

Resilient and people-centred health systems: Progress, challenges and future directions in Asia

Editors: Helena Legido-Quigley and Nima Asgari-Jirhandeh



Asia Pacific Observatory
on Health Systems and Policies



International Council
Yong Loo Lin School of Medicine



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Singapore Population Health Improvement Centre



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Foreword

It gives us great pleasure to introduce and recommend this book entitled “Resilient and people-centred health systems: progress, challenges and future directions in Asia”. It comes at an important time, as Asian countries are facing opportunities and challenges in designing and reforming their health systems in response to major epidemiological, demographic, ecological and economic transitions occurring across the region.

The book’s Introduction highlights the great diversity among and within countries in Asia, with many differences in governance, geography, climate, economy and cultural heritage. The focus of the book is on those Asian countries that belong to the South-East Asia and the Western Pacific Regions of WHO. The authors propose that although health systems are diverse throughout both regions, there are both threats and opportunities that all the countries have in common. This book therefore explores health systems’ progress, challenges, and present and future opportunities for improvement in these two regions and their subregions.

The first part of the book examines cross-national themes and the second part provides evidence in the form of case studies from a selection of countries comprising large (Indonesia) and small countries (Singapore); high- (Japan), upper-middle- (Thailand, Philippines) and lower-middle-income economies (Cambodia and Sri Lanka); and those with both weak and strong health systems.

The health system concept adopted in the book is based on the WHO definition and corresponding building blocks, covering major functions of the health system such as financing, service delivery, human resources and governance. However, we fully welcome the authors’ explicit recognition of wider socioeconomic factors and other essential requirements of health systems, such as people-centredness, resilience and quality of health care, elements which cut across multiple building blocks. A recurring theme of the book is that people should be at the centre of the health system. People-centred health systems promote equity, compassion, dignity, respect, equality, trust and communication. Strong patient and community

involvement is advocated, especially emphasizing the importance of vulnerable groups such as migrant populations.

Moreover, the authors focus on resilience as a vital factor for health systems to respond to unexpected shocks as well as to ensure continuity in health improvement and strengthening of the system. The book discusses the key functions required for facing present and future health challenges in Asia, such as human-induced and natural disasters, noncommunicable and communicable diseases, unforeseen outbreaks, urbanization and climate change. Resilient health systems need correct information, sufficient financing and human resources to face unexpected and ongoing threats. In addition, the authors identify quality of health care as an important factor in all the countries and regions under study, essential for ensuring that UHC delivers health gains, as well as access to services and financial protection.

The book addresses broader debates such as the need to promote an inclusive Universal Health Coverage (UHC) strategy within the Sustainable Development Agenda. It also focuses on exploring regional collaboration for health, using the Association of Southeast Asian Nations (ASEAN) as an example. Furthermore, the book introduces new global health debates such as engaging with the concept of planetary health and what it means for Asia, particularly on how we can start to build a future that will protect life within our biosphere as a human civilization.

The book concludes with an assessment of the achievements in managing successful health system reforms across Asia. The authors conclude that, while much has been achieved in improving health in the region, particularly with the advancement of UHC, much still needs to be done in an increasingly politically and economically complex context.

This book is a result of collaboration between the Asia Pacific Observatory on Health Systems and Policies as well as the National University of Singapore Medicine International Council and the National University Health System in Singapore. We are particularly pleased to see such important collaborations in the region with such wide-ranging expertise. This book has been authored by 45 international, regional and national health systems' experts based in 13 countries. The editors wanted to ensure

a multidisciplinary team working both in academia and government, with a balance between countries and regions, between senior and outstanding junior researchers, and promoting a gender balance among authors.

We hope this publication will serve as a catalyst for future collaboration among various institutions in Asia. This book presents an important opportunity to strengthen regional cooperation and improve global health capacities in the region. We believe this book will be a resource for policy stakeholders, academics, students and practitioners throughout and beyond Asia, and will provide better insight and evidence for enhancing policy decisions – ultimately to help advance the health and well-being of Asia's population.

Chong Yap Seng, Dean Designate of the Yong Loo Lin School of Medicine, National University of Singapore

Teo Yik Ying, Dean, Saw Swee Hock School of Public Health, National University of Singapore

Kara Hanson, Dean, Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine

Mario C Villaverde, Chair of the APO Board

John Eu-Li Wong, Senior Vice President (Health Affairs), National University of Singapore and Chief Executive, National University Health System

Peter Piot, Director, London School of Hygiene and Tropical Medicine

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Finally, we are grateful to our co-authors; without their dedication and enthusiasm, the book would have not been possible.

Author team

Editors

Helena Legido-Quigley, Associate Professor, Saw Swee Hock School of Public Health, National University of Singapore

Nima Asgari-Jirhandeh, Director, Asia-Pacific Observatory on Health Systems and Policies, WHO South-East Asia Regional Office, New Delhi, India

Chapter 1: Governing complexity: The regional health architecture in Asia

Julia Spencer, London School of Hygiene and Tropical Medicine, United Kingdom

Marco Liverani, London School of Hygiene and Tropical Medicine, United Kingdom; Faculty of Public Health, Mahidol University, Thailand.

Renzo Guinto, Harvard TH Chan School of Public Health, Boston, United States of America

Johanna Hanefeld, London School of Hygiene and Tropical Medicine, United Kingdom

Tikki Pangestu, Lee Kuan Yew School of Public Policy, National University of Singapore

Viroj Tangcharoensathien, International Health Policy Program, Ministry of Public Health, Thailand

Helena Legido-Quigley, Saw Swee Hock School of Public Health, National University of Singapore

Chapter 2: Planetary health and resilience in Asia

Selina Lo, School of Public Health, Faculty of Medicine and Health, University of Sydney, Australia

Katrina Lyne, Independent Consultant, Adelaide, Australia

Emily Y Chan, JC School of Public Health and Primary Care, The Chinese University of Hong Kong, Hong Kong SAR, China

Anthony Capon, School of Public Health, Faculty of Medicine and Health, University of Sydney, Australia

Chapter 3: Addressing NCDs in Asia through a health systems lens: Major challenges and the way forward

Melisa Mei Jin Tan, Saw Swee Hock School of Public Health, National University of Singapore

Victoria Elizabeth Haldane, Saw Swee Hock School of Public Health, National University of Singapore

Sue-Anne Toh, Yong Loo Lin School of Medicine, National University of Singapore

Martin McKee, London School of Hygiene and Tropical Medicine, United Kingdom

Helena Legido-Quigley, Saw Swee Hock School of Public Health, National University of Singapore

Chapter 4: Health systems barriers to controlling infectious diseases in low and middle income Asian countries

Mishal Sameer Khan, London School of Hygiene and Tropical Medicine, United Kingdom

Sonia Rego, London School of Hygiene and Tropical Medicine, United Kingdom

Shishi Wu, Saw Swee Hock School of Public Health, National University of Singapore

Nima Asgari-Jirhandeh, WHO South-East Asia Regional Office, New Delhi, India

Richard James Coker, London School of Hygiene and Tropical Medicine, United Kingdom.

David L Heymann, London School of Hygiene and Tropical Medicine, United Kingdom

Helena Legido-Quigley, Saw Swee Hock School of Public Health, National University of Singapore

Chapter 5: Cambodia

Krishna Hort, Nossal Institute for Global Health, School of Population and Global Health, The University of Melbourne, Australia

Por Ir, National Institute of Public Health, Cambodia

Keovathanak Khim, Independent Consultant, Phnom Penh, Cambodia

Peter Leslie Annear, Nossal Institute for Global Health, School of Population and Global Health, The University of Melbourne, Australia

Chapter 6: Indonesia

Yodi Mahendradhata, Department of Health Policy and Management, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia

Tiara Marthias, Department of Health Policy and Management, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia

Laksono Trisnantoro, Department of Health Policy and Management, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia

Chapter 7: Japan

Haruka Sakamoto, School of Public Health, University of Tokyo, Japan

Cyrus Ghaznavi, Graduate School of Medicine, University of Tokyo, Japan

Kenji Shibuya, Graduate School of Medicine, University of Tokyo, Japan

Chapter 8: Singapore

Joanne Yoong, Center for Economic and Social Research, University of Southern California

Wei Yen Lim, Department of Clinical Epidemiology, Tan Tock Seng Hospital, Singapore

Lydia Lin, Saw Swee Hock School of Public Health, National University of Singapore

Chapter 9: Sri Lanka

Palitha Abeykoon, Ministry of Health, Nutrition and Indigenous Medicine, Sri Lanka

Lalini Chandika Rajapaksa, Formerly with Faculty of Medicine, University of Colombo, Sri Lanka

Sudirikku Hennadige Padmal de Silva, Ministry of Health, Nutrition and Indigenous Medicine, Sri Lanka

Chapter 10: Thailand

Walaiporn Patcharanarumol, International Health Policy Program, Ministry of Public Health, Thailand

Suladda Pongutta, International Health Policy Program, Ministry of Public Health, Thailand

Woranan Witthayapipopsakul, International Health Policy Program, Ministry of Public Health, Thailand

Shaheda Viriyathorn, International Health Policy Program, Ministry of Public Health, Thailand

Viroj Tangcharoensathien, International Health Policy Program, Ministry of Public Health, Thailand

Chapter 11: The Philippines

Manuel M Dayrit, Ateneo School of Medicine and Public Health, Philippines

Elvira SN Dayrit, Formerly of Department of Health, Philippines

Jeremie De Guzman, Center for Health Evidence, Action, and Leadership, Ateneo School of Medicine and Public Health, Philippines

Geminn Louis C Apostol, Center for Health Evidence, Action, and Leadership, Ateneo School of Medicine and Public Health, Philippines

Acronyms and abbreviations

ACSC	ambulatory care-sensitive conditions
ACT	artemisinin-based combination therapy
ADB	Asian Development Bank
AIDS	acquired immune deficiency syndrome
AJS	acute jaundice syndrome
AMI	acute myocardial infarction
AMR	antimicrobial resistance
ANSORP	Asian Network for Surveillance of Resistant Pathogens
APEC	Asia Pacific Economic Cooperation
APLMA	Asia Pacific Leadership Malaria Alliance
APO	Asia Pacific Observatory on Health Systems and Policies
ARI	acute respiratory infection
ART	antiretroviral therapy
ARV	antiretroviral
ASCC	ASEAN Socio-Cultural Community
ASEAN	Association of Southeast Asian Nations
BLU	<i>Badan Layanan Umum</i> or public service entity (Indonesia)
BMI	body mass index
BRICS	Brazil, Russia, India, China and South Africa
CBHI	community-based health insurance
CHW	community health worker
CI	confidence interval
COBRA-BPS	control of blood pressure and risk attenuation
COPD	chronic obstructive pulmonary disease
CPA	complementary package of activities
CSMBS	Civil Servant Medical Benefit Scheme (Thailand)
CSO	civil society organization
CVD	cardiovascular disease

DAC	Development Assistance Committee
DAH	Development Assistance for Health (the Philippines)
DALY	disability-adjusted life year
DDC	Department of Disease Control (Thailand)
DDF	Department of Drugs and Food
DFAT	Department of Foreign Affairs and Trade
DfID	Department for International Development
DHF	dengue haemorrhagic fever
DHO	district health office
DoH	Department of Health
DOT	directly observed treatment
DOTS	directly observed treatment, short-course
DPT	diphtheria–tetanus–pertussis
EMR	electronic medical record
EU	European Union
FAO	Food and Agriculture Organization
FCTC	Framework Convention on Tobacco Control
FETP	Field Epidemiology Training Programme
GATS	Global Adult Tobacco Survey
GBD	Global Burden of Disease
GDP	gross domestic product
GGHI	Global Green and Healthy Hospitals Initiative
GHIT	Global Health Innovative Technology
GHSA	Global Health Security Agenda
GIDA	geographically isolated and disadvantaged areas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GMS	Greater Mekong Subregion
GNI	gross national income
H-EQIP	Health Equity and Quality Improvement Project

Acronyms and abbreviations

HAQ	Healthcare Access and Quality (Index)
HC	health centre
HCP	health-care provider
HEF	Health Equity Fund
Hib	<i>Haemophilus influenzae</i> type b
HICs	high-income countries
HITAP	Health Intervention and Technology Assessment Program (Thailand)
HIV	human immunodeficiency virus
HP	health post
HPV	human papillomavirus
HRH	human resources for health
HTA	health technology assessment
ICCS	Integrated Community Care System
ICT	information and communication technology
IDSC	Infectious Disease Surveillance Center
IFLS	Indonesian Family Life Survey
IHD	ischaemic heart disease
IHME	Institute for Human Metrics and Evaluation
IHPP	Thailand's International Health Policy Program
IHR	International Health Regulations
ILTC	intermediate- and long-term care
IMR	infant mortality rate
INA-CBG	Indonesia Case Based Group
IPCC	Intergovernmental Panel on Climate Change
IPV	inactivated polio vaccine
IT	information technology
JAPI	Joint Appraisal and Planning Initiative
JEE	joint external evaluation
JICA	Japan International Cooperation Agency
JKN	Jaminan Kesehatan Nasional (Indonesia)

JLN	Joint Learning Network on Universal Health Coverage
JVP	Janatha Vimukhti Peramuna (Sri Lanka)
KOICA	Korea International Cooperation Agency
LDP	Liberal Democratic Party of Japan
LF	lymphatic filariasis
LGU	local government unit
LHW	lady health worker
LMICs	low- and middle-income countries
MBDS	Mekong Basin Disease Surveillance
MCH	maternal and child health
MCP	medical care plan
MDGs	Millennium Development Goals
MDR	multidrug resistant
MECIDS	Middle East Consortium on Infectious Disease Surveillance
MERS-CoV	Middle East respiratory syndrome coronavirus
MHLW	Ministry of Health, Labour and Welfare
MMR	maternal mortality ratio
MNCH	maternal, neonatal and child health
MoH	Ministry of Health
MoHH	MoH Holdings (Singapore)
MoPH	Ministry of Public Health (Thailand)
MPA	minimum package of activities
MRA	Mutual Recognition Arrangement
MSM	men who have sex with men
NAP	national adaptation plan
NAPA	national adaptation programme of action
NBB	no-balance billing
NCD	noncommunicable disease
NCR	National Capital Region
NDB	New Development Bank

Acronyms and abbreviations

NGO	nongovernmental organization
NHA	National Health Assembly (Thailand)
NHI	National Health Insurance
NHIP	National Health Insurance Program
NHS	National Health Service
NHSO	National Health Security Office (Thailand)
NHTS-PR	National Household Targeting System for Poverty Reduction
NMR	neonatal mortality rate
NSPPF	National Social Security Policy Framework
NSSF	national social security fund
NTD	neglected tropical disease
NUH	National University Hospital (Singapore)
OD	operational district (Cambodia)
ODA	official development assistance
OECD	Organization for Economic Cooperation and Development
OOP	out of pocket (expenditure)
OR	odds ratio
OSDD	Open Source Drug Discovery (India)
PAE	Public Administrative Enterprise
PAHO	Pan American Health Organization
PHD	provincial health department
PHE	Public Health England
PHFI	Public Health Foundation of India
PhilHealth	Philippine Health Insurance Corporation
PHO	provincial health office (Thailand)
PM	particulate matter
PMTCT	prevention of mother-to-child transmission
PPP	public-private partnership
PSA	Philippine Statistical Authority
PSI	Population Services International

PURE	Prospective Urban and Rural Epidemiology (study)
RR	rifampicin resistant
SAARC	South Asian Association for Regional Cooperation
SAPA	Solidarity for Asian People’s Advocacy
SARS	severe acute respiratory syndrome
SDAH	Sector Development Approach for Health (the Philippines)
SDGs	Sustainable Development Goals
SHCSHG	specific health check-ups and specific health guidance
SHI	Social Health Insurance scheme (Thailand)/Philippines
SIKDA	Sistem Informasikesehatan daerah (district-level health information system)
SIKNAS	Sistem Informasikesehatan nasional (national health information system)
SOA	special operating agency
SQH	Sun Quality Health (Myanmar)
STEPS	WHO STEPwise approach to surveillance of NCDs
STH	soil-transmitted helminth
STI	sexually transmitted infection
SWAp	sector-wide approach
TAO	tambon (subdistrict) administration organization (Thailand)
TB	tuberculosis
ThaiHealth	Thai Health Promotion Foundation
THE	total health expenditure
TICA	Thailand International Cooperation Agency
TWG-H	Technical Working Group for Health
UCS	Universal Coverage Scheme (Thailand)
UHC	universal health coverage
UK	United Kingdom
UN	United Nations
UN OCHA	UN Office for the Coordination of Humanitarian Affairs
UNDP	United Nations Development Programme

Acronyms and abbreviations

UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNHCR	The United Nations Refugee Agency
UNICEF	United Nations Children’s Fund
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
URTI	upper respiratory tract infection
USA	United States of America
USAID	United States Agency for International Development
VWO	voluntary welfare organization
WASH	water, sanitation and hygiene
WHO	World Health Organization
WTO	World Trade Organization
WWF	World-Wide Fund for Nature
YLD	years lost due to disability
YLL	years of life lost (due to premature mortality)

Executive summary

Aim of the book

Asia comprises diverse countries, with a variety of government systems, economies, cultures, ethnic groups, geographies and climates. In spite of the varying nature of Asian countries and their health systems, this book highlights future opportunities and threats that they all have in common. The central aim of this book is to build a strong and robust evidence base that can be of assistance in developing local expertise in health systems, and generate innovative and effective solutions to enhance health systems in Asia.

Structure of the book

Introduction. The book opens with a brief explanation of the contextual factors affecting health systems in Asia; it continues with a description of the conceptual framework adopted, and then introduces each of the chapters. The introduction also defines the geographical scope of the book, which focuses on countries in the World Health Organization (WHO) South-East Asia and Western Pacific Regions.

Cross-national chapters. The book then provides an overview of four cross-national themes described in four chapters. These include: (1) regional governance for health; (2) planetary health; (3) health systems' facilitators of and barriers to the management of noncommunicable and (4) communicable and infectious diseases.

Country chapters. The book subsequently presents health system profiles from a selection of countries. Indonesia, Sri Lanka and Thailand were chosen from the South-East Asia Region and Cambodia, Japan, Singapore and the Philippines from the Western Pacific Region. The purpose of choosing such diverse countries was to include large countries and small ones, a combination of high-income, upper-middle-income and lower-middle-income economies, as well as those with strong and weak health systems.

Conclusions and future directions. Based on the evidence assembled, the book concludes by summarizing the main findings and proposes certain activities that are needed for developing strong, resilient and responsive health systems across Asia, irrespective of the political economy in each country.

Conceptual framework

This book follows a wide-ranging conceptualization of a health system, acknowledging that health systems do not easily fit into boxes but are complex, multilayered adaptive systems. We define a health system following the WHO acceptance, while supporting a more explicit recognition of the wider socioeconomic factors and other determinants of health, using a systems perspective. In order to better understand the ways in which health systems respond to demand, it is necessary to assess their performance. This book measures performance along three elements:

People-centredness recognizes the importance of people, processes, systems, power relations and values. People-centred health systems promote collaborative action to strengthen the autonomy of the person receiving services, acknowledging that power relations need to be reshaped to give greater autonomy and participation to those receiving health care. People-centredness is also an important component to help advance Universal Health Coverage (UHC) in Asia, and should include dimensions such as equity, dignity, respect, trust and communication.

Health systems resilience is primarily defined in this book as the health system's capacity to recover from and absorb shocks and sustain gains, but also to promote stronger health systems. Having the right health information systems, adequate financing mechanisms, appropriate human resources, and the right "governance" and "values" are key for a health system to be "resilient". The different chapters in the book discuss these key functions in relation to emerging health challenges faced by Asian countries, including unforeseen outbreaks, NCDs and ageing populations, and the effects of climate change.

Quality of health care is a major goal for all health systems in Asia. When exploring the systems in place for assuring the quality of health

care, we focus on policies operating at the health system level (i.e. national legislation and regulation, patient safety, health technology assessment [HTA] and training of professionals) at an organizational level (i.e. accreditation or peer visitation) and at a clinical level (i.e. clinical guidelines, quality indicators, patient surveys).

