Health at the 'Central' Ministry of Health Level



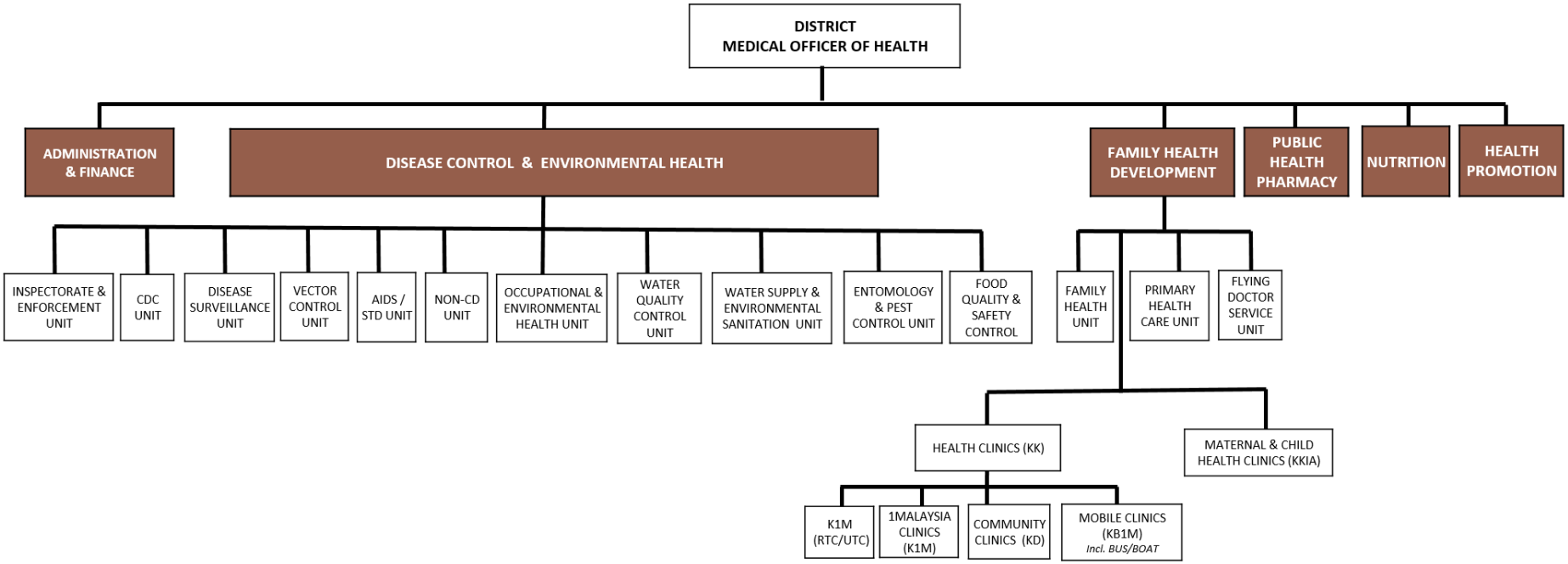
Source: Public Health Program, MOH Malaysia

Figure A2.4. Organization of Public Health at the State Level



Source: Public Health Program, MOH Malaysia

Figure A2.5. Organization of Public Health at the State Level



Source: Public Health Program, MOH Malaysia