Summary of the findings: Cross-national chapters

Regional governance for health

- Regional cooperation for health in Asia has emerged in part due to a spirit of solidarity and a sense of shared vulnerability to common health threats, which has encouraged the development of regional public health networks and programmes.
- Despite substantial achievements in strengthening regional governance for health, differences between national health sectors, levels of political will and commitment, legal and regulatory environments, and health information systems pose significant challenges to regional health cooperation.
- Asia's health architecture is distinct from that of other regions, where approaches to cooperation are largely influenced by the principle of "non-interference" and health services have become an important and lucrative industry, with a proliferation of weakly regulated for-profit providers and an expanding market for medical technologies, trade in health services and medical tourism.
- Regional organizations such as the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC) are in a good position to promote regulatory convergence, and common rules and standards in collaboration with WHO and other global health agencies.

Planetary health

- Asia is undergoing a number of transitions – demographic, economic, epidemiological, urban, ecological, energy and nutritional.

- The transdisciplinary field of planetary health, namely, the health of human civilization and the natural systems on which it depends, offers an opportunity in which to address these transitions.
- Asia has a number of historical and current examples of best practice in planetary health, which can be shared with the world, e.g. Healthy Cities China, Japanese forest bathing and gardens.
- Asian universities, governments and society could consider scaling up existing efforts in planetary health across the region and continue to document robust examples.

Addressing noncommunicable diseases

- Prevention, treatment and management of NCDs demand a whole-of-society approach that should *include* governments, civil society, academia, industry and communities across a wide range of sectors to co-produce health.
- Health systems in Asia can deliver high-quality care only if they *invest* in the necessary resources and optimize their investment decisions. This includes having a sustainable and motivated health workforce, and using equitable and effective financing mechanisms to facilitate an appropriate focus on the prevention and control of NCDs. It also includes ensuring appropriate and accessible service delivery across the continuum of care, and *innovating* by introducing new ideas and implementing up-to-date interventions to meet the needs of all population groups, especially older and more vulnerable people. Strong, ambitious and effective leadership will be needed to ensure policy coherence of these components.
- In devising policies to tackle NCDs, countries must ensure that they have systems in place to safeguard health against powerful vested interests, particularly when engaging in public–private partnerships (PPPs).

- Asia's health systems must implement systems for prevention and care of NCDs that hold people-centredness at their core while ensuring resilience to withstand disruptive shocks.

Controlling infectious diseases

- Infectious diseases cause approximately 2 million deaths per year in Asia, and a large proportion of these deaths are avoidable.
- Weaknesses in health systems and other political and economic contexts in the region have meant that important preventive and curative measures to address infectious diseases are challenging to implement.
- Provision of good-quality, people-centred health services for the diverse range of infectious diseases affecting Asian populations relies on appropriate human resources to deliver care and medical products to enable front-line health professionals to work effectively, and information systems to monitor and share information in a timely manner. This in turn relies on adequate financing and governance systems.
- Owing to specific weaknesses across all the health systems elements mentioned above, there are impediments to routine early diagnosis and management of infectious diseases, which in turn results in ongoing spread. There are also major gaps in the resilience and preparedness of health systems to respond to outbreaks of infectious diseases. This area is receiving much attention under the remit of Global Health Security.
- To achieve long-term improvements in infectious disease control, weaknesses in the health system – which are not specific to any one infectious disease – need to be addressed using locally appropriate solutions. This will involve a shift away from strategies that are highly disease specific or issue specific. These disease-specific strategies could be used so that they become more inclusive of other infections with similar epidemiology.

Summary of the country chapters and activities needed across Asia

The country chapters highlight certain activities that are needed for strengthening health systems across Asia, irrespective of the type of health system or the political economy in each country:

An integrated health systems approach with primary health care at the forefront is needed to prevent and manage chronic conditions and to ensure continuing control of communicable and infectious diseases. A focus on primary health care does not mean disregarding the needs of the hospital sector, as changes in disease patterns will also increase acute episodes that need hospitalization. Integration of services, both horizontally and vertically, is required to improve quality and people-centeredness.

Many countries in Asia are focusing on strengthening primary health care. However, there are still many challenges ahead, such as ensuring that primary health care is comprehensive and integrated, avoiding duplication of activities, developing the right essential packages of services for primary health care both in urban and rural areas, and having the right staffing requirements.

A focus on sustainable financing is necessary to ensure that UHC is achieved across Asia. Most Asian countries have developed their own path for financing, aiming to improve equity and reduce out-of-pocket expenditure. As a result of pressures on the capacity and financial sustainability of health systems, Asian countries are developing new ways of collecting revenues and are designing new schemes to provide services for an ageing population and support those in difficulty. A neglected area that should also be adequately supported under UHC schemes is health promotion and disease prevention.

Finally, as a consequence of economic development, many countries in Asia are graduating away from external funding support. It is recommended that graduating countries plan and implement health-related programmes transitioning to local ownership with domestic funding sources.

Responsive health-care workforce is a fundamental requirement for delivering good-quality health care, which in turn translates into having

the right number of people, empowered to do the right thing at the right location, and at the right time. Challenges to having a responsive health-care workforce include the uneven distribution of the health workforce, insufficient cadre of health workers, inadequate training, and the unmet need for empowering doctors, nurses, midwives and pharmacists to go beyond their traditional roles.

Another key challenge is how to manage dual practice and its impact on availability of staff in the public sector. Overall, there is a need for an expanded cadre of health workers, deployed in a wide range of health facilities, where health-care professionals are treated with respect, rewarded appropriately for their work, and provided with training opportunities.

Addressing the health needs of vulnerable groups such as migrants and refugees. Asia hosts the largest group of refugees and some of the largest migrant and internally displaced populations in the world. To underscore the importance of vulnerable groups within the region, we have paid special attention in this book to migrants' health needs and have explored numerous barriers to accessing services in the different cross-national chapters.

Countries in Asia have acknowledged the need to work collaboratively in devising sustainable approaches to addressing regular and irregular migratory movements, and the influx of asylum-seekers and refugees. However, much remains to be understood about the health needs of these vulnerable populations and the ways in which the various health systems can address health inequities and other social, economic and political determinants of health.

Using new technologies. New technologies, understood as the processes that reinvigorate and integrate health systems as a whole, have a fundamental role to play in the future of the health sector.

There are many examples of the use of m-health and e-health in the region. These include established work such as outreach for health promotion, logistical support for medicine stock-outs, sending electronic reminders for routine outpatient appointments, and the use of HTA to introduce new

treatments and procedures. Ongoing experimentation includes the use of patient-held electronic medical records, linking patient records across various providers and remote interpretation of investigations, currently done by specialists but moving rapidly towards automation by the use of artificial intelligence algorithms. However, an area where scant attention is paid is the use of big data for planning and forecasting.

Multisectoral nature of health. To mitigate the future consequences of current development policies, a more collective, multisectoral approach is needed. The book identifies some activities that are already taking place in the region such as the National Health Assembly in Thailand that has been working across sectors, including the public and private sectors, academia and civil society, adopting a “Health in All Policies” philosophy.

When discussing multisectorality, it needs to be acknowledged that the private for-profit sector is an important heterogeneous industry that provides services at all levels of the health system alongside the public sector. The for-profit private sector is weakly regulated in Asia. Across the book it has been argued that regulation should seek to ensure that service provision within the private for-profit sector is equitable and, if possible, aligned to public sector strategies.

Looking into the future

In this book, we have provided many examples of innovative, people-centred and resilient activities taking place across the region. However, health systems in Asia are facing many challenges and much more needs to be done to design health systems of the future, in view of the ecological, epidemiological, demographic, economic, urban and nutritional transitions that are affecting Asian countries.

While we acknowledge that health systems need to find context-specific solutions to address their specific needs, we have identified certain activities that could be beneficial for all health systems. This includes a motivated and well-trained health workforce, a focus on sustainable and equitable financing, an integrated health systems approach with primary health care at the forefront, and adopting new technologies, products and information systems to reinvigorate and integrate health systems as a whole. Countries

in Asia will have to work collaboratively in devising sustainable and multisectoral approaches. Overall, addressing population health, including the social, political and commercial determinants of health, demand a whole-of-society approach that should include governments, civil society, academia, industry and communities across a wide range of sectors.

People-centred and resilient health systems in Asia: An introduction

Helena Legido-Quigley and Nima Asgari-Jirhandeh



Background

With an estimated population of over 4.4 billion (United Nations, 2017), Asia comprises widely diverse countries, with a variety of government systems, economies, cultures, ethnic groups, geographies and climates. Geographically, there is a diversity of terrains, varying between vast coastal plains, high plateaus and hills, deserts, mountainous regions and territories with some of the largest archipelagos. The climate of Asia is also heterogeneous and tends to be dry across the interior and mostly wet with heavy rainfall across the south-east regions. China, Japan, the Philippines and Viet Nam are the most active places for tropical cyclone activity in the region (FAO, 2003). Across the continent, there are numerous natural hazards linked to the different climates and tectonic plates. As a result, the region is vulnerable to natural and anthropogenic disasters such as earthquakes, air pollution, volcanic eruptions, typhoons, floods and tsunamis, particularly in South-East Asia (Chongsuvivatwong et al., 2011). The economies of Asia are also diverse, with some of the world's largest economies (i.e. China, India, Indonesia and Japan), the newly industrialized and high-income economies of East Asia (i.e. Singapore), and some less economically developed nations (i.e. Cambodia). Taken as a whole, Asia is the fastest-growing economy in the world. Asia also has a diverse and rich history and cultural heritage, being home to some of the world's earliest known civilizations such as the Ancient Chinese civilization, which emerged in the Yellow River region around 1500 BCE and the Indus Valley Civilization established during the Bronze Age in India.

Against this backdrop, Asia offers a diverse landscape to examine its health systems. The purpose of this book is to show that in spite of the varying nature of countries and health systems in Asia, there are threats and future opportunities that they all have in common, particularly in subregional contexts (Chongsuvivatwong et al., 2011). For example, geographical areas in East and South-East Asia have been particularly vulnerable to severe acute respiratory syndrome (SARS) and highly pathogenic avian influenza H5N1 as was evidenced during the SARS and H5N1 outbreaks in 2003 and 2004, respectively (Thomas, 2006). This book explores the progress, challenges and opportunities experienced by health systems in Asia and in their subregional context, with a focus on people-centredness, quality

of health care, and the need for developing resilience while following a multisectoral and systems approach. It forms part of a collaboration with the International Council of the National University of Singapore (NUS), the National University Health Systems in Singapore and the WHO Asia Pacific Observatory on Health Systems and Policies. The contributors to this book are drawn from an extensive network of health systems' experts, both globally and regionally.

For the purpose of this book, we refer to Asian countries as those categorized by the United Nations (United Nations, 2017). However, it would have been impossible to include all the countries in one volume. Hence, we agreed to focus on countries belonging to the WHO Western Pacific Region and the South-East Region, which account for 48 countries, territories and areas. The first part of the book discusses cross-national themes from both regions, while the second part focuses on country health system profiles from a selection of countries. Cambodia, Japan, Philippines and Singapore were chosen from the Western Pacific Region and Indonesia, Sri Lanka and Thailand from the South-East Asia Region. The purpose of choosing such diverse countries was to include large countries (such as Indonesia with 264 million people) and small ones (such as Singapore with just over 5 million), a combination of high-income (i.e. Japan, Singapore), upper-middle-income (i.e. Thailand and the Philippines) and lower-middle-income (i.e. Cambodia and Indonesia) economies, and a combination of strong and weak health systems.

Conceptual framework

This book adopts key concepts and constructs from the health systems field. Health systems research is an interdisciplinary field that brings together diverse disciplines, including economics, sociology, behavioural sciences, political science, public health and epidemiology, and seeks to understand how societies organize themselves to achieve common health goals (Gilson, 2012). This book follows a comprehensive and wide-ranging conceptualization of a health system, acknowledging that health systems do not easily fit into boxes but are complex, multilayered adaptive systems. We define a health system following the WHO acceptance, which states: "A health system consists of all organizations, people and actions whose

primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is therefore more than the pyramid of publicly owned facilities that deliver personal health services” (World Health Organization, 2007a). Following the WHO conceptualization of a health system, we support a more explicit recognition of the wider socioeconomic factors and other determinants of/requirements for health, which are beyond delivering health care to populations.

The case studies in this book have been organized according to a set of core functions of health systems, following an adapted version of the WHO building blocks framework (World Health Organization, 2007a). These include: people-centredness, governance, service delivery, management and provision of services, human and physical resources, and financing. People-centredness is the main element that is present in the selected framework while absent in the original WHO conceptualization of building blocks. Across the book we suggest that people are at the centre of the health system and people’s values in setting the principles of a health system are as equally important as structural factors and institutions. Furthermore, when describing the provision of services in the country case studies and cross-national themes, we use a systems perspective to provide an understanding of how health system building blocks, contexts and actors interact with each other, as a systems approach is an essential perspective in designing a well-functioning health system (de Savigny and Adam, 2009).

In order to better understand the ways in which health systems respond to the demand for services, it is necessary to assess their performance. This book measures performance along three elements: people-centredness, resilience and quality of health care. All country chapters reflect on these key elements and how each specific country is working towards incorporating them into their health systems. In addition, two of the cross-national chapters, which discuss health systems challenges to addressing noncommunicable diseases (NCDs) and infectious diseases, also include sections describing selected elements to provide an understanding of how diverse health systems perform in different contexts. The three elements considered essential for a well-performing health system are described below in more detail.

People-centredness

People-centredness recognizes the importance of people, processes, systems, power relations and values as foundational to any effort to improve health and well-being (Health Foundation, 2016). People-centred health systems acknowledge the different perspectives that actors bring to the health system, and promote collaborative action to strengthen the autonomy of the person receiving services (Health Foundation, 2016). Furthermore, a people-centred approach also acknowledges that power relations need to be reshaped to give greater autonomy and participation to those receiving health care. Key values of a people-centred health system include equity, compassion, dignity, respect and equality, as well as promoting trusting relationships and effective communication. It also incorporates the principles of coordinated care, effective primary health care, the influence of social norms and contexts, and responsiveness to the needs of people (WHO, 2007b). Key characteristics of people-centred systems include strong community involvement, and a chain of accountability throughout the system with community and patient engagement. Within this context, people-centredness is also an important component to help advance Universal Health Coverage (UHC) in Asia, since UHC needs to take into account power relations, values and social structures, and pay special attention to vulnerable groups that face multiple barriers to accessing services (Agyepong et al., 2018). To underscore the importance of vulnerable groups within the region, we have paid special attention to migrants' health needs and have explored numerous barriers to accessing services in the different cross-national chapters.

Health systems resilience

Building a resilient health system is fundamental to ensuring that health actors, institutions and populations are adequately prepared and are able to respond to unexpected shocks (Kruk et al., 2015). Resilience is an emerging concept in the health systems field, defined primarily as a health system's capacity to recover and absorb shocks and sustain gains, often measured through health outcomes (Haldane et al., 2017). Most experts in health systems resilience stress that the focus should not only be on absorbing the unforeseen shocks precipitated by emerging health needs, but also on ensuring continuity in health improvement as well as fostering

health systems strengthening (Haldane et al., 2017). With that aim in mind, Hanefeld et al. (2018) have identified three core dimensions corresponding to three health systems functions that need to be in place to assure resilient health systems before, during and after an unforeseen shock or crisis. These include having the right health information systems to make the right decisions; having the right financing mechanisms to mobilize the needed resources; and having the appropriate human resources. In addition, the authors identify “governance” and the “values” of those planning the response to a shock as two cross-cutting aspects that need to be present for a health system to be “resilient”. Overall, the authors conclude that it is key to have an integrated approach when planning and implementing a response, and take into account how this is experienced by both individuals and communities (Hanefeld et al., 2018). The different chapters in this book discuss these key functions in tackling the ongoing and emerging health challenges faced by Asian countries, including natural and human-induced disasters, NCDs among an ageing population, unforeseen outbreaks, urbanization and climate change, among others.

Quality of health care

Assuring the quality of health care is a major goal in all health systems worldwide, and specifically in Asia. The United States (US) Institute of Medicine defines quality as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (Institute of Medicine, 2001). The quality of health care also comprises several dimensions. The most commonly used dimensions to define the quality of health care, and those adopted in this book, include effectiveness, efficiency, access, safety, equity, appropriateness and patient responsiveness (Legido-Quigley et al., 2008). When exploring systems in place for assuring the quality of health care at system level, Legido-Quigley et al. (2008) propose a categorization of strategies that include the health system level, the organizational level and the clinical level. Policies operating at the health system level comprise national legislation and regulation, patient safety, registration and licensing of pharmaceuticals and medical devices, health technology assessment (HTA), and training and continuing education of professionals. At an organizational level, voluntary

and compulsory mechanisms exist to assure an adequate quality of health care such as accreditation or peer visitation. Clinical quality assessment schemes involve, among others, clinical guidelines, quality indicators, patient surveys, clinical governance and audit processes (Legido-Quigley et al., 2008). This book describes quality strategies as identified in the region and in each of the countries presented.

Book chapters

This book has two parts. The first part (Chapters 1–4) provides an overview of four cross-national themes, covering key areas and multisectoral issues affecting health systems in the region, such as an overview of key developments in regional governance for health; health systems barriers to and facilitators of the prevention and treatment of both NCDs and communicable and infectious diseases; and the notion of resilience and planetary health in relation to the Sustainable Development Goals (SDGs) and UHC.

In Chapter 1, **Spencer et al.** provide an overview of key developments in regional governance for health in Asia, with specific examples and case studies from different contexts and health sectors, including Cambodia, China, India, Japan, Thailand and the Philippines, among others. The chapter begins by introducing the regional context, highlighting that despite marked improvements in health indicators, many Asian countries still face significant challenges, particularly in the context of rapid demographic and epidemiological transitions, and the associated “double burden” of communicable diseases and NCDs (Baker et al., 2015; Chongsuvivatwong et al., 2011; Narain and Bhatia, 2010). Since these are important health threats across all countries, two separate chapters are devoted to discussing the health systems challenges of addressing NCDs (*see* Chapter 3) and communicable and infectious diseases (*see* Chapter 4), and progress, challenges and opportunities, as well as future directions.

The chapter then describes how this sense of shared vulnerability to common health threats and a spirit of solidarity have promoted health cooperation in the region, and provides an overview of the key groups of actors and frameworks that support collective action. It discusses the Association of Southeast Asian Nations (ASEAN) in particular to illustrate

institutional challenges and opportunities for regional cooperation. The case of communicable disease governance in Asia is then described to shed light on wider governance dynamics using infectious diseases as one of the policy tracers.

The chapter concludes by reminding us that regional governance for health remains a complex task that requires convergence between different health systems, as well as diverse political, cultural, legal, regulatory and economic arrangements. Looking into the future, the authors conclude that, given the rise in relevance of global health in Asia, actors throughout the region have a crucial opportunity to generate greater dialogue, synergies and commitment to regional governance for health, and to lead more firmly in the global health space.

In Chapter 2, **Lo et al.** explain through a planetary health and resilience lens how we can start to understand Asia's global health challenges but, most importantly, how we can start to build a future that will protect all life within our biosystems and biosphere as a human civilization. The objective of Chapter 2, as highlighted by the authors, consists of introducing the readers to the concept of planetary health as an emerging discipline to be engaged with in Asian contexts. The chapter, multisectoral and transdisciplinary in nature, focuses on South-East and East Asian countries, although generalizable reports are drawn from the Asia Pacific region. The authors start by exploring the general concept and origins of planetary health, and go on to describe some of the major transitions occurring in Asia (epidemiological and demographic, ecological, economic, energy, nutritional and urbanization). Lo et al. then look at the notion of resilience and systems, and briefly explore planetary health in relation to the SDGs and UHC, concepts and processes that are also discussed in other chapters of the book, as these are considered key within health systems research. The chapter continues with some examples of Asian planetary health initiatives. These include, among others, Healthy Cities China, Japanese forest bathing and gardens, and the Global Green and Healthy Hospitals Initiative (GGHI) taking place in China, Indonesia, Nepal and Philippines. Lo et al. acknowledge that challenges posed by these Asian transitions will require different intersectoral approaches and political leadership willing to build for future generations. The chapter also provides some

guiding recommendations to Asian universities, governments and society as a whole. Finally, the authors conclude that “it is up to Asia to provide regional solutions and local innovations drawing on both ancient practices and knowledge unique to the region, as well as facilitating the involvement of people in the future of their health and the natural environment that supports them”.

Chapter 3 discusses the challenges and opportunities driven by the escalating burden of NCDs, which threatens health and well-being in Asia. The chapter begins with an introduction presenting the regional context, and focuses on the opportunities for collaboration in managing NCDs regionally and nationally within Asia. **Tan et al.** acknowledge that Asian countries are in varying stages of demographic transition, but are all characterized by population ageing, resulting in profound repercussions for the complex management of NCDs. The authors also emphasize the need for health systems to be agile and adapt to the scale of migration within Asia.

The chapter summarizes how Asian countries leverage on the collaboration opportunities to tackle the challenges of NCDs. The authors highlight that NCDs are the leading causes of mortality in Asia, with more than half of the 40.5 million global NCDs deaths (i.e. 21 million) occurring in the WHO South-East Asia and WHO Western Pacific regions. The chapter describes the burden caused by NCDs for selected Asian countries (such as China, India and Thailand), and conditions (such as cardiovascular diseases, diabetes mellitus and mental health disorders) in terms of disability-adjusted life years (DALYs) and years lost due to disability (YLD), where relevant. Tan et al. further examine and discuss the varied ways in which health systems organize and deliver services. This section analyses national systems responses, drawing on the building blocks used in the WHO health systems framework. The chapter explores the diversity of health systems’ factors and offers insights into health systems’ performance through the elements of people-centredness, health systems resilience and quality of health care. The authors illustrate the three elements with a series of case studies such as insurance schemes for refugees in Thailand and Malaysia, which exemplify the innovative approaches used across the region in the prevention, treatment and management of NCDs.

The chapter concludes with a series of recommendations following a strategy centred around inclusion, investment and innovation. Looking into the future, Tan et al. suggest that equitable and quality care for the increasing burden of NCDs will require Asian countries to put into action whole-of-society approaches underpinned by strong governance mechanisms. The authors further acknowledge that Asian countries will need to ensure appropriate and affordable interventions to deliver a continuum of care beyond hospitals and towards community settings. Asian countries need to develop policies that forge inclusivity, implement methods that invest sustainably in resources and capital, and stimulate technologies through evidence and innovation. Finally, Tan et al. stress that when devising NCD policies, Asian countries must ensure that systems are in place to safeguard health against powerful vested interests. This is a key point that is relevant for other health conditions, and discussed in the other cross-cutting chapters, particularly when discussing public-private partnerships.

Chapter 4 focuses on health systems weaknesses that need to be addressed to better control infectious diseases in low- and middle-income Asian countries, including the 10 member countries of ASEAN. The authors illustrate their points with examples of prominent communicable disease challenges and solutions in China, India, Pakistan and Sri Lanka. The authors acknowledge that there is huge economic, geographical, cultural and political diversity across these countries, and draw out some common health systems challenges. The chapter begins with an introduction to the regional context focusing on the burden from infectious diseases in terms of DALYs and mortality. **Khan et al.** highlight that communicable diseases cause approximately 2 million deaths per year in Asia with tuberculosis (TB), sexually transmitted infections including HIV, and diarrhoeal diseases being the major causes of death in the continent. A key point made at the start of the chapter is that a large proportion of these deaths are avoidable when health systems are able to support critical preventive and curative measures.

Against this backdrop, Chapter 4 summarizes how weaknesses in key components of the health system impede progress in addressing infectious diseases in Asian LMICs. In this chapter, the impact of specific health

systems challenges on progress towards infectious disease control is illustrated using human immunodeficiency virus (HIV), TB, malaria, antimicrobial resistance (AMR) and avian influenza as case studies. The authors stress that owing to specific weakness across all the health systems elements, there are impediments to routine early diagnosis and management of infectious diseases, which in turn result in ongoing spread. Khan et al. also identify major gaps in resilience and preparedness of health systems to respond to outbreaks of infectious diseases. Common health system weaknesses that impede provision of high-quality, people-centred health services are discussed in terms of: human resources to deliver care, medical products to enable front-line health professionals to work effectively, and information systems to monitor and share information in a timely manner. The authors argue that improvements in these critical components of the health system also rely on adequate financing and governance systems. Finally, Khan et al. emphasize that long-term improvements in infectious disease control require that weaknesses in the health systems be addressed using locally appropriate solutions. This will involve a shift away from strategies that are highly disease specific; or to use these disease-specific strategies to become more inclusive of other infections with similar epidemiology.

The second part of the book contains descriptions of the health-care systems in each country based on the Health Systems in Transition country profiles published by the Asia Pacific Observatory of Health Systems and Policies (www.searo.who.int/asia_pacific_observatory). Four out of the seven selected countries belong to the Western Pacific Region (i.e. Cambodia, Japan, Philippines and Singapore) and three to the WHO South-East Asia Region (i.e. Indonesia, Sri Lanka and Thailand). All country case studies follow the same structure based on the conceptual framework described above. Each profile starts with an introduction describing the economic context, including socioeconomic indicators, the political context and concludes with a brief description of the natural and human-induced disasters faced by the country. The case studies then move on to describe the countries' population health status and explore risk factors focusing on tobacco use, diabetes and hypertension, among others. The main section of the case studies describes the core functions of health systems, focusing on their organization, patient-centredness, financing, physical and human resources,

and provision of services (including management of NCDs, communicable diseases, and maternal and child health [MCH]). The case studies also assess the performance of health systems, including effectiveness, quality, accessibility and resilience. Finally, the chapters conclude with future developments planned and major challenges ahead. Following the rationale for the book, within a context of diversity, the editors aim to provide a snapshot of diverse health systems, discussing their challenges and concluding with the progress made and looking into the future.

Finally, the Conclusion chapter summarizes the strategies adopted in Asian countries to develop a people-centred, resilient and quality oriented health system. It then moves on to highlight certain activities that are needed across Asia, irrespective of the type of health system or the political economy in each country. This include the need for a whole-of-system approach with primary health care at the forefront; developing a responsive health workforce; implementing sustainable financing; addressing the needs of vulnerable groups; promoting regional governance for health; and developing a multisectoral approach. The book concludes that while much progress has been made in advancing health and wellbeing in the region, much more needs to be done to design the health systems of the future.

The central purpose of this book is to build a strong and robust evidence base to contribute to creating health systems that are more people-centred, more resilient, of good quality and equitable for improved health outcomes. We also hope that this book will contribute to knowledge, be of assistance in developing local expertise in health systems, and generate innovative and effective solutions to enhance health systems in Asia.

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PART I

Chapter 1. Governing complexity: The regional health architecture in Asia

Julia Spencer, Marco Liverani, Renzo Guinto, Johanna Hanefeld, Tikki Pang,
Viroj Tangcharoensathien, Helena Legido-Quigley



1.1 Introduction

In today's increasingly globalized world – characterized by the extensive movement of people, goods and services, capital and ideas across national borders (Kruk, 2012) – a wide range of transborder health threats, such as emerging and re-emerging infectious diseases, rising rates of noncommunicable diseases (NCDs) and spreading antimicrobial resistance (AMR), emphasize the need for collective action to promote and protect population health (Lee, Pang and Tan, 2013; WHO, 2002). New forms of collaboration are particularly important given that the social, economic, political and commercial determinants of health reside outside of the health sector. Within this transnational and cross-cutting arena, the efforts of governments or other relevant actors to steer collective action to address health and its determinants through whole-of-government and whole-of-society approaches constitute “governance for health” (Kickbusch and Gleicher, 2012). In this context, governance is diffused from a State-centred model to a collaborative one, and is influenced by a wide array of State and non-State actors, at times with competing interests and different approaches (Kickbusch and Gleicher, 2012). Spanning across multiple sectors, from governmental to private for-profit organizations, these actors may operate at the global, regional, national or subnational level (Szlezák et al., 2010).

Governance for health at the regional level has the potential to enhance coherence across national health policies, to shape and coordinate broad multicountry health initiatives, and to align domestic needs with global commitments (Kickbusch and Szabo, 2014; Riggiozzi and Yeates, 2015; Yeates and Riggiozzi, 2015). In this regard, effective governance can harmonize the agendas of various stakeholders and coordinate their actions. These actors can also participate in global governance for health by, for instance, contributing to agenda-setting and shaping global norms (Kickbusch and Szabo, 2014). The process of regionalizing health cooperation – which we define as the establishment of formal or informal arrangements for public health cooperation at the regional level (Liverani, Hanvoravongchai and Coker, 2012; Riggiozzi and Yeates, 2015) – was influenced by the World Health Organization (WHO), which has operated through a decentralized system of six regional offices since its establishment in 1948.

Being home to more than half of the world's population, Asia presents a breadth of economic, political, social, cultural and geographical diversity both across and within countries, associated with different health and development challenges (Lee, Pang and Tan, 2013). Nonetheless, important public health concerns are shared across Asian countries, particularly in subregional contexts (Lamy and Phua, 2012a & 2012b; Liverani, Hanvoravongchai and Coker, 2012 & 2013; Nodzenski et al., 2016; Pang, 2016; Thomas, 2006). For example, geographical areas in East and South-East Asia have been particularly vulnerable to transnational health threats, such as severe acute respiratory syndrome (SARS), dengue and highly pathogenic avian influenza H5N1. This shared vulnerability has encouraged the development of regional surveillance and response programmes (Liverani, Hanvoravongchai and Coker, 2012). Furthermore, regional programmes for political and economic cooperation have provided the institutional bases from which public health programmes can be developed and implemented (Liverani, Hanvoravongchai and Coker, 2012). Examples of such institutional venues include the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC).

This chapter gives an overview of these developments in regional governance for health in Asia, with specific examples and case studies from different contexts and health sectors. The chapter begins with a broad introduction to the regional health architecture – which we define as the group of actors with a primary intent to improve health by addressing common threats in the region, and the governance, financing and delivery arrangements in which these actors operate (Hoffman, Cole and Pearcey, 2015) – describing the key groups of actors and examples of existing frameworks for regional health cooperation. In the first part of the chapter, the case of ASEAN is discussed in-depth to illustrate institutional challenges to, and opportunities for, regional cooperation in Asia. The case of communicable disease governance in Asia is then presented to shed light on the wider governance dynamics in the region using infectious diseases as one of the policy tracers. Key achievements of, opportunities for and challenges to governance for health in Asia are discussed, following which we comment on the potential for the region to engage in and contribute more broadly to global governance for health.

1.2 The need for collective action to manage transboundary health problems

Despite marked improvements in health indicators, many Asian countries face significant challenges, particularly in the context of rapid demographic and epidemiological transitions and the associated “double burden” of communicable diseases and NCDs, and an ageing population (Chongsuvivatwong et al., 2011; Narain and Bhatia, 2010; Nodzenski et al., 2016). Emerging and re-emerging infectious diseases are a key concern due to population movements, both intra- and cross-boundary, high-density urbanization and climate change, as are persisting inequalities in health outcomes (Chongsuvivatwong et al., 2011). Furthermore, the process of trade liberalization has seen the spread and growth of Asia’s tobacco, alcohol and ultra-processed food manufacturers, associated with an increase in risks to health throughout the region (Baker, Kay and Walls, 2015). For example, China has witnessed a rapid increase in per capita alcohol consumption, from approximately 3 litres of pure alcohol in 2004 to just under 5 litres in 2009, alongside a steady rise in the production of alcoholic beverages (Tang et al., 2013). Asia is also vulnerable to natural and anthropogenic disasters, particularly in the South-East region, such as earthquakes, typhoons, floods, as well as other problems that affect health such as environmental pollution (Chongsuvivatwong et al., 2011). In recognition of the transnational nature of these threats, mechanisms to promote regional health cooperation and coordination have been established. While regional governance mechanisms already existed for other areas of public policy in Asia, health emerged as a new item on the agendas of national authorities and international organizations, particularly following the SARS and H5N1 outbreaks in 2003 and 2004, respectively, which demonstrated that health threats can have severe impacts on economic growth and stability (Nodzenski et al., 2016). For example, the World Bank estimates that the 2003 SARS outbreak cost the global economy US\$ 54 billion (Jonas, 2013).

1.3 The regional health architecture

As discussed in the introduction, the regional health architecture consists of the actors who seek to address common health threats and their determinants in Asia, and the arrangements that shape their interactions

(Hoffman, Cole and Pearcey, 2015). In particular, central to the regional architecture are national governments (including ministries of health and other bodies such as ministries of finance), regional and non-regional donors, international organizations such as the WHO, civil society organizations (CSOs), private foundations, global health partnerships and for-profit private sector actors. There is, however, a lack of consensus among stakeholders as to how collective action to address transnational health problems should be supported and steered; indeed, regional health cooperation has been relatively limited in Asia as compared to, for example, the Americas with the Pan American Health Organization (PAHO) or Europe with the European Commission (Lee, 2013). In the following sections, we provide an overview of these different actors and their roles in regional governance for health.

1.3.1 WHO regional offices

WHO is central to the health architecture in Asia and its efforts are spearheaded by the Regional Office for South-East Asia, the Regional Office for the Western Pacific and the Regional Office for the Eastern Mediterranean. The regional offices are broadly composed of WHO Member States representing one geographical or cultural area; however, the particular composition of each region has changed over time as a result of historical political divisions between Member States (Fee, Cueto and Brown, 2016). For example, due to the enduring conflict between Pakistan and India, Pakistan joined the Regional Office for the Eastern Mediterranean despite its geographical proximity to the Regional Office for South-East Asia (Fee, Cueto and Brown, 2016). While carrying out much of WHO's programmatic work and ensuring coordination and coherence with the Organization's global policy objectives, the regional offices also maintain a certain autonomy, working according to their own health agendas through the resolutions and decisions of their respective regional committees (Youde, 2012). Although improved recently, cooperation between WHO regional offices had been a challenge in Asia due to the historical split of regional clusters into separate WHO regional offices soon after the Second World War. The division of offices and bureaucratic rigidity hindered regional collaboration and have contributed in part to fragmentation across health programmes (Chongsuvivatwong et al., 2011; Liverani,

Hanvoravongchai and Coker, 2012). Despite these challenges, the WHO regional offices play an important role in providing normative guidance and technical support to Member countries, as well as facilitating the formulation of policy and regulatory mechanisms in the region.

WHO also established the Asia Pacific Observatory on Health Systems and Policies (the APO) in 2011, a multisector partnership that is active in the region in terms of country-level policy development, health systems research and evidence generation, as well as strengthening of health systems capacity (APO, 2018). There are signs of growing regional cooperation around particular disease threats, such as pandemic influenza, focused on surveillance, monitoring and reporting (Lee, 2013). Indeed, the effective implementation of WHO's International Health Regulations (IHR) (2005), which require governments to build and strengthen their capacities to prevent, report and respond to public health risks of international concern, could also facilitate improved integration and coordination at the regional level in Asia (WHO, 2005).

1.3.2 ASEAN as an example of a regional health forum

Beyond national governments and WHO and its regional offices, the health architecture in Asia has seen a proliferation of actors from the health sector and beyond. In particular, health cooperation has featured on the agendas of several regional organizations in Asia, albeit to varying extents, including, for instance, the Asian Development Bank (ADB), the Asia Pacific Economic Cooperation (APEC) forum, SAARC, the Shanghai Cooperation Organization and ASEAN (Caballero-Anthony and Amul, 2014).

In South-East Asia, for example, ASEAN has emerged as a key institutional actor in the regional health architecture, with particular influence in convening national governments for negotiation and consensus-building for health (Nodzinski et al., 2016). Established in 1967 as a coalition of five countries in South-East Asia – Indonesia, Malaysia, Philippines, Singapore and Thailand – ASEAN aims to promote regional peace and stability, as well as political, economic and social cooperation among its members (ASEAN, n.d.-a). Since its establishment, the organization has progressively grown to include ten countries from South-East Asia, and has engaged deeply with neighbouring countries such as China, Japan and

the Republic of Korea in what is known as the ASEAN Plus Three process. While health was not a priority of ASEAN in the early history of this organization, after the SARS outbreak in 2003, public health has featured more prominently on ASEAN's agenda (Liverani, Hanvoravongchai and Coker, 2013). The 2007 ASEAN Charter was particularly influential in generating political momentum for public health as it established the Socio-Cultural Community (ASCC) pillar, which supports ASEAN's health-related programming (Nodzinski et al., 2016). However, regional health cooperation has largely focused on infectious diseases, whereas NCDs and health systems strengthening, for instance, have historically received less attention and fewer resources (Caballero-Anthony and Amul, 2014; Lamy and Phua, 2012).

Despite much promise for improved regional governance for health, previous ASEAN frameworks for health cooperation, such as the Strategic Framework on Health and Development (2010–2015), saw very few programmes being implemented on the ground (Lamy and Phua, 2012). Low-level institutionalization and a lack of funding (often with reliance on donor funding) and technical expertise are key barriers to effective collaboration across member states (Nodzinski et al., 2016). Indeed, without the necessary funding, other priority areas in the region, such as minimizing political conflict and maintaining regional stability (Lee, Pang and Tan, 2013), have tended to be prioritized (Liverani, Hanvoravongchai and Coker, 2012). Structural factors such as political diversity, economic inequalities and differences in operational capacity between ASEAN member countries are also barriers to effective health cooperation (Nodzinski et al., 2016). Finally, the principle of non-interference applied by the "Political and Security pillar", which is based on the primacy of State sovereignty, informs negotiations between member countries, recognition of which has led to the concept of the "ASEAN way", which involves a slow and complex decision-making process that operates by consensus (Liverani, Hanvoravongchai and Coker, 2013). Although these norms and practices can work to build trust among its members, when coupled with a lack of political integration and insufficient funding, they are thought to challenge cooperation and the design of regional health governance frameworks (Nodzinski et al., 2016).

Despite these challenges, ASEAN's re-organized Post-2015 Health Development Agenda – which was led by Thailand through a two-year negotiation aimed at improving performance of health collaboration and linking with global commitments to the 2030 Agenda for Sustainable Development – places ASEAN in a good position to take on a greater health leadership role in the region and globally. The new agenda also seeks to position its member countries in the broader global health space and to strengthen collaboration with non-regional countries and development partners (ASEAN, 2016). Moving away from a fragmented approach of more than 100 programmes and projects, the new regional health agenda is organized into four health clusters that provide strategic leadership to develop, implement, monitor and evaluate regional programmes with the aim of improved performance and effectiveness within their thematic focus areas: promoting healthy lifestyles, responding to all hazards and emerging threats, strengthening health systems and access to care, and ensuring food safety (ASEAN, 2016). Each regional project is coordinated by a lead country and co-led by another country with technical input solicited from other regional and global actors (ASEAN, n.d.-b). While non-legally binding, this new integrated governance framework may help improve health coordination and performance across member states horizontally by outlining joint health priorities and providing strategic leadership (ASEAN, n.d.-b). Progress is regularly reported to senior officials during the biannual meeting of Health Ministers. Of particular importance is the organization's recognition that health should be incorporated into all policies (ASEAN, 2016), which could encourage more policy coherence within the Socio-Cultural pillar as well as the other two pillars of the ASEAN community (Political-Security and Economic), and across initiatives in the region. At the same time, the new agenda may strengthen ASEAN's position as an intermediary between global normative frameworks such as the Sustainable Development Goals (SDGs) and national policy-making and implementation.

1.3.3 International partners

In addition to State cooperation in regional organizations such as ASEAN and the core roles of national governments and WHO throughout Asia, bilateral donors from outside of the region, such as the United States of

America (USA), Australia and the European Union (EU), have also engaged in regional cooperation. Multilateral institutions are another group of key players in the regional health architecture, such as the ADB, the Islamic Development Bank, the World Bank and the World Trade Organization (WTO). For example, the ADB has outlined health infrastructure, health governance and financing as key priority areas in their Operation Plan for Health 2015–2020, which they will support by investing in information and communications technology (ICT) and public–private partnerships (ADB, 2015).

Despite the participation of Asian stakeholders in some of these global institutions such as the WTO, researchers have argued that the region has not yet achieved the impact that it could (Fidler, 2010; Gostin, 2013; Yeling, Lee and Pang, 2012). For instance, Gostin (2013) argues that Asia could be “a global leader in fighting unfair trade rules that disadvantage the region and other resource-poor regions of the world”, while Asian institutions could capitalize on political and economic power in the region to promote more equitable international trade policy and arrangements, including South–South partnerships. For example, many Asian countries have pharmaceutical manufacturing capacity – such as China, India, Indonesia, Japan, Pakistan and Thailand – which uniquely positions the region (outside of Europe and the USA) in negotiations surrounding issues of access to medicines and intellectual property rights (Gostin, 2013; Moon and Szlezák, 2013; Smith, Correa and Oh 2009). Indeed, India has emerged as a world leader in this regard as a low-priced supplier of generic medicines. The value of pharmaceutical exports from India was US\$ 17.27 billion in 2017–2018 and it is the largest supplier of generic medicines globally, contributing up to 20–22% of global export volume (IBEF, 2018). In particular, India manufactures generic antiretroviral medicines, which facilitated the rapid scale up of treatment for human immunodeficiency virus (HIV) in low-resource settings, particularly in Africa (Waning, Diedrichsen and Moon, 2010). Given their leadership around intellectual property rights and access to essential medicines, coupled with their strategic position as a BRICS (Brazil, Russia, India, China and South Africa) country, India is well placed to assume a broader leadership role for South–South health collaborations that facilitate access to medicines and medical products.

A number of foundations and global health initiatives, such as the Bill and Melinda Gates Foundation and the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund), have also played important roles in financing health programmes and, in some instances, health cooperation in the region. For example, for the period 2017–2020, the Global Fund allocated over US\$ 2 billion to countries in Asia, in partnership with the ADB, to support the financing, design and implementation of HIV, malaria and TB programmes, as well as health systems strengthening activities, mostly through intercountry cross-border programmes and collaboration (The Global Fund, 2017a). In addition, Bloomberg Philanthropies has been active in the area of tobacco control in Asian low- and middle-income countries (LMICs) (Mackay, Ritthiphakdee and Reddy, 2013), particularly through the Bloomberg Initiative to Reduce Tobacco Use Grants Program (Tobacco Control Grants, n.d.). However, while international funding for health and social development has been important in Asia, within ASEAN, most member states currently rely on domestic funding to support such programmes, with few exceptions, including Cambodia and Lao People's Democratic Republic. Furthermore, all middle-income countries within ASEAN have transitioned or are in the transitioning process from funding support of the Global Fund and Gavi, the Vaccine Alliance.

Key challenges have also emerged in the context of international partners' support for health and development programmes. Ensuring accountability and effective coordination of donors and donor-sponsored programmes has been a long-standing issue in Asia, as well as in other LMIC settings, at times leading to inefficient duplication of health programmes and gaps in the delivery of essential services. In Cambodia, for instance, fragmentation of donor-sponsored health programmes has been a challenge for many years, although new mechanisms have been developed recently to promote local ownership and to improve coordination between the government and international development partners (Box 1.1). The Philippines has faced similar challenges in coordinating various actors and programmes, and also offers important lessons in terms of establishing institutional arrangements, such as the Sector Development Approach for Health (SDAH) (World Bank, 2011), to ensure alignment of priorities and to harmonize activities to enhance donor and lender accountability (Box 1.2).

Box 1.1 International organizations and health sector governance in Cambodia

Following decades of turmoil and conflicts, from the early 1990s, Cambodia has engaged in a process of democratic transition and institutional reforms, which opened the country to the involvement of the full spectrum of international development actors, including regional donors such as the Japan International Cooperation Agency (JICA) and the Korea International Cooperation Agency (KOICA) and non-regional donors such as the United States Agency for International Development (USAID), Department of Foreign Affairs and Trade (DFAT) Australia, Department for International Development (DfID) in the United Kingdom (UK), and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). In the health sector, sustained efforts have been made to improve service delivery and address health challenges and inequities, with substantive financial and technical support from international partners; it was estimated that the official development assistance (ODA) for health to Cambodia increased by 628% in the period 2000–2010 (WHO, 2010). These efforts, combined with domestic economic growth, have contributed to a general improvement in population health, especially in the areas of infectious diseases, child and maternal health. However, coordination of international donors, and between different donor-sponsored initiatives, has been a major challenge in Cambodia, at times resulting in the duplication of programmes and a lack of synergies. In addition, international organizations have tended to focus on vertical programmes in keeping with the global health agenda, but other important public health priorities in the country (such as the increasing burden from NCDs) have been neglected (Liverani, Chheng and Parkhurst, 2018).

In the past decade, however, new policy mechanisms have been developed to support more efficient policy dialogue and coordination between domestic and international stakeholders. In particular, established in 2004, the Technical Working Group for Health (TWG-H) is a participatory forum for health policy-making to improve aid effectiveness, harmonization and alignment with development partners (Liverani, Chheng and Parkhurst, 2018). Second, the strengthening of institutional structures in the Ministry of Health (MoH) and economic growth have increased local capacities for decision-making and programme implementation. In 2007, for example, the Cambodian government introduced a Midwifery Incentive Scheme, which aimed to reduce maternal mortality rates by paying midwives US\$ 15 or US\$ 10 per live birth

at public health centres and government hospitals, respectively. This scheme, which is entirely implemented and financed by the national government, illustrates a shift to local leadership in policy formulation and management. The Cambodian government has also taken greater financial responsibility for health policies that were originally introduced and supported only by international actors – such as the “health equity funds”, a financing mechanism to improve access to health services for the poor – another indicator of change, which may improve sustainability of interventions and local ownership (Khan et al., 2018).

Box 1.2 Health cooperation in the Philippines

Over the past two decades, Development Assistance for Health (DAH) in the Philippines has played a supportive role during the implementation period of the Millennium Development Goals (MDGs) and the revitalization of universal health coverage (UHC) under the Aquino administration. As an LMIC in South-East Asia, Philippines has been a recipient of external funding that supported ongoing domestic health reforms and investments. Major bilateral partners include the USA, Japan and Spain, with whom the Philippines has deep historical ties; newer partners include Germany and Republic of Korea. Multilateral donors and lenders include the ADB (with its headquarters in Manila), the EU, the Global Fund, the World Bank, WHO and other UN agencies.

The Philippine National Health Accounts reveal that while health spending from external sources increased from Philippine pesos (PhP) 7.681 billion (US\$ 144 million) in 2009 to PhP 13.976 billion (US\$ 261 million) in 2016, their share of the total budget remained at slightly more than 2% over the ten-year period (National Statistical Coordinating Board, 2013; PSA, n.d.). The Department of Health (DoH) also estimated that DAH for the period 2014–2019 amounts to PhP 22.8 billion (US\$ 426 million), the majority of which is in the form of grants. DAH-supported projects and programmes include technical assistance to improve the delivery of health services in maternal and child health, malaria, tuberculosis (TB) and HIV (DoH, 2014).

In accordance with the 2005 Paris Declaration on Aid Effectiveness, the DoH adopted the SDAH in 2007 (World Bank, 2011) – a variation of the sector-wide

approach (SWAp) implemented in several countries to ensure alignment of priorities, harmonize activities and processes, and enhance donor and lender accountability. SDAH ensures that development assistance is aligned with the national health strategy, effectively coordinated to reduce duplication and fragmentation, and projects are sustained and institutionalized in appropriate agencies. Through its Bureau of International Health Cooperation, the DoH coordinates with bilateral and multilateral partners, oversees the implementation of DAH-supported projects, and convenes coordination mechanisms with partner agencies such as the annual Joint Appraisal and Planning Initiative (JAPI) meetings where government and development partners jointly review and report on progress towards the implementation of UHC.

Apart from the health-related MDGs and implementation of UHC, another area of international health cooperation and development assistance unique to the Philippines is emergency preparedness and humanitarian response. Due to the Philippines' high vulnerability to natural disasters such as typhoons, storm surges, earthquakes and volcanic eruptions, external partners have supported the efforts of the DoH in building capacity for disaster preparedness and providing essential health services in the immediate recovery and long-term rehabilitation phase. During times of calamity, the cluster approach adopted widely in the humanitarian response community is activated across all sectors. With support from the WHO country office, the DoH activates the health cluster, which convenes organizations involved in the systemwide response, including bilateral and multilateral agencies, and nongovernmental organizations (NGOs). For example, when the Philippines was hit in 2013 by Typhoon Haiyan, the strongest typhoon to ever hit land in history, the country received substantial humanitarian aid to fund immediate recovery and long-term rehabilitation. The Financial Tracking Service of the UN Office for the Coordination of Humanitarian Affairs (UN OCHA) recorded that in 2014, US\$ 54.1 million went to health, US\$ 14.5 million to nutrition, and US\$ 61.5 million to water, sanitation and hygiene (WASH), covering 68.1%, 96.4% and 76.0% of the projected need for each sector, respectively (UN OCHA, n.d.).

The Philippines has also been leading internationally in trade in health services. In response to a rising demand from high-income countries (HICs), health workers, particularly nurses, have become one of the Philippines' most valuable exports. The emigration of health professionals has been facilitated by a regulated system supported by a substantial number of nursing and caregiver schools, recruitment agencies linked to overseas employers, and the use of bilateral labour agreements with destination countries that ensure the

protection of migrant workers (Institute of Health Policy and Development Studies, 2005). Meanwhile, the Philippines has also become a world leader in business process outsourcing, providing cheap labour for clients in HICs to deliver a wide range of remote services, including medical transcription services. In 2005, the size of the Philippine medical transcription business was estimated at US\$ 150 million, although it only accounted for 1.7% of the industry globally (Ramo, 2005). Finally, in recent years, the Philippines has also pursued initiatives to promote its growing medical tourism industry. However, as the country continues to grapple with health care problems domestically, it is struggling to compete with neighbouring countries with more mature medical tourism industries, such as Malaysia, Singapore, and Thailand (Pocock and Phua, 2011).

Currently, the Philippines is also engaging in bilateral and multilateral partnerships to strengthen its national health system. For instance, the country has been an active participant of the Joint Learning Network on Universal Health Coverage (JLN), which seeks to co-develop “global knowledge products” that help implement complex health systems reforms to progress towards UHC (JLN, n.d.). Furthermore, the DoH is closely working with the Ministry of Public Health of Thailand on building capacity for health policy and systems research. Thai experts have trained Filipino practitioners on topics such as health technology assessment, while Philippine DoH staff have been seconded to Thailand’s International Health Policy Program (IHPP) and Health Intervention and Technology Assessment Program (HITAP) to gain experience in health policy research.

Finally, in addition to being a recipient of DAH, humanitarian aid and technical expertise, Philippines has become an emerging partner, leader and contributor in regional health cooperation within ASEAN. Over the past two decades, Philippines has collaborated with fellow ASEAN countries on joint initiatives to tackle diverse regional health issues such as pandemic preparedness, disaster management and NCDs. The Philippines has strongly advocated for crafting mutual recognition arrangements (MRAs) to facilitate international mobility of doctors, nurses and dentists as part of ASEAN regional economic integration, which started in 2015 (Invest in ASEAN, n.d.). In 2017, the Philippines served as the chair of ASEAN and led the 50th anniversary celebrations. The Philippines spearheaded the drafting of three health-focused, high-level declarations signed by the heads of State on ending malnutrition, enhancing disaster management and addressing AMR (ASEAN, 2017).

1.3.4 Regional leadership: DAH, technical expertise and influencing global norms

In addition to traditional donors, the involvement of several countries within Asia, such as China, Japan, India and the Republic of Korea, has been an important aspect of regional cooperation for health, particularly in the context of decreasing assistance from Western donors as countries transition from low- to middle-income status (The Asia Foundation, 2014). Japan (Box 1.3) has long been a major donor in Asia, although other countries are now providing increasing support to health programmes in the region, including LMICs such as Thailand through its International Cooperation Agency (TICA). Indeed, China has transitioned from being the world's largest recipient of aid to a net provider of foreign assistance by 2011, and, while hotly contested, its "New Silk Road" or the so-called "Belt and Road Initiative" has promised to transform the landscape of DAH (Gostin, 2018). Moreover, the Government of Indonesia has recently announced that it will be establishing a single agency for its international aid programmes called Indonesian Aid with an initial budget of US\$ 74 million (Sheany, 2018). Development banks in Asia, namely the ADB and the New Development Bank (NDB), are becoming increasingly influential in the regional health architecture, particularly in funding health programming and generating coherence across health policy and other areas of public policy and their lending priorities. Much of the health programming in the region is also dependent on contributions from innovative global health initiatives, such as the Global Health Innovative Technology (GHIT) Fund and the Public Health Foundation of India (PHFI).

In addition to financial contributions, some Asian countries are also emerging as regional leaders through the provision of technical assistance, such as Thailand (Wenham, 2018), and the facilitation of regional health policy discussions, as demonstrated by the case of Philippines (Panel 2). More South-South collaboration around trade and health is important in Asia, given the context of a rising burden of NCDs that are driven in part by policy incoherence between trade policies and public health (Baker, Kay and Walls, 2015). For example, while most ASEAN member countries have embraced the WHO Framework Convention on Tobacco Control (FCTC) (except Indonesia) and have actively implemented some form of tobacco control policy, many States also invest in or promote the tobacco industry

where tobacco manufacturing is a State enterprise in some countries, often justifying such behaviour on the grounds of poverty alleviation and economic growth (Chongsuvivatwong et al., 2011).

Asian states are improving regional governance for health by both implementing and shaping regional and global health agendas and norms. For instance, many Asian states have been signatories to global health frameworks, including, for instance, the IHR (2005) and the FCTC. Implementation of tobacco control measures with the FCTC, however, has been mixed. For example, exposure to second-hand smoke is a common problem across Asia; in Pakistan, for instance, more than 80% of people are exposed to second-hand smoke in restaurants (Drope et al., 2018). Other countries such as Indonesia have yet to sign the FCTC despite 76.2% of men in the country smoking daily (The Tobacco Atlas, n.d.). By contrast, some countries are leading by example in implementing global commitments; Singapore has been one of the top performers in progressing towards the health-related SDGs, ranking in the highest quintile of countries across the globe (Lim et al., 2016).

In addition to implementing global health norms at the national level, Asian States are also increasingly shaping these norms and frameworks. During the FCTC negotiations, for example, the governments of India and Thailand strongly advocated for the participation of CSOs, which proved to be critical to the success of implementing the FCTC (Lee, Pang and Tan, 2013). ASEAN and the WHO Regional Office for South-East Asia also played important roles in the FCTC process by balancing various tobacco-related interests and generating consensus among discordant States at the regional level before engaging in global negotiations at the Conference of Parties (Lee, Pang and Tan, 2013). In terms of UHC, Japan (Box 1.3) and Thailand (Box 1.4) have been influential in advocating for national prioritization of UHC in the region and at the United Nations General Assembly (UNGA).

At the same time, however, it has been argued that Asian countries have largely been “rule takers” instead of “rule makers” in terms of global health frameworks and norms, largely due to their limited capacity to engage in global health negotiations in a proactive way and to enduring tensions between notions of sovereignty and collective action (Yeling, Lee and Pang, 2012).

Box 1.3 Japan's global health leadership

Japan has long prioritized global health in its approach to international diplomacy. For instance, action on health issues has been central to Japan's agenda in all of the Group of Seven (G-7) Summits it has hosted (Sakamoto et al., 2018). At the Okinawa Summit in 2000, Japan's leadership on infectious diseases was critical to the establishment of the Global Fund, to which the country continues to provide funding support. In 2016 alone, Japan pledged US\$ 800 million for 2017–2019 to the Global Fund's Fifth Replenishment, a 46% increase compared to its previous pledge, and the largest proportional increase among government donors (The Global Fund, 2017b).

Japan also hosted the G-8 Summit in Hokkaido in 2008 where it highlighted the importance of strong health systems. Importantly, Japan will host, for the first time, the G-20 Summit in Osaka in June 2019 where the country's health priorities and strategies will be presented. The Summit will be followed by a Health Ministers' Meeting in October 2019 in Okayama.

Japan's leadership was also critical to the inclusion of UHC in the SDGs (Abe, 2015), which Japan continued to promote throughout its G-7 presidency in 2016 (Sakamoto et al., 2018). Drawing on its great progress towards UHC since the early 1960s during a time of rapid economic development, Japan continues to provide assistance to LMICs to work towards achieving resilient and sustainable health systems and reducing inequalities (Shiozaki, 2016).

The country has also led the global community on innovation in global health through, for example, the GHIT Fund, an international public–private partnership that funds research to address the burden of priority infectious diseases and poverty in LMICs (GHIT Fund, n.d.). Japan was also the fifth-largest global health donor among members of the Organization for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) in 2016 (Donor Tracker, n.d.).

Recently, Japan has not only identified but also led and contributed to global health as a key tenant of their long-term health-care policy vision, "Japan's Vision: Health Care 2035", which will guide the country's health systems reforms over two decades (Miyata et al., 2015). Importantly, as the fastest ageing nation, addressing domestic health-care challenges associated with ageing societies will be critical for Japan and will also enable them to share lessons with other countries in the region regarding how health systems can be sustainable while ensuring equity (Shiozaki, 2016).

Box 1.4 Thailand as a role model for regional health cooperation

Thailand is another key global health leader, particularly given its domestic progress towards UHC at a relatively low cost (Reich et al., 2016). Given that the country's rapidly growing economy has attracted many migrants from neighbouring Asian countries, particularly from Cambodia and Myanmar, the country has also emerged as a leader in extending coverage to registered and non-registered migrants working in the formal sector (Suphanchaimat, Pudpong and Tangcharoensathien, 2017; Tangcharoensathien, Thwin and Patcharanarumol, 2017), although there have been challenges in extending coverage to those with a precarious immigration status (Guinto et al., 2015).

Thailand chaired the long negotiation for a WHO Global Code of Practice on the International Recruitment of Health Personnel, the second WHO voluntary Code at the 2010 World Health Assembly and has been playing an active role in health workforce policies (Taylor and Dhillon, 2011). As Chair of the Foreign Policy and Global Health Group (a group of seven countries convened through the Oslo Ministerial Declaration, comprising Brazil, Indonesia, France, Norway, Senegal, South Africa and Thailand), in 2017, Thailand had tabled two UNGA resolutions related to UHC; inter alia, one calls for a UN high-level meeting on UHC in 2019 and the other proclaims 12 December as International UHC Day (Oslo Ministerial Declaration, 2007). Thailand has also led by example when it comes to generating coherence across trade and health policies (Thaiprayoon and Smith, 2015), sharing its experiences of health systems development, and providing humanitarian and technical assistance to neighbouring countries in Asia, as well as outside of the region in Africa and the Pacific Islands (Ministry of Public Health, 2017).

As noted above, Thailand has played important roles in negotiating global frameworks such as the FCTC, as well as in challenging global intellectual property regulations to improve access to medicines (Moon and Szlezák, 2013). Global health cooperation will remain a top priority on the national agenda, as evidenced by the adoption of the Global Health Strategic Framework 2016–2020, which seeks to strengthen Thailand's leadership and role in agenda-setting at the regional and global levels (Ministry of Public Health, 2017).

1.3.5 The contested space for civil society engagement

CSOs – referring to those organizations that operate outside of the State and the market (Lee, 2010) – play an important role in regional governance

for health. This group of actors is highly diverse (Youde, 2012). For example, in Bangladesh, CSOs range from large-scale organizations with multimillion-dollar budgets that employ thousands of people to local-level grass-roots organizations (Clayton, Oakley and Taylor, 2000). Despite this diversity, some common roles for this group include advocacy, policy-making, strengthening accountability, service provision, and bridging the gap between regional governance and local implementation (Nodzinski et al., 2016). The world's largest NGO in this area, BRAC based in Bangladesh, has contributed substantially to health improvement in rural communities throughout Bangladesh and has become a critical component of the country's health-care delivery system (Chowdhury et al., 2013). Other examples at the national level include networks and organizations of people living with HIV in Cambodia and Thailand, which have had a prominent role in response efforts and in ensuring that the rights of those affected by HIV/AIDS are promoted and protected (Wells-Dang and Wells-Dang, 2011); indeed, civil society's contribution was key to scaling up access to antiretroviral therapy to meet universal coverage in Thailand (Tantivess and Walt, 2008). At the regional level, Solidarity for Asian People's Advocacy (SAPA) aims to enhance communication, cooperation and coordination among NGOs working in Asia, engaging key regional actors such as ASEAN (Nodzinski et al., 2016). At the local level, CSOs in Asia have been particularly effective in service delivery for vertical programmes, but have delivered fewer results in more horizontal programming, largely due to their reliance on external donors that favour disease-specific approaches (Wells-Dang and Wells-Dang, 2011). CSOs have also been particularly important health-care providers in Asia, sometimes working in partnership with governments (Zaidi et al., 2017). An example of this type of collaboration that has made a considerable impact is the Heartfile Lodhran cardiovascular disease (CVD) prevention project in Pakistan, which is jointly delivered by Heartfile – an NGO aimed at improving health systems to progress towards UHC in Pakistan and in other LMICs (Heartfile, n.d.) – and the National Rural Support Program in Lodhran district, which implemented a community-based CVD primary prevention project to train “lady health workers” as a means to reach populations that would otherwise be excluded (Nishtar et al., 2007).

Despite some collaboration between governments and civil society in Asia, it has been argued that the influence of CSOs in governance in the region has been relatively limited, and that cooperation between national and regional bodies and civil society has not been institutionalized (Lamy and Phua, 2012a; Nodzenski, 2012; Nodzenski et al., 2016). By contrast, Asian governments could draw on the unique position of civil society to gain legitimacy and political support to influence both regional and global governance for health (Gostin, 2013).

1.3.6 The expansion of the private for-profit sector

Alongside CSOs, a wide range of privately owned for-profit institutions and individuals are playing an increasing role in the health architecture in Asia. Health services have become an important industry with a mix of formal and informal, private and public providers, together with a growth in medical tourism and international trade in health services (Chongsuvivatwong et al., 2011). The private for-profit sector has traditionally played multiple roles, which vary across countries and include service delivery in both the formal and informal sector, technical expertise and capacity-building, research and development activity, manufacturing and distribution of pharmaceutical products, developing new medical technologies, and financing global and regional activities. The private sector's role in health-care delivery is heterogeneous in the region. In India, for example, the private sector dominates service provision, with a high private share of health expenditure and a low ratio of public spending to gross domestic product (GDP); whereas in Thailand, public sector spending supports a universalist public sector that is complemented by private sector investment and activities (Mackintosh et al., 2016). As these examples show, the private sector has engaged in service provision alongside the public sector in many countries, expanding health-care coverage; however, concerns have been raised that private for-profit providers divert doctors and nurses from the public health sector, exacerbating shortages in human resources. In addition, the for-profit private sector is often weakly regulated across Asia (Florini, 2014); regulation of the private sector should seek to ensure that service provision is fair and equitable, and aligned to national and regional strategies (Morgan, Ensor and Waters, 2016). Medical tourism is another area that the private sector has promoted in countries such as

Singapore and Thailand, capitalizing on their comparative advantage to sell health services and other recreational packages to “wealthy foreigners” (Chongsuvivatwong et al., 2011). Finally, the region is home to some of the most innovative forms of public–private mix in health services (Chongsuvivatwong et al., 2011) and there is growing recognition of the importance of public–private collaboration to achieve regional health goals, although there is a need for new mechanisms to harness the positive developments and to address the remaining challenges.

1.4 The complexity of the regional health architecture

As discussed in the preceding sections, the regional health architecture in Asia is characterized by its complexity. Citing Simon (1962, p. 468), Koenig-Archibugi (2013) highlights that complex systems can generally be defined as those “made of a large number of parts that interact in a non-simple way”. As with global governance for health more broadly, complexity in the regional health architecture is related to the unstructured nature of health cooperation and the plurality of actors operating in this space (Koenig-Archibugi, 2013). In Asia in particular, the diversity of political, cultural, religious, linguistic and economic arrangements across countries poses a significant barrier to generating collective action (Lamy and Phua, 2012; Lee, Pang and Tan, 2013). So too does the primacy of the non-interference principle in the region and the associated lack of willingness in some contexts to contribute to regional health collaboration, which in turn relies on the challenge of sustaining donor funding. Health services are uniquely complex in Asia as they have become a lucrative industry in the region with, for example, a growing market for medical technologies, medical tourism and trade in health services, alongside a mix of public and for-profit providers that are often weakly regulated (Chongsuvivatwong et al., 2011). This lack of regulation and unique landscape of health-care markets makes governing health in the region particularly complex. The regional architecture is therefore characterized by a low level of communication, data-sharing and best practices management between the various actors, and cooperation appears ad hoc rather than strategic (Nodzinski et al., 2016). To add to this complexity, health programming in the region is highly decentralized, with multiple overlapping initiatives that are often underpinned by different normative frameworks, timeframes and objectives

(Liverani, Hanvoravongchai and Coker, 2013). Similarly, the institutional landscape in the region, as with the global health landscape more broadly, lacks the necessary coherence to address cross-sectoral health issues (Lee, Pang and Tan, 2013), as shown by the example of tobacco control.

1.5 Regional cooperation and communicable disease control in Asia

The case of communicable disease control in Asia further illustrates the complex dynamics of regional health governance. As previously discussed, the prevention and control of communicable diseases has been a key area for regional health cooperation in different Asian contexts. In South-East Asia, early initiatives were developed during the 2000s, in recognition of the transnational nature of endemic and emerging diseases and the need for collective action between neighbouring countries to address common health threats. For example, the Mekong Basin Disease Surveillance (MBDS) network, established in 2000, has been a pioneering and ambitious attempt to create a regional infrastructure for infectious disease control in South-East Asia, involving Cambodia, China (Yunnan province), Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam (Phommasack et al., 2013). Based on equal participation, rotating leadership and mutual learning, the MBDS network adopted a distinctive governance model in which each member country is responsible for the management and coordination of one specific programme component: cross-border cooperation (Lao People's Democratic Republic), human-animal sector interface and community-based surveillance (Viet Nam), human resources development (Thailand), ICT capacities (Cambodia), risk communication (Myanmar) and laboratory capacities (China). Further, MBDS has developed an extensive regional network for the cross-border sharing of expertise, epidemiological data and information, from the local communities to the provincial and central levels. Similarly, the Middle East Consortium on Infectious Disease Surveillance (MECIDS) was established in 2003 to facilitate public health cooperation between Israel, Jordan and Palestine – a prominent reminder that a concern with shared health issues can bridge political disputes and promote the pursuit of the common good (Leventhal et al., 2006).

Over the past two decades, other regional programmes for the prevention and control of infectious diseases have been established in Asia, either focused on specific diseases such as HIV (Sharma and Chatterjee, 2012) and avian influenza (ADB, 2014) or “horizontal” in scope such as the MBDS and MECIDS networks. In addition, specific initiatives have been developed to support malaria control at the regional or subregional level, including the Asia Pacific Leaders Malaria Alliance (APLMA), an advocacy forum for high-level engagement and regional coordination, and the Strategy for Malaria Elimination in the Greater Mekong Subregion (GMS) (2015–2030). In the GMS, the identification of artemisinin resistance at the Cambodia–Thailand border – and subsequent reports of widespread cross-border transmission (Ashley et al., 2014) – has also prompted the adoption of a regional emergency response (WHO, 2013). To deal with the resurgence of malaria in the region, especially threats posed by artemisinin-resistant strains in the Mekong Basin, the Australian DFAT and the Gates Foundation have established the APLMA with the objective of malaria elimination in the region by 2030 (APLMA Secretariat, n.d.).

Individual countries have also taken the lead in promoting regional information and data-sharing. Given the continuing problems with dengue in all countries of the region, Singapore has shown leadership in establishing the UNITEDengue initiative, which aims for timely and open sharing of epidemiological and virological surveillance data on dengue between countries in the region (UNITEDengue, n.d.).

As described earlier, organizations for political and economic cooperation have also provided institutional platforms to support regional public health programmes and strategies. To different degrees, the prevention and control of infectious diseases has been on the agenda of the ASEAN Plus Three, the ADB, SAARC and APEC, in joint action with the WHO Regional Office for South-East Asia and the WHO Regional Office for the Western Pacific. For example, as part of the ASEAN work programme in the health sector (2016–2020), the ASEAN Secretariat coordinates a wide range of activities for the prevention and control of infectious diseases, including continued support to existing disease surveillance networks, preparedness through joint simulation exercises and the establishment of regional mechanisms to supply less-resourced countries with drugs/vaccines in

the event of outbreaks, and the ASEAN Field Epidemiology Training Programme (FETP), led by Thailand (ASEAN, n.d.-b).

This diverse range of initiatives has contributed to intensification in various forms of collaboration between Asian countries, including the exchange of epidemiological data and information between regional partners for routine disease surveillance or in the event of emergencies. Additionally, the increase in regional meetings, the close collaboration through cross-border health committees and workshops has promoted the sharing of expertise, experiences and good practices among health professionals, policy-makers and other stakeholders. Gradually, these collaborations build and sustain trust among local front-line public health workers and local policy-makers, which foster close collaboration.

Despite these achievements, key challenges remain. Regional public health cooperation and information-sharing is crucial to infectious disease control, particularly in transnational disease “hotspots”, such as the GMS, where cross-border population mobility, the regional ecosystem and trade may facilitate disease emergence and transmission. However, the achievement of effective regional cooperation requires convergence and communication between different public health systems (including systems for the collection and dissemination of epidemiological data), which are variably shaped by national governance structures, capacities, rules and practices (Liverani et al., 2018).

The nature of institutional and legal arrangements in place is another important variable that may affect the practice of international cooperation. Asian countries are bound to the provisions in the IHR (2005), which require health authorities to report to WHO and Member States health threats of international concern within 24 hours of detection. However, national capacities to implement the IHR are variable and, consequently, so are their abilities to report disease outbreaks to neighbouring countries and global health organizations. In addition, virtually all regional health programmes in Asia have been established through non-binding “soft law” agreements such as memoranda of understanding; thus, they provide weak legal bases to support collective action, especially for complex interventions that require clear rules and operating procedures, such as joint outbreak

investigations. Regional organizations such as ASEAN and SAARC have the potential to support regulatory convergence, common rules and standards in collaboration with WHO, given their well-established institutional profile. However, as noted earlier, these organizations have historically been influenced by consensus in decision-making and a strong sensitivity towards national sovereignty, limiting their power to develop and enforce provisions in sensitive areas such as regional (health) security (Liverani, Hanvoravongchai and Coker, 2012; Pattanaik, 2010). Lastly, the implementation of regional programmes for infectious disease control in both South and South-East Asia has benefited from the financial assistance of donor countries, private philanthropists such as the Rockefeller Foundation, the Global Fund and development finance institutions such as the ADB (Coker et al., 2011). This large flow of donor funds has undoubtedly contributed to building an infrastructure for regional public health cooperation. Yet, funding is usually provided to support stand-alone programmes, raising concerns about the integration of these programmes in the wider national health systems and their sustainability in the long term.

1.6 Conclusions

This chapter provides an overview of the regional health architecture in Asia and its governance, with examples from different contexts. It has shown that the health architecture in Asia is characterized by its complexity. While a sense of solidarity and a shared vulnerability to health threats has encouraged collective action in the region, regional governance for health remains a complex and demanding task, requiring convergence and communication between different health systems, as well as diverse political, economic, social and cultural arrangements. The unique nature of health services, which have become a lucrative industry in the region – particularly in the context of an expanding market for medical technologies, medical tourism and trade in health services – alongside the mix of public and private providers present distinct challenges for governance (Chongsuvivatwong et al., 2011). Case studies from Cambodia and the Philippines illustrate how insufficient coordination between donors and their sponsored programmes throughout Asia has resulted in a lack of synergies across health initiatives, as well as the prioritization of vertical disease programmes that may not necessarily reflect national health needs.

However, the examples also show how Asian states are developing new mechanisms to promote coherence across programmes at the national and regional levels.

To overcome some of these barriers and improve health cooperation in Asia, regional organizations such as ASEAN and SAARC are in a good position to promote regulatory convergence, common rules and standards, given their well-established institutional profiles but not without their own challenges. Increased investment will be important to facilitate greater cooperation between states and to improve coherence across sectors.

Lastly, amid shifting political and economic influence from the West to the East, a so-called “Rising Asia” presents an important opportunity to strengthen regional cooperation and improve global health capacities to contribute more firmly as a region to global governance for health (Yeling, Lee and Pang 2012). Case studies from Thailand and Japan show that regional actors are gaining prominence in this space and are increasingly committed to taking the lead on coordination roles and on global health agenda-setting. One key area of opportunity would be for Asian actors to capitalize on growing political and economic power to lead more South–South collaborations and gradually become “rule-makers and game-setters”. Looking ahead, given the rise in relevance of global health in Asia, and the associated expansion of the regional health architecture, actors throughout the region have a critical opportunity to generate greater dialogue, synergies and commitment to regional governance for health and to lead more firmly in the global health space.

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Chapter 2. Planetary health and resilience in Asia

Selina Lo, Katrina Lyne, Emily Y Chan, Anthony Capon



2.1 Introduction

The Rockefeller–*Lancet* report: *Safeguarding human health in the Anthropocene Epoch* (Whitmee et al., 2015) defined planetary health as “the health of human civilization and state of the natural systems on which it depends”.

Planetary health is not only about the well-documented global health challenges adjoined with natural ones. It is also about reimagining and building a future that will protect and sustain all life within our fragile but diverse biosystems and biosphere as a human civilization.

Two of the world’s great civilizations began in Asia; in India over 4000 years ago in the valley of the Indus River and in northern China in 1500 BCE around the Hwang Ho River.

Asia is currently undergoing rapid transitions in several areas that impact on the physical environment and the stability of all governing systems to support the populations interacting with the natural systems.

This chapter examines the general concept and origins of planetary health, and briefly describes some of the major transitions occurring in Asia (epidemiological and demographic, ecological, economic, energy, nutritional and urbanization). We then look at the notion of resilience and health and systems, and briefly explore planetary health in relation to the SDGs UHC. Finally, this chapter ends with some examples of Asian planetary health initiatives to learn from and guide recommendations. The chapter focuses on South-East and East Asia, although generalizable reports are drawn from the Asia Pacific region. The objective of this chapter is to introduce to readers the concept of planetary health as an emerging discipline within Asian contexts to enable formulation of local solutions. It does not provide exhaustive systems or governance approaches; rather, an invitation to the interested reader to engage further.

2.1.1 Origins of planetary health

The original 2014 Planetary Health Manifesto, which predated the Rockefeller–*Lancet* report, called for a planetary health movement to address new and future challenges: “to support collective public health

action at all levels of society – personal, community, national, regional, global, and planetary....Our vision is for a planet that nourishes and sustains the diversity of life with which we coexist and on which we depend....Planetary health is an attitude towards life and a philosophy for living. It emphasises people, not diseases, and equity, not the creation of unjust societies. We seek to minimise differences in health according to wealth, education, gender, and place. We support knowledge as one source of social transformation, and the right to realise, progressively, the highest attainable levels of health and wellbeing" (Horton et al., 2014). The Manifesto argued that current patterns of overconsumption are unsustainable and will ultimately cause the collapse of our civilization. A new vision of cooperative and democratic action at all levels of society is required (Horton et al., 2014).

This chapter does not seek to redefine planetary health for Asia; rather draw out some examples of learning as well as describe the Asian situation.

2.1.2 The Rockefeller–*Lancet* Commission

At a 2013 meeting convened in the People's Republic of China by The Rockefeller Foundation to identify grand health challenges of the 21st century, The Rockefeller Foundation and *The Lancet* co-convened a Commission on Planetary Health, with sixteen members from diverse disciplinary and regional backgrounds, chaired by Professor Andy Haines. The Commission report *Safeguarding human health in the Anthropocene epoch* (Whitmee et al., 2015) concluded that we have mortgaged the health of future generations to realize economic and development gains in the present, and that the continuing degradation of natural systems threatens to reverse the health gains seen over the last century. Climate change, ocean acidification, land degradation, water scarcity, biodiversity loss and toxic pollution of air, water and ecosystems – all anthropogenic global changes – have direct and indirect health impacts with those least responsible for the changes – poor people in developing countries – left the most vulnerable to their consequences.

Future health consequences range from increasing emergence of zoonotic diseases, food insecurity and malnutrition, to conflict and displacement.

A range of policies were identified to repair what damage can be repaired, adapt to the changes that cannot be prevented, and overcome the perverse economic and political incentives and disincentives that militate against solutions that benefit both the planet and human health. Projected environmental changes can be avoided, and the connections between people and the planet mean that solutions that benefit natural systems often also benefit human health and well-being. Wise policies to manage natural systems and steward the biosphere within safe planetary limits of change can help to safeguard future human health.

The Commission identified three categories of challenges that must be addressed to maintain and enhance human health in the face of harmful environmental change. First, conceptual and empathy failures (imagination challenges), such as an overreliance on gross domestic product as a measure of human progress, the failure to account for future health and environmental harms over present-day gains, and the disproportionate effect of those harms on the poor and those in developing nations. Second, knowledge failures (research and information challenges), such as failure to address the social and environmental drivers of ill-health, and a historical scarcity of transdisciplinary research and funding, together with an unwillingness or inability to deal with uncertainty within decision-making frameworks. Third, implementation failures (governance challenges), such as how governments and institutions delay recognition and responses to threats, especially when faced with uncertainties, pooled common resources, and time lags between action and effect (Capon, 2018). Planetary health is defined from One Health and Eco Health and Global Health by its specific focus on the health of human civilization and natural systems, and its call to action themes of intergenerational equity and transdisciplinary research and action.

Complexity is a given. All human understanding of culture and science, including that of planetary health, sits in historical and social contexts. We are living in a moment of unprecedented complexity, when things are changing faster than our ability to comprehend them (Taylor, 2001). Darwin and Wallace have described complexity in biology through the identification of natural selection and, in fact, complexity in the biological sense is what evolution is all about. Another property of complexity is

non-linearity demonstrated through causality, e.g. of chronic diseases within a “web of causality” and multifactorial reasons for the development of disease.

Geoff Rayner and Tim Lang in their book *Ecological determinants of health: reshaping the conditions for good health* (Rayner and Lang, 2012a) describe the need for new ambition in facing 21st century challenges and the various “transitions” that societies are undergoing. These included the need to recognize complexity, to create narratives that work to engage and nurture political leadership to recognize complexity and address it from global to local levels, and to promote transdisciplinary collaboration and training. However, there is still almost no incentive or pressure for this to happen, as money tends to flow through and to disciplines in their “silos”. To tackle public health in an increasingly complex world requires acknowledgement of complexity as a key characteristic of the intellectual framework. Planetary health as a field and practice provides a working framework for addressing the knowledge, governance and imagination (conceptual challenges) of Asian transitions.

2.2 Asia in transition

South-East and East Asia are regions of enormous diversity – political, social and economic – both within and between countries. In 2016, the Asia Pacific region had 60% of the world’s population – 4.4 billion people (UNESCAP, 2016a). In South-East Asia, socioeconomic development has been rapid but unequal, accentuating health disparities (Chongsuvivatwong et al., 2011). East Asia by contrast includes China, which is an economic powerhouse. Environmental concerns in the Asia Pacific region are dominated by vulnerability to disaster/extreme weather events, with risks expected to increase further due to climate change or inadequately planned socioeconomic and industrial development in vulnerable locations, exposing fragile ecosystems to a range of hazards, e.g. coastal urban zones.

Specific environmental concerns in the Asia Pacific region with threats to human health include the contamination of soil and water sources from human and industrial wastes, groundwater contamination by sea-level rises as well as arsenic in Bangladesh, China, India and Myanmar. Other issues are the widespread use of pesticides and toxic chemicals, water insecurity,

food safety/security concerns, agricultural intensification, climate change and poor animal husbandry leading to outbreaks of zoonoses, e.g. SARS, avian influenza, air pollution and biodiversity loss.

2.2.1 Demographic transition

Overall, population growth in the region is slowing down. Forty-two per cent of the region's population was living in East and North-East Asia in 1980 but by 2050 will drop to only 31% (UNESCAP, 2013). The Asia Pacific region has undergone demographic transition from high to low fertility and mortality. In 2016, fertility in the region was at 2.1 births (UNESCAP, 2016a). Demographic transition has meant that the proportion of the working population of the whole region was estimated to be at its peak in 2016 and is expected to decline, while the proportion of older persons is increasing (UNESCAP, 2016a).

Different countries in the region are in different stages. Some moved to aged societies two decades ago. The Republic of Korea, Singapore and Thailand, although able to have a large working-age population, are currently heading towards aged societies with a decreasing working-age population. China and Viet Nam have large working-age populations, changing however, as fertility declines rapidly (UNESCAP, 2013). Across the region, in 2016, 12.4% of the population is 60+ years old, and projected to reach 25.1% by 2050.

In some countries, mostly those in East and North-East Asia, the tipping point of the working-age population (year when the working-age population as a percentage of the total population starts to decline) was many years ago –1993 in Japan and Hong Kong (Special Administrative Region of China), 2012 in Mongolia. The tipping point is not projected to arrive until 2023 in South-East Asia, and 2042 in South and South-West Asia (UNESCAP, 2016a).

2.2.2 Epidemiological transition

Epidemiological or health transition implies changes in the distribution and determinants of mortality and disease, which will be covered in detail in other chapters of this edition. The 2016 Global Burden of Disease

study showed that, globally, among the risks that are the leading causes of burden of disease, household air pollution showed a significant decline from 1990 to 2016 (Gakidou et al., 2017). In East Asia, loss of healthy life (disability-adjusted life years [DALYs]) from NCDs is rising, with communicable diseases, newborn, nutritional and maternal causes on the decline (Institute for Health Metrics and Evaluation, Human Development Network and The World Bank, 2013). China is transitioning most spectacularly with reductions in maternal mortality, improvements in child survival but a burden dominated by NCDs and injuries (Institute for Health Metrics and Evaluation, n.d.). Epidemiological transition is inextricably linked to the underlying determinants of health – which include poverty, the environment and nutrition.

2.2.3 Economic transition

Since the early 1990s, the Asia Pacific region has not only seen increased economic growth but also widening of inequalities within and between countries. Eighty-two per cent of developing countries in Asia experienced rising inequality from 2000 to 2010 measured by Gini coefficients (Kanbur, Rhee and Zhuang, 2014). Development and rapid expansion have led to massive environmental degradation. Key challenges are to ensure sustained economic performance with reduction of inequity and minimization of adverse environmental consequences (UNESCAP, 2018a). The middle-income population within the Asia Pacific region rose to 51% from 2001 to 2011 of the global middle-income population (Pew Research Center, n.d.). Several countries in the region such as China transitioned from lower to lower-middle to middle-income countries in the past three decades.

East Asia and the Pacific accounted for more than a third of global growth in 2017 – mostly due to China, which is expected to continue to be a major driver of global growth (World Bank Group, 2018). Regional growth is supported by the rapidly growing working-age population, which brings economic benefits, e.g. in Cambodia, Indonesia, Lao People's Democratic Republic (PDR), Myanmar, Malaysia, Papua New Guinea, and Philippines, but poses other challenges such as provision of adequate public services. The informal workforce makes up 68% of the total regional workforce, with little or no social protection (International Labour Organization, 2018).

Overall in the Asia Pacific region, there has been a relatively high economic growth rate of 5.8% in 2018 (up from 5.4% in 2016). Developing economies are expected to grow by 5.5% in 2018 and 2019, with domestic private consumption likely to be the main source/driver of growth. However, in the medium term, potential economic growth is on a downward trend due to an ageing population, slower capital accumulation and modest productivity growth (UNESCAP, 2018a). By 2050, one in four people will be 60 years or older in the region (UNESCAP, 2016b), with a relatively high poverty incidence, and rising inequalities, particularly in the least developed countries.

Since 1990, average Chinese incomes have risen 9-fold, lifting 800 million people out of poverty. Unfortunately, the consequence has been rising inequality, and strain on the natural environment, especially increasing CO₂ emissions and increasing energy consumption. The Chinese Government has put in place an alternative sustainable scenario, which is gaining traction in China and will have important ramifications for the Asia Pacific region (UNESCAP, 2016b) (*see* Box 2.4).

According to the World Economic Forum's *Global risks report 2018*, extreme weather events, natural disasters, biodiversity loss, air and soil pollution, failure of climate change mitigation and adaptation, and water crisis are perceived as the biggest threats in the next 10 years globally (World Economic Forum, 2018). The following question is relevant in Asia. Does prosperity equate with material prosperity and does material prosperity indeed equate with good health? (Rayner and Lang, 2012b) Can social progress measured by GDP growth or growth-based economics and good health co-exist?

2.2.4 Ecological transition

For the purposes of this chapter, ecological transition (Bennett, 1976), first introduced by John Bennet (1916–2005), suggests that this transition has both a social and a technological dimension. The first is humans' growing separateness from nature as a species; the second is a tendency by humans to use increased energy to seek human comfort and wealth. From an anthropological perspective, the ecological transition is "the progressive

incorporation of nature into human frames of purpose and action” (Bennett, 1976).

This is a complex transition – involving transitions in population, mobility, natural resources, social structures, humans and other species, the Earth/ physical environments and human settlements. In Asia, there are five main direct pressures (ADB and WWF, 2012) that result in damage to natural environments, biodiversity loss, depletion of ecosystem services and loss of natural capital. These pressures include habitat loss (alteration and fragmentation), overexploitation of populations of wild species, pollution, climate change and invasive species – most of these stem from human demand for food, water, energy and land. The Asia Pacific region accounts for more than 50% of the world’s water use (UNEP, 2016). Water efficiency has improved by 90% in developing countries in the region; but overall water efficiency (water use per US\$ of GDP) was still double the world average in 2015 (UNEP, 2016). High-intensity agriculture and contamination of water sources are a major concern (UNEP, 2016).

Ecological Footprint is an accounting framework developed by the Global Footprint Network (Global Footprint Network, n.d.), which is used to measure the amount of biologically productive land and sea area that humanity needs to produce the resources it consumes, provide for its infrastructure and absorb waste. For example, the national ecological footprints of China, India, Indonesia and Japan together contribute more than three quarters of the total ecological footprint of the Asia and Pacific region. Across the Asia Pacific region, the biocapacity of countries (or the amount and productivity of natural capital such as cropland, grazing land, fishing grounds and forests that are available within a country, region, planet) is not sufficient to provide for needs. The ecological footprint exceeds the biocapacity and either countries will continue depleting the natural environment to meet needs or import (ADB and WWF, 2012).

Rapid population growth is a key driver of environmental degradation. The poor and vulnerable will be the most affected by climate change and environmental risks (Watts et al., 2018). Women and children are 14 times more vulnerable than men in climate-related natural disasters such as floods and droughts (Anderson, n.d.). Human migration driven by conflict,

displacement, population growth, economic development, inequality and climate change/extreme events has environmental consequences such as changing patterns of consumption/energy use, pressures on ecosystem services and agricultural expansion (UNEP, 2016).

Other drivers are unsustainable consumption patterns and waste production. In urban areas, the need for transport and therefore air pollution related to fossil fuel consumption, growing middle class, falling fertility and mortality rates, and ageing populations also drive environmental degradation (UNEP, 2016).

Biodiversity

The term biological diversity, contracted to “biodiversity”, refers to the variability among living organisms (both within and between species) and the ecological systems they comprise (*see* Fig. 2.1) (UNEP, n.d.).

Asia and the Pacific have many biodiversity “hotspots” (UNEP, 2016) with South-East Asia hosting some of the most biodiverse regions on the planet (Hughes, 2017). Unfortunately, the region’s biodiversity is plagued by a complex array of challenges, with implications for planetary health.

Biodiversity is linked both directly and indirectly to human health, with interactions occurring at individual, community, landscape and global scales. As a central determinant of ecosystem integrity, biodiversity is important for a range of ecosystem services, including provision of food and water, clean air, disease and pest control, and both traditional and modern medicines (WHO and Secretariat of the Convention on Biological Diversity, 2015). Human health is dependent on these services, which include determinants of social and cultural well-being.

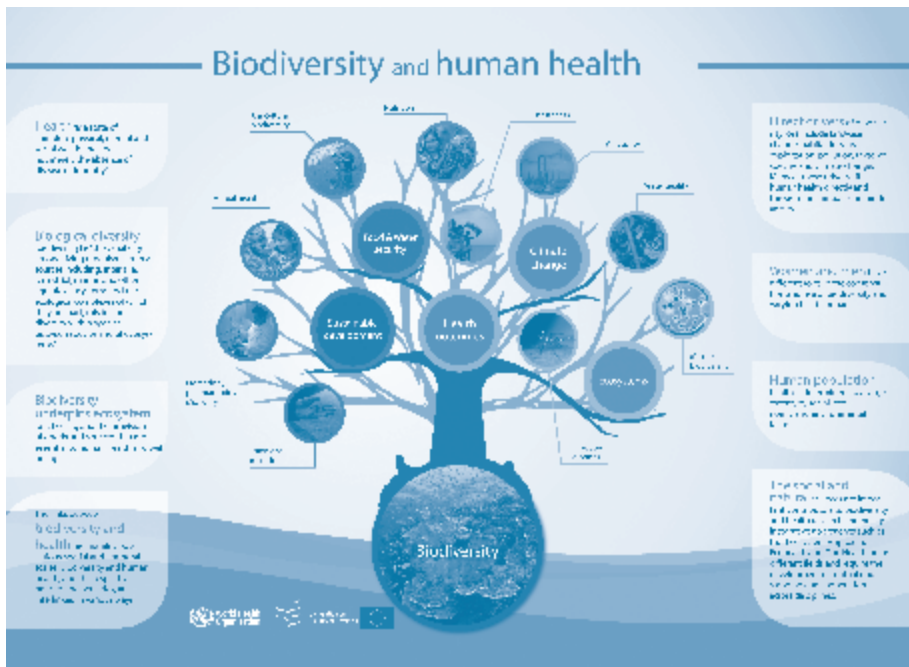
Human activities have resulted in significant biodiversity losses across Asia. A key driver is habitat destruction and land clearing driven by rapid population growth, urbanization and industrialization, and associated demands for, and overexploitation of, natural resources (WHO and Secretariat of the Convention on Biological Diversity, 2015). In South-East Asia, land clearing is driven particularly by high demands for palm oil, rubber and wood pulp; charcoal production is another contributor

(WHO and Secretariat of the Convention on Biological Diversity, 2015), highlighting the urgent need for equitable access to clean fuel technologies.

Other drivers of biodiversity loss include water management strategies (e.g. construction of dams, reservoirs and hydropower facilities), pollution, illegal trade of plants and wildlife, invasive species, unsustainable fishing practices, mining and other resource extraction processes, fires and climate change (WHO and Secretariat of the Convention on Biological Diversity, 2015). These issues are compounded by inadequate regulations, and by ineffective monitoring and enforcement of protective mechanisms.

Given the integral role of biodiversity to ecosystem function, biodiversity loss is regarded as a potential “tipping point” or fundamental threat to Earth’s life support systems, though thresholds for such losses have not yet been defined (WHO and Secretariat of the Convention on Biological Diversity, 2015).

Fig. 2.1 Biodiversity and human health



Source: UNEP, n.d.

2.2.5 Energy transition

Moving away from reliance on human and animal energy towards fossil fuel energy has shaped a new form of society in the 20th century – one based on an expected standard of living that has become almost universally a norm, particularly in countries with a growing middle class. The energy transition is described as a series of steps from the use of traditional energy (usually biomass such as wood, crop waste, animal dung) towards fossil fuels such as coal, gas and oil to nuclear and various renewable energy sources. Reliance on traditional use of biomass, rapid urbanization and industrialization, and increasing energy demands cause substantial air quality issues. Most of the particulate matter (PM) emissions from households are from the use of fuelwood and charcoal for cooking and heating, with 40% of the South-East Asian population reliant on solid biomass for cooking (International Energy Agency, 2017a).

While the benefits to society have been in improved transport, communications and public health, the current widespread reliance on fossil fuels brings direct risks to human health from toxic pollution (i.e. cardiac, respiratory and neurological effects) and is a major driver of climate change, with further direct and indirect health effects.

Demand for electricity, gas and transport fuel in Asia Pacific increased fourfold between 1970 and 2015 (UNEP, 2016) but the renewable energy supply has not kept up. Energy distribution is unequal across the region – many countries face shortfalls in meeting energy demands (UNESCAP, 2017a).

There will be large expansions in the region's power system (coal and renewables accounting for almost 70% of new capacity) with ongoing reliance on coal-fired plants – still at 40% of the mix by 2040 (UNESCAP, 2017a). Despite the grim outlook, the declining cost of renewables means more access to energy in remote areas. Energy transition offers an opportunity for new, affordable policy and technology options – energy security, environmental benefits; but requires substantial investment. China is the lead player in transition to renewable energy and will play a large role in shaping global energy use/production trends (International Energy Agency, 2017b).

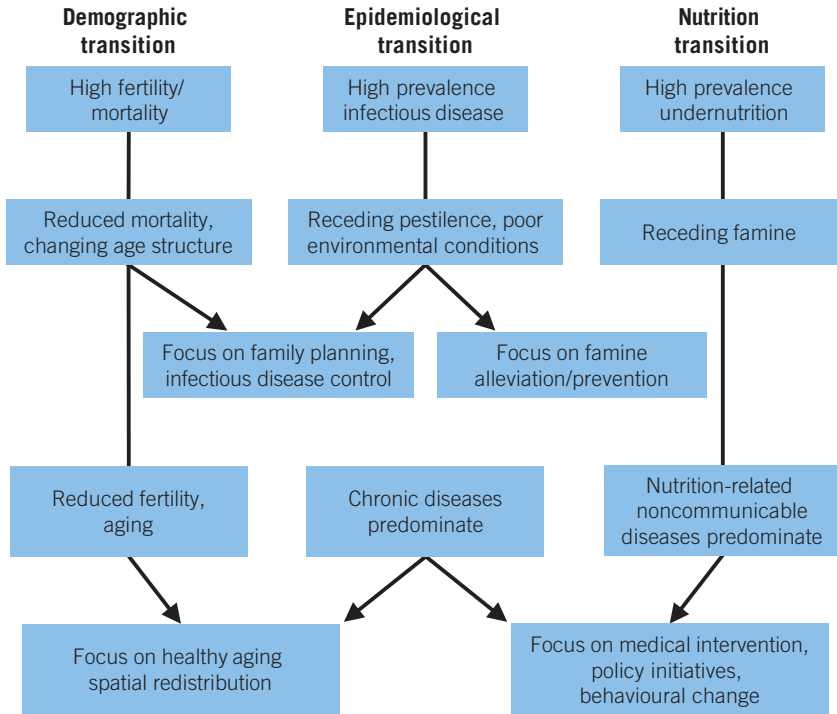
2.2.6 Nutrition transition

The American epidemiologist and economist Barry Popkin defined the concept of a “nutrition transition” to be the “historical pattern of a change in diet and physical activity witnessed in the twentieth century around the world as people became richer”. Modern societies converge towards a “western” diet high in saturated fats, sugar, salt and refined foods (Popkin, 2002). Such a diet can give rise to a higher risk of NCDs.

Other shifts that occur either along with or preceding the nutrition transition are demographic and epidemiological transitions (*see* Fig. 2.2) (Popkin, 2002). Asia is particularly vulnerable to the negative effects of these transitions. Although there is great variation within and between countries, there are several key themes in the Asian nutritional transition. People are eating more oils and fats, replacing complex carbohydrates as the energy source; more refined sugar and packaged processed fast foods and an increasingly western diet with more temperate zone fruits, legumes, dairy and meat. Pork consumption doubled in China from 1990 to 2014 (Kelly, 2016).

Drivers of the Asian nutrition transition (Kelly, 2016) are economic growth, urbanization and globalization of food systems (effects on supply chains and food production). Rising incomes and food availability resulted in positive improvements to malnutrition rates but brought the burdens of obesity and associated NCDs. In the region, prevalence of overweight increased by 2.1% per annum and obesity increased by 4.3% per annum (from 1990 to 2008). The prevalence of child overweight is increasing in every subregion except East Asia (FAO, 2017). Many countries have a “triple burden” of malnutrition (wasting, stunting and overweight) (FAO, 2016). The prevalence of global stunting in 2016 was 22.9%. The prevalence of stunting in Asia in children <5 years declined by 37% between 2000 and 2016 but remains high in many subregions. For example, in South-East Asia, 25.8% (around 15.1 million) of children are stunted (UNICEF, WHO and World Bank, 2017). Addressing the multiple layers of the nutritional transition will require a holistic approach to food systems, and the choices families and individuals make.

Fig. 2.2 Stages of health, nutritional and demographic change



Source: Popkin, 2002

2.2.7 Urban transition

Of the ten cities projected to become megacities between 2016 and 2030, six are from Asia (defined as South, South-East and East Asia) (United Nations, 2016). The accepted notion of growing (Rayner and Lang, 2012c) “urban ill-health” has been well described. Population growth in urban areas is largely due to rural–urban migration (about 20%–30% of urban population growth in the Asia Pacific region), natural growth in urban areas (births>deaths, which accounts for about 60% of urban growth worldwide) and reclassification of areas from rural to urban (“in-situ urbanization”) (UN-Habitat and UNESCAP, 2015). In the Asia Pacific region, 2.38 billion were living in urban areas in 2015 (60.1% of the urban population worldwide). Between 2000 and 2025, an estimated 1.1 billion people will be

added to urban areas in the region (UN-Habitat and UNESCAP, 2015). By 2040, the Asia Pacific region's urban areas will be home to approximately 3 billion people, and by 2050, 3.2 billion (UN-Habitat and UNESCAP, 2015).

Environmental challenges are all heightened in a city. Air pollution, poor waste management, water safety and sanitation, and access to safe drinking water, infectious diseases such as diarrhoea and emerging diseases challenge many Asian cities. Use of plastics from three Asian countries (China, Indonesia and Philippines) are responsible for much of the plastic pollution in oceans (Jambeck et al., 2015). Many cities in Asia are not ready to deal with major natural disasters (UNESCAP, 2018b). A high degree of urbanization and urban poverty results in increasing vulnerability to disaster events in developing countries. Numerous cities throughout Asia are in low-lying areas, e.g. Bangkok, Dhaka, Ho Chi Minh City, Jakarta, Kolkata.

Growing inequity and middle classes and their consumption patterns challenge the urban transition in Asia. Housing and transport prices and demands are competitive, as well as the desire to identify with "success" and "prosperity". There is increasing expectations for good governance, access to health care and long-term care institutions. In China, the expected number of private vehicles is set to increase from 58 million in 2010 to 450 million in 2030 (UNESCAP, 2018b), with implications for greenhouse gas emissions and air quality. China is moving to support the development of healthy cities (Yang et al., 2018). Mass transit systems will continue to be an opportunity to build more sustainable cities while urban poverty and slums remain a major and growing challenge. Ageing populations in many areas, changing gender roles due to improved education and employment of women, and falling fertility rates will pose special challenges for future Asian cities. Air pollution has specific health, environmental/climate and economic consequences as people move away to less polluted areas (Landrigan et al., 2017). Pollution of air, water and soil caused by industrial emissions and motor vehicles is on the rise. In the absence of aggressive intervention, ambient air pollution is projected to increase by 50% by 2050 with middle- and low-income countries being the most affected (Landrigan and Fuller, 2017). The 2017 Lancet Commission on Pollution and Health (Landrigan et al., 2017) identified recommendations that included robust

monitoring systems, integrating pollution mitigation into national planning for NCDs, and a multisectoral approach to research and policy.

Despite the challenges of urban transition, cities indeed are places of community, culture and opportunity to live sustainably. Urban opportunities abound, such as greening urban spaces, using public transit, and energy-efficient lighting and heating in residential and public buildings.

2.3 Resilience of communities and health systems to cope with the transitions

Moving through economic, ecological, epidemiological, nutritional, energy and urban transitions are all challenged by the impacts a changing climate has on health and the ability of communities and systems to adapt. Can health systems in Asia sustain its people? This section will first explore the contexts of climate change on health, then the impact of natural disasters and migration, followed by adaptation planning, and finally opportunities both in terms of co-benefits of acting on climate change and also global commitments such as the SDGs and UHC, which are assisting in building resilience across wide sectors of the community to cope with the challenges ahead.

Although a detailed look at Asian civil society and democratic changes and planetary health are outside the scope of this chapter, Asia overall is a region where all examples of governance and civil society action coexist. Modern Asian history has witnessed atrocities such as the recent plight of over 650 000 Rohingya refugees fleeing rape, genocide and years of persecution in Rakhine State, Myanmar to Bangladesh (UNHRC ,2018), and the genocide within Cambodia by the Khmer Rouge in the early 1970s. While governments support progress in health and the economy, history has shown that they can be perpetrators of the worst of human crimes against their people. This influences trust in power as well as the immediate capacity of communities to rebuild to face new challenges ahead. Community activism is described in global health as global public good and its application in Asia is no exception (Lo and Horton, 2015). Some observers describe Asia as in the “fork of the road” with uncertainty as to whether countries by and large will adopt more open or closed

economic policies, and more democratic or authoritarian political cultures. In all scenarios, the role of civil society and how their engagement is perceived, nurtured and engaged will be critical to the success of ecological sustainability and equitable development (Zarsky and Tay, 2000).

2.3.1 Climate change and health

Climate change has a range of implications for human health, with location-specific impacts dependent on numerous mediating factors, including environmental conditions, social infrastructure, and health system capacity to address emerging challenges (Smith et al., 2014). Climate change affects health via two main pathways. **Direct** effects are those caused by rising temperatures and increasing frequency and/or severity of natural disasters (*see* Box 2.1), and include heat- and cold-related impacts, and morbidity and mortality caused by floods and storms. Indeed, natural disasters have affected millions of people across the Asia Pacific region in recent years (*see* Box 2.1). **Indirect** effects are mediated by changes in *natural* systems and include vector-borne diseases, food- and water-related diseases, and the health impacts of air pollution such as cardiovascular and respiratory disorders. Indirect effects mediated primarily by changes in *human* systems include malnutrition, health impacts of forced migration and population displacement, mental health impacts, effects on occupational health (e.g. via heat exposure among outdoor workers) and health impacts caused by potential conflict resulting from climate-related stresses (Costello et al., 2009).

Vulnerability to the health impacts of climate change is highly context-specific and depends on a range of factors, including population demographics (particularly age and gender, with women, children and the elderly most at risk), baseline health status, socioeconomic variables, health system capabilities, and coexistent stressors such as conflict (Watts et al., 2015). Climate change is expected to exacerbate existing health and economic inequities (UNESCAP, 2018b). Addressing the health impacts of climate change presents major opportunities for human health and development (UNESCAP, 2018b), particularly in terms of the co-benefits of acting on climate change.

Box 2.1 Natural disasters

Across Asia and the Pacific, natural disasters have killed approximately 2 million people since 1970 (average of 43 000 per year but with wide interannual fluctuations). Most deaths are caused by earthquakes and storms, followed by floods. Droughts not directly associated with mortality have affected around 2 billion people across Asia Pacific since 1970 (UNESCAP, 2018b).

Disasters are highly disruptive. Huge displacements of people in recent years occurred from 2013 to 2015. Globally, disasters displaced 60.4 million people from 2013 to 2015, of which 52.7 million people were in Asia and the Pacific. The greatest numbers displaced were in the Philippines (15 million), China (13.1 million), India (9.2 million) but also large numbers in Bangladesh, Myanmar, Nepal and Pakistan (UNESCAP, 2018b). Cyclone Nargis that struck the Irrawaddy Delta region in Myanmar in May 2008 severely affected 2.4 million people and led to the displacement of 800 000 people (Tripartite Core Group, 2008).

2.3.2 Climate change, disasters and migration

International migration is a key determinant of social and economic conditions across the Asia Pacific region. It is estimated that, in 2013, there were more than 59 million international migrants across the Asia Pacific region, with most originating from Afghanistan, Bangladesh, China, India, Indonesia, Kazakhstan, Pakistan, the Philippines, the Russian Federation and Turkey. Most migrants move to neighbouring countries, or countries in the same subregion, and many are low-skilled temporary labour migrants. The main countries receiving migrants in Asia and the Pacific are Australia, China, India, Islamic Republic of Iran, Japan, Kazakhstan, Malaysia, Pakistan, Russian Federation and Thailand.

The Asia Pacific region hosted approximately 5.5 million refugees and “persons in refugee-like situations” in 2014, with most hosted by Turkey, Pakistan and the Islamic Republic of Iran, and most originating from Afghanistan and the Syrian Arab Republic.

There are five key drivers of migration (UNESCAP, 2015), which may be voluntary or involuntary (forced): economic, demographic, political, social

and environmental. In many cases, a multitude of factors are at play, and it can be difficult to attribute migration to any one condition. However, it is expected that migration driven by environmental changes will become more prominent in the coming years, for example, as rising sea levels affect residents of small islands, and as droughts become more frequent. Furthermore, displaced people are exposed to a range of environmental health risks; the example of conditions affecting Rohingya refugees in Bangladesh is provided in Box 2.2.

Of growing importance in the theme of displaced communities are the links between climate change adaptation and disaster risk reduction, given the clear overlap between these disciplines and the increasing threat of climate-related disasters (Banwell et al., 2018).

Box 2.2 Environmental health risks of Rohingya people in the camp context of Bangladesh

Abstract from paper published by Chan, Chiu and Chan (2018)

Complex emergencies remain major threats to human well-being in the 21st century. Displaced living in refugee camp settlements in Asia are associated with multiple environmental health risks. More than 0.3 million Rohingya people in Myanmar, one of the most forgotten minority communities globally (Mahmood et al., 2017), had fled to neighbourhood communities, mainly in Bangladesh during the past decades (Beyrer and Kamarulzaman, 2017; International Committee of the Red Cross, 2017; IOM, 2017; UNHCR, 2017; White, 2017).

Although clean drinking water points were available in some of those makeshift settlements, many refugees had to drill holes for underground water and some collected water directly from the river, with questionable water for basic hygiene (White, 2017). Water safety was compromised as people bathed, washed and practised open defecation in drinking water sources (Physicians for Human Rights, 2010). Water testing in settlements showed that 92% of the water was contaminated with *Escherichia coli* (*E. coli*) and 48% was regarded as highly contaminated (>100 cfu/100 mL) (WHO, 2017). Waterborne disease outbreaks such as cholera, bloody diarrhoea, typhoid and hepatitis E infection thus caused major concerns in the camps. Even though the United Nations Children's Fund (UNICEF)/World Health Organization (WHO) launched the

world's second-largest oral cholera vaccination campaign in October 2017 with 900 000 doses prepared for a vaccination campaign in Ukhiya and Teknaf, subdistricts of Cox's Bazar in Bangladesh, the gaps in refugee registration, fluidity of refugees and problems in vaccination record management would continue to affect the effectiveness of the campaign (Centers for Disease Control and Prevention, 2017).

Highly contagious fecal–oral diseases such as hepatitis A and E infections are also common. In refugee camps where settlers are predominantly young and with pregnant women, hepatitis E infection is a significant concern. In the region, hepatitis E infection outbreaks occur and Nepal reported 7000 cases in its 2014 outbreak (Shrestha et al., 2015). In displaced camp settings, hepatitis E infection was reported in Ethiopia in 2014/2015 and South Sudan in 2012/2013 (Centers for Disease Control and Prevention, 2015 & 2016). Although hepatitis E infection has yet not been reported in the Rohingya camps, reported cases of acute jaundice syndrome (AJS) appeared to be an increasing trend in certain specific settlements (WHO, 2017).

Overcrowding, indoor cooking practices, suboptimal constructed shelters with air-impermeable plastic sheets all contribute to fire and injury risks, poor indoor air quality and the proliferation of infectious diseases such as acute respiratory infections (ARI), measles and tuberculosis within the camps. ARI remained as the primary cause of death for camp residents.

2.3.3 Adaptation plans

In anticipation of climate change and adaptation needs, a total of 51 countries globally have submitted national adaptation programmes of action (NAPAs) to the United Nations Framework Convention on Climate Change (UNFCCC). The NAPAs were initiated in 2001 and were intended to support least developed countries to address urgent and immediate climate change adaptation needs (UNFCCC, n.d.).

More recently, countries have commenced the development of national adaptation plans (NAPs), which are designed to support planning for adaptation to climate change over the medium and long term. Some also have specific national health adaptation plans as part of NAPs (Watts et al., 2018). As of December 2017, ten countries had submitted NAPs to the UNFCCC, including Sri Lanka from the Asian region (UNFCCC NAP

Central, n.d.). In the Asia Pacific region, around half of the middle-income, developing countries are establishing processes to formulate and implement NAPs (National Adaptation Plan – Global Support Programme, 2017). Health considerations are integral to the NAP process, with adaptation planning providing opportunities to strengthen health systems, address the determinants of health risks, and improve collaboration between the health and related sectors (Ebi and Prats, 2015; WHO, 2014).

2.3.4 Towards resilient health systems

While much of the climate change and health narrative remains around adaptation, defined by the Intergovernmental Panel on Climate Change (IPCC) as “the process of adjustment to actual or expected climate and its effects” (Mach, Planton and Stechow, 2014), the health sector is increasingly taking a resilience-based approach to threats posed by climate variability and change. The concept of resilience is more comprehensive than that of adaptation and relates to the capacity of systems to cope with stresses and shocks while maintaining, and indeed improving, usual system structure and function.

WHO defines a climate-resilient health system as one that can “anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, to bring sustained improvements in population health, despite an unstable climate” (WHO, 2015). Developing resilience in health systems is an increasing priority across Asia, particularly given the existing vulnerabilities and disproportionate impacts in countries with limited capacity to adapt and respond (WHO Regional Office for South-East Asia, 2017). Critically, implementing resilience measures provides opportunities for improving sustainability in health system functions, for example, through the use of reliable, renewable energy sources in health-care delivery.

2.3.5 Planetary health, sustainable development and universal health coverage

Climate change is therefore both a threat to health and an opportunity to transform health systems and communities to be more sustainable and resilient. The scholarship and philosophy of planetary health to ignite a whole-of-society approach to human health, civilization and natural systems is synergistic with current global commitments in health such as

UHC and the SDGs. Moreover, acting on issues such as climate change has several specific co-benefits for health; that is, actions that help the planet also aid health. For example, shifts to active, more sustainable transport (walking, cycling, using public transport) and healthier plant-based diets promote improvements to both physical and mental health while reducing the burden on natural systems.

UHC offers a strong policy platform for improving health services for all, reducing inequalities and increasing resilience to climate change. The implementation of UHC creates opportunities to improve efficiency and sustainability within health systems, for example, by promoting access to quality preventive and primary health services, which reduce the demand for resource-intensive secondary and tertiary care. Delivery of UHC also provides opportunities for innovative, low-carbon approaches to health care, for example, through improved use of information and communication technologies. Also significant is the opportunity to develop health system infrastructure that is both sustainable and resilient to the impacts of climate change. Taking this approach, environmental sustainability becomes a core determinant of the equitable delivery of health care, particularly in under resourced and/or climate-exposed areas.

Like UHC, action on air pollution and climate change require multisectoral action. The health sector is well placed to lead by example, given health systems' intensive resource use, waste generation and greenhouse gas emissions, and the health co-benefits of "green" approaches to health system function and health service delivery. Indeed, improving the sustainability of health services can reap huge rewards. In the United Kingdom (UK), the National Health Service/Public Health England (NHS/PHE) Sustainable Development Unit found that greening initiatives (sustainable energy and building, and waste and food and water management) saved the NHS £90 million and cut 330 000 tonnes of carbon emissions across the health sector in 2017 (Sustainable Development Unit, 2018).

Many of the SDGs have links to planetary health, noting a range of priorities such as climate action, life on land and below water, sustainable cities and communities, and responsible production and consumption. However, since the signing of the SDGs in 2015, overall implementation needs to be scaled up because the region is going backwards on goals such as SDG 10 (reduced

inequalities) and SDG 16 (promoting peaceful and inclusive societies), although for the latter, data were limited. In response, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has proposed a range of strategies to tackle inequality (*see* Box 2.3). The United Nations Development Programme (UNDP) has recognized the important role of planetary health in achieving the SDGs (UNDP, 2017).

Box 2.3 UNESCAP 2018 proposed steps/responses to rising inequality

1. Strengthen social protection, including access to health care.
2. Prioritize education.
3. Protect the poor and disadvantaged from the disproportionate impact of environmental hazards.
4. Address the “digital divide” and information and communication technology (ICT) infrastructure.
5. Address persistent inequalities in technological capabilities among and within countries.
6. Increase the effectiveness of fiscal policies.
7. Improve data collection to identify and address inequality.
8. Deepen regional cooperation (UNESCAP, 2018c).

Regional progress has been the fastest for goals focused on social development and many Asian countries are making progress on these SDGs, including eradicating poverty, ensuring healthy lives/well-being and quality education. However, environmental stewardship needs to improve rapidly as there is inadequate progress towards sustainability, which will hamper all SDG progress. East and North-East Asia lead progress towards responsible consumption and production, but still emit more air pollutants than the regional average, and large disparities between countries threaten the ability to achieve the SDGs for the region overall, particularly for targets under Goals 8, 9, 13, 14 and 15. Data limitations are a major barrier to accurate measurement/monitoring (UNESCAP, 2017b). Low-income countries are more at risk of environmental degradation, as they are disproportionately affected by air pollution and natural disasters.

2.4 Reframing challenges: Planetary health in Asia

Planetary health is an opportunity to engage health systems, governments, the private sector, all disciplines and across all generations in a response to the immediate challenges posed by current Asian transitions. While it is still a nascent field in universities and global health, the language and aspirations of planetary health speak to several initiatives already in existence. Asian countries have a historical legacy of harmony between nature and humans in religion, philosophy and in how cities were organized. As societies modernized, some of these traditions were lost and hold global lessons in reviving and understanding them. Box 2.4 outlines some uniquely Asian expressions of progressive planetary health practices. This is not an exhaustive list and future documentation, using the lens of planetary health is needed to be able to draw key lessons.

Box 2.4 Asian expressions of progress in planetary health

China ecocivilization

In October 2017, President Xi Jinping's report at the 19th Chinese Communist Party National Congress called for the building of an ecocivilization that would benefit generations to come. "Ecocivilisation will ensure harmony between man and nature and that humans must respect nature, follow its ways and protect it." The administration plans to encourage simple, moderate, green and low-carbon ways of life, and oppose extravagance and excessive consumption. Although not explicitly stated, the Chinese Government's "Belt and Road" initiative, enhancing connectivity in transport and trade between Eurasian countries and China, is potentially an opportunity to also exchange across countries the lessons and projects that are under way to create a Chinese ecocivilization.

Japanese forest bathing

The Japanese practice of forest bathing – being in the trees – has become part of a national public health programme. In 1982, the forestry ministry coined the phrase *shinrin-yoku* and promoted being near trees as therapy. The point is to relax rather than do strenuous physical activity. It has been shown to reduce stress hormone production and improve overall well-being (Park et al., 2009).

Healthy Cities China

The Tsinghua Lancet Commission on Healthy Cities published in 2018 (Yang et al., 2018) looked at understanding and addressing urban health challenges in the unique context of rapid urbanization in China. The report examined the environmental and social determinants of health and identified the importance of aligning with the national campaign Healthy China 2030. Health in all policies and cross-industry collaboration were recommended. A unique aspect of the process followed by this Commission was the use of crowd sourcing as a method of involving community participation online to imagine the cities people want.

Greening of health systems

China, Indonesia, Nepal and Philippines all currently participate in the Global Green and Healthy Hospitals Initiative (GGHI), which is an international network of hospitals, health organizations and facilities aiming to reduce their environmental footprint and protect public and environmental health (Global Green and Healthy Hospitals, n.d.). The recognition of primary care services as integral to planetary health practice has been noted (Xie et al., 2018).

Satoyama/Satoumi landscapes in Japan

Satoyama and Satoumi landscapes are socioeconomic systems in Japan that have a legacy of centuries of care and interaction between locally sustainable lifestyles and a rich natural environment. The cultural heritage of these landscapes is inextricably linked with the Japanese identity; however, the use of fossil fuels and chemical fertilizers threaten these forests. Depopulation is also an issue as fewer people are left to manage the landscape. In 2007, the Japanese Cabinet endorsed the 21st Century Environmental Nature strategy proposing a low carbon society, a material cycle society and one in harmony with nature (United Nations University, 2010).

Some Asian countries have implemented reforestation strategies in recent years, including China, India, Japan and Viet Nam; China, for example, increased its forested area by 31.3 million hectares between 2000 and 2015 (United Nations University, 2010). There is in general growing recognition of the unique contribution Asia makes globally to living landscapes connected to local communities (Vaz and Aphinives, 2014).

2.5 Recommendations and guiding principles for planetary health in Asia

The challenges posed by these Asian transitions will require different but linked intersectoral approaches, and visionary political leadership willing to build for generations to come. At the same time, Asia holds many positive examples and commitments to improve on the current status quo. Planetary health offers opportunities for six key stakeholders: health professionals, academic researchers, UN institutions, governments, investors and corporate reporting bodies, and civil society. Planetary health offers the themes of knowledge, governance and imagination to address these challenges before us and scale up and share the models that work. The principles of intergenerational equity and transdisciplinary approach are universal.

2.5.1 Knowledge

Education in universities and schools should strive to be planetary health-ready, already adapting not only health curriculums but also universitywide reforms towards transdisciplinary knowledge and research. Several universities in the region are already leaders in different related areas of planetary health scholarship: Tsinghua University in Beijing, Chinese University of Hong Kong, University of Tokyo, United Nations University in Kuala Lumpur, and National University of Singapore. Both funding structures and the way in which universities are organized can be oriented towards more planetary-positive expectations of future generations. For example, the University of Sydney is attempting to integrate a planetary health theme across all faculties and expertise. Research gaps should not limit action and, where possible and identifiable, technological solutions that both produce scientific advances and co-benefits to health and the planet should be fast-tracked in a system that allows rapid scale up and evaluation of successful projects.

2.5.2 Governance

Commitment to the SDGs and UHC can be aligned with emerging planetary health and climate change and health policies. In terms of the

Asian transitions, specific areas of debate within policy and university forums are offered.

Economic transition. Can Asia and the world move to a different definition of development and prosperity? For example, communities could promote circular economies with overall less consumption and reduction of waste. Divesting from fossil fuels is a way that citizens have been able to move their own investments towards a healthier future. Governments could take advantage of the current favourable economic conditions and of opportunities to address vulnerabilities, and increase resilience, inclusiveness and sustainability.

Urban transition. How can cities be planned, designed, developed and managed to maximize human health and the health of natural systems?

Ecological transition. How to protect Asia's natural assets and at the same time offset the massive environmental assaults launched by plastics, air pollution, and water and food system contamination? Selected policy approaches to protect biodiversity include improved management of protected areas, including enforcement of regulations; community-based ecosystem management programmes; restriction of deforestation and other means of destructive land-use change; and valuation of natural capital and ecosystem services in national and international accounts (WHO and Secretariat of the Convention on Biological Diversity, 2015).

Energy transition: moving towards a renewable energy region. Many countries have made commitments but, in 2040, even China will still be 42% reliant on coal. How can this be addressed while moving towards renewables?

Nutrition transition. Addressing the drivers of malnutrition and obesity will require action for sustainable and healthy agrifood systems, marketing and trade, as well as on poverty and inequity.

2.5.3 Imagination

Planetary health is for every individual and sector to voice a claim to. A regional intergenerational people's movement backed by national legal or constitutional changes to enforce their call to action would allow for a

transparent and equitable way for all to engage. It is up to Asia to provide regional solutions and local innovations, drawing on both ancient practices and knowledge unique to the region, as well as facilitating the involvement of people in the future of their health and the natural environment that supports them.

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Chapter 3. Addressing NCDs in Asia through a health systems lens: Major challenges and the way forward

Melisa Mei Jin Tan, Victoria Elizabeth Haldane, Sue-Anne Toh, Martin McKee, Helena Legido-Quigley



3.1 Introduction

NCDs pose a growing challenge to health and well-being in Asia and globally (WHO, 2016a). With an estimated population of over 4 billion, spanning more than 26 nations, Asia offers a diverse landscape to examine national responses to NCDs across a spectrum of political, economic, social and geographical settings.

This wide spectrum of settings influences how health systems are funded and delivered. Every Asian country is in the midst of a demographic transition, albeit at different stages, but all characterized by population ageing; a trend that is expected to continue throughout Asia, with profound implications for the management of NCDs (UNESCAP, 2017). The situation is complicated by the scale and nature of ongoing internal and external migration within Asia, creating a dynamic transnational social landscape, including different types of migration, which challenges the ability of health systems to respond to the resulting changes in the burden of NCDs (IOM, 2010; Oyeboode et al., 2015).

Geography is another consideration. In this book, we define Asian countries as those so categorized by the United Nations (2017). They include fragmented archipelagos, vast plains and remote mountainous regions. However, all Asian governments face challenges in ensuring access to and continuity of NCD care in rural settings. Many have sought to strengthen primary health care (van Weel et al., 2016), while more ambitious ideas include the use of m-Health, with its purported potential to provide new ways to manage NCDs (Hegde et al., 2018; Ni et al., 2014; WHO Regional Office for the Western Pacific, 2017a). At the same time, the growth of periurban areas and megacities in Asia, with mass migration from rural settings into cities, poses other challenges (IOM, 2014; UNESCO, 2018), particularly when combined with demographic transition (Khan et al., 2013). However, cities also offer opportunities for innovative strategies for NCDs through new thinking on urban planning and design (Singapore MoH, 2014).

While geographical, economic and political contexts vary greatly across Asia, the immediate risk factors for NCDs are broadly similar everywhere, even if the burden of disease that they cause varies. This offers

opportunities for collaboration among Asian nations to develop approaches that are contextually appropriate. For example, the ASEAN, a grouping of ten member states working together to promote peace and stability in the South-East Asia region, has included NCDs as an exemplar of the need for regional cooperation (ASEAN, 2017) and has launched initiatives such as the ASEAN NCD Network, which seeks to bring together multiple sectors and stakeholders to address NCDs, including promotion of healthy lifestyles (ASEAN, 2017; Lim et al., 2014).

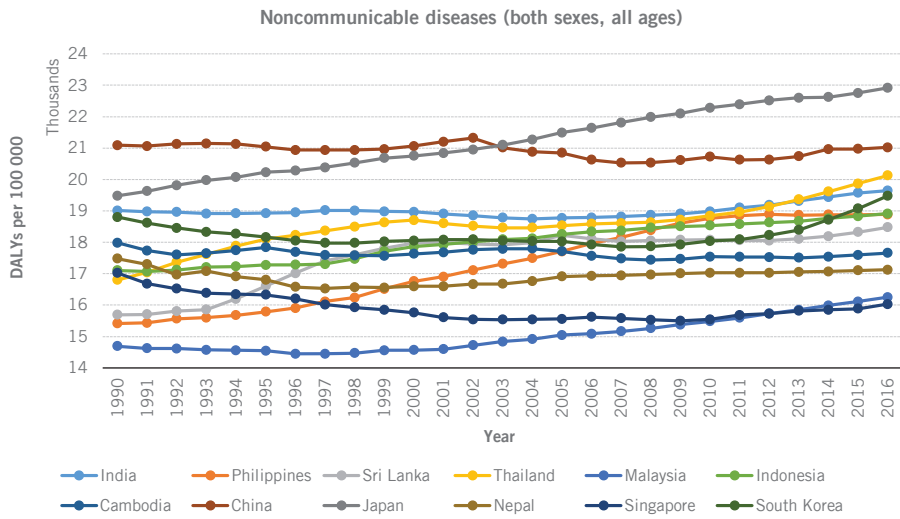
This chapter presents an overview of the challenges and opportunities posed by NCDs in Asia and the responses adopted. It explores the diversity of factors of health systems and offers insights into the performance of health systems by exploring quality, people-centredness and resilience. This is illustrated by a series of case studies that exemplify the innovative approaches used across the region for the prevention, treatment and management of NCDs.

3.2 Overview and burden of NCDs in Asia

NCDs are the leading cause of death worldwide, accounting for 40.5 million deaths in 2016, 52% (21 million) of which occurred in the WHO South-East Asia and WHO Western Pacific regions. Additionally, significant reductions in DALYs due to NCDs for countries in the WHO South-East Asia and WHO Western Pacific regions have yet to occur (Fig. 3.1). DALYs in NCDs for the WHO Western Pacific Region, for example, contribute to at least 80% of all-cause DALYs (WHO, 2018). These numbers will continue to increase in the foreseeable future. The WHO South-East Asia Region has seen the number of deaths increase from 6.3 million NCD deaths in 2000 to 9.1 million NCD deaths in 2016, while the WHO Western Pacific Region has similarly seen a rise from 8.6 million to 11.9 million deaths (WHO, 2016b). Globally, four broad categories of NCDs account for the majority of NCD deaths – CVDs (17.5 million deaths), cancers (8.2 million deaths), respiratory diseases (including asthma and chronic obstructive pulmonary disease [COPD]; 4 million deaths) and diabetes (1.5 million deaths) (WHO, 2014). Other important contributors to the burden of NCDs, particularly disability, including mental disorders, with an estimated 151.88 million cases of depression alone in the WHO Western Pacific and WHO South-East Asia regions (WHO, 2017a); and road traffic accidents and injuries,

responsible for the largest proportion of deaths in those aged 15–29 years in the WHO South-East Asia Region (WHO Regional Office for South-East Asia, 2015).

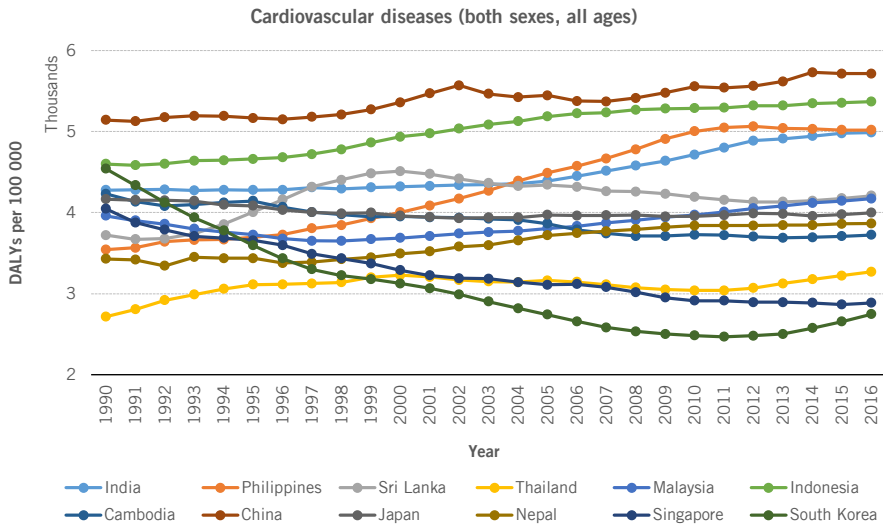
Fig. 3.1 DALYs per 100 000 due to NCDs for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016



Source: Institute for Health Metrics and Evaluation, 2018

CVDs are the leading cause of premature death globally and about half of the burden of CVDs is estimated to occur in regions in Asia (Vos et al., 2016). While some countries, such as Japan, the Republic of Korea and Singapore have seen decreasing death rates from CVDs, others, such as some Central Asian and South Asian nations, have either failed to reduce rates or, in some cases, have seen increases (Ohira and Iso, 2013). There has also been a significant reduction in DALYs due to CVDs by close to half over the past decades in countries such as the Republic of Korea (Fig. 3.2). Even where age-specific death rates are falling, the number of cases is often increasing because of population growth and ageing.

Fig. 3.2 DALYs per 100 000 due to CVDs for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016



Source: Institute for Health Metrics and Evaluation, 2018

The burden of CVDs in a population reflects a range of proximate and distal risk factors. Among the former, hypertension is one of the commonest, yet easily treatable. Comparable data on risk factors and outcomes among those aged 35–70 years are available in several Asian countries from the Prospective Urban and Rural Epidemiology (PURE) study. Table 3.1 shows the prevalence of hypertension (blood pressure more than 140/90 mmHg or on treatment) in participants in the PURE study (Palafox et al., 2016). Among those who have experienced a CVD event, the risk of recurrence can be reduced by medicines for secondary prevention. Again, the PURE study has revealed levels that are suboptimal. Thus, among those who have experienced an event, a relatively small proportion were taking three or more of the recommended four classes of medications. In Asia, the percentages were as follows: Bangladesh (1.3%); China (0.9%); India (2.5%); Iran (19.2%); Malaysia (7.6%); Pakistan (0.8%); and the Philippines (2.3%) (Murphy et al., 2018).

Table 3.1 Prevalence of hypertension in participants of the PURE study (extracted countries in Asia only)

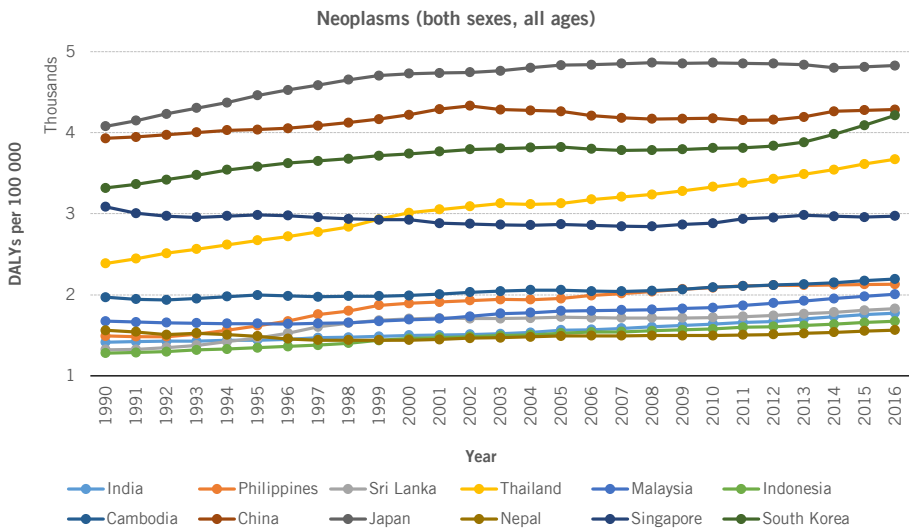
Country	No. of participants	No. with hypertension – standard lower threshold (%) [95%CI]		Hypertensive participants – standard lower threshold									
				No. aware (%) [95% CI]			No. treated (%) [95% CI]			No. controlled (%) [95% CI]			
Malaysia	11 825	5509	-46.6	[43.9–49.3]	2648	-48.1	[45.3–50.9]	2272	-41.2	[38.1–44.5]	690	-12.5	[10.9–14.3]
China	46 751	19 471	-41.6	[39.2–44.1]	8114	-41.7	[37.5–46.0]	6557	-33.7	[29.3–38.4]	1556	-8	[5.9–10.7]
Philippines	1671	855	-51.2	[43.3–59.0]	466	-54.5	[29.1–77.8]	394	-46.1	[21.0–73.3]	115	-13.5	[3.8–37.7]
Iran	6013	1598	-26.6	[23.6–29.8]	841	-52.6	[45.7–59.5]	816	-51.1	[44.5–57.6]	293	-18.3	[13.4–24.6]
Bangladesh	2747	1080	-39.3	[36.1–42.7]	261	-24.2	[20.3–28.5]	174	-16.1	[13.1–19.7]	43	-4	[2.6–6.0]
India	27 458	8473	-30.9	[28.5–33.4]	3565	-42.1	[38.1–46.2]	2843	-33.6	[29.9–37.4]	1159	-13.7	[11.1–16.7]
Pakistan	1294	435	-33.6	[25.8–42.4]	206	-47.4	[39.2–55.6]	162	-37.2	[28.7–46.6]	76	-17.5	[12.9–23.2]

Source: Palafox et al., 2016

Asia (South, East and South-East) accounts for 6.4 million cases of cancer, 44% of the global total, and 51% of all cancer deaths, with China contributing the largest burden of cancer in the region (American Cancer Society, 2013) and one of the top two countries with rising DALYs due to cancer (Fig. 3.3). It is estimated that the incidence of cancer cases in the region will increase from 6.1 million in 2008 to 10.7 million in 2030; similarly, cancer deaths are expected to increase from 4.1 million to 7.5 million (Ferlay et al., 2010). The most common sites of cancer in this region among men are the lung, stomach, liver, colon/rectum and oesophagus; and in women the breast, lung, stomach, colon/rectum and liver (Vos et al., 2016); however, as expected, the pattern varies among countries. Among women in the most developed Asian countries, cancers of the breast, lung and colon/rectum were more common, while in less developed countries cancer of the cervix was more common (Bray et al., 2012). There

is great variation across Asia in the availability and quality of cancer care, with HICs, such as Japan, the Republic of Korea and Singapore having well-developed health service delivery, from screening to palliative care. These services are, however, much less developed in many other regions in Asia (Sankaranarayanan et al., 2014).

Fig. 3.3 DALYs per 100 000 due to cancers for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016



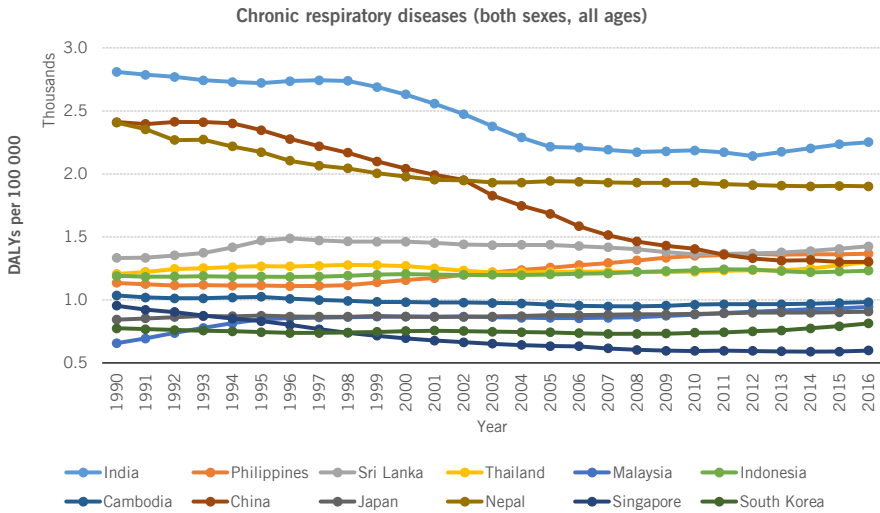
Source: Institute for Health Metrics and Evaluation, 2018

Respiratory diseases are also an important contributor to the burden of NCDs in this region. The major risk factors for respiratory disease in Asia are tobacco smoking, infection and air pollution (Jamrozik and Musk, 2011; Vos et al., 2016). While infectious diseases still make an important contribution in some countries, smoking and air pollution, leading to lung cancer and COPD, as well as asthma and occupational lung diseases pose an increasing burden (Vos et al., 2016). The importance of tobacco in Asia cannot be overstated; the WHO Western Pacific Region is home to an estimated 250 million smokers and a similar number use smokeless tobacco products in the WHO South-East Asia Region (WHO Regional Office for

South-East Asia, 2012; WHO Regional Office for the Western Pacific, 2018a). Overall, Asia consumes more than half of the tobacco consumed globally and the majority of annual global tobacco deaths are in Asia (Mackay et al., 2013). This region has been targeted aggressively by global tobacco corporations, taking advantage of trade liberalization, as in Viet Nam (Lee et al., 2008) and, before that, China (Lee et al., 2004), seeking to maintain their sales at a time when they are experiencing marked falls in Europe, North America and Australasia. While there are some exceptions, these corporations have benefited from relatively weak anti-tobacco organizations and policies in many Asian countries, as well as by circumventing policies such as taxation by their extensive complicity in smuggling (Collin et al., 2004).

Countries in the WHO Western Pacific Region contribute 2.2 million of the world's 7 million annual premature deaths from air pollution (WHO Regional Office for the Western Pacific, 2018b), with China making significant progress in reducing DALYs over the past few decades, from 2411 DALYs per 100 000 in 1990 to 1303 DALYs per 100 000 in 2016 (Fig. 3.4). There are two major sources, which differ in their distribution. In low-income countries, there is a persistent problem from indoor air pollution, due mainly to the use of biomass fuels in inadequately ventilated dwellings. All countries, especially in urban areas, suffer from various forms of ambient air pollution from industrial and vehicle emissions. Asia (including South Asia) accounts for 65% of the total years of life lost due to air pollution worldwide (Vos et al., 2016). The threat posed by indoor air pollution is especially severe in places such as rural China and Mongolia (Lin et al., 2008). With rapid urbanization and more than 60% of megacities expected in Asia by 2025, the impact of ambient air pollution is expected to rise sharply over the next few decades (Global Data, 2018; Lelieveld et al., 2015; Pope et al., 2011).

Fig. 3.4 DALYs per 100 000 due to chronic respiratory diseases for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016

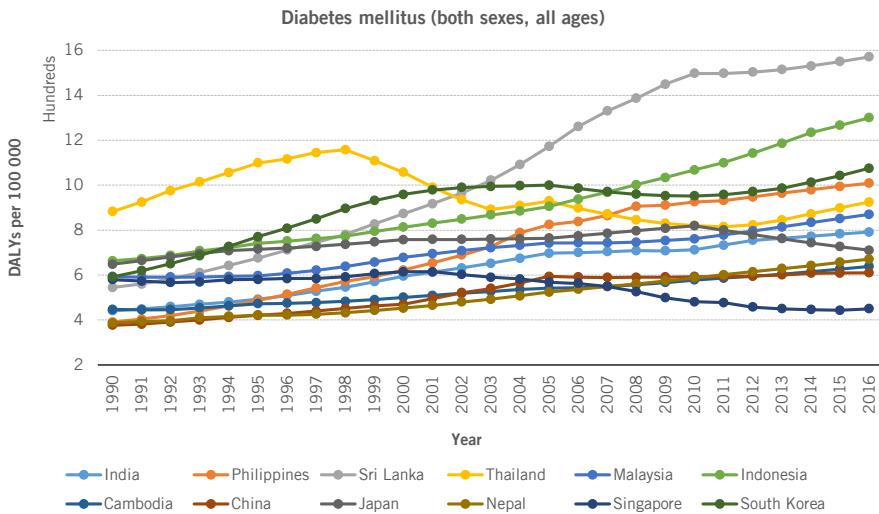


Source: Institute for Health Metrics and Evaluation, 2018

It is estimated that there are 382 million persons living with diabetes worldwide, and of these, more than 60% live in Asia, with almost one third in China (Guariguata et al., 2014; Shaw et al., 2010). It is predicted that between 2000 and 2030, the number of people living with diabetes will increase by 114%, with China and India bearing a large share of this disease burden (Wild et al., 2004). Some Asian populations, especially in the Indian subcontinent, tend to develop the disease at a younger age, at lower levels of obesity, suffer more complications and die sooner than those living in other regions (Yoon et al., 2006). Nations across Asia are undergoing rapid economic and social transitions with consequences for the risk factors for diabetes. A particular threat is the influx of high-energy sugar-sweetened beverages and so-called “junk foods”, energy-dense ultra-processed products. Many of these are marketed aggressively by global corporations, using techniques similar to those used by the tobacco industry, exploiting the lack of health safeguards when trade policies are liberalized (Stuckler et al., 2012). Other societal changes also promote a sedentary lifestyle (Misra et al., 2014; Ramachandran et al., 2014). The prevalence of diabetes is substantially higher in urban than rural areas, but this gap is now narrowing, as exposure to risk factors in rural areas increases (Chan et al., 2009; Ramachandran et

al., 2008; Ramachandran et al., 2010). The confluence of these factors and increasing rates of diabetes with lack of reduction in DALYs due to diabetes (Fig. 3.5) pose significant challenges to health systems in the region and point to the importance of action to tackle the upstream drivers of this epidemic, in particular, the widespread marketing of energy-dense food and beverages (Stuckler and Nestle, 2012). However, while such upstream policies should form the core of comprehensive policies, encompassing actions that tackle the price, availability and marketing of these products and the power of those who manufacture and sell them, there may also be some complementary role for individualized lifestyle modification interventions if they can be scaled up and sustained beyond the initial research studies. Examples include the Da Qing studies in China, the Indian Diabetes Prevention Programme (IDPP) and the Japanese prevention programme (Kosaka et al., 2005; Li et al., 2014; Pan et al., 1997; Ramachandran et al., 2006; Saito et al., 2011). While implementation has often proved difficult due to challenges such as costs and shortage of health workforce (Milat et al., 2013), solutions that leverage on technology offer cost-effective means to narrow gaps in execution (Gupta et al., 2016; Kwan, 2013).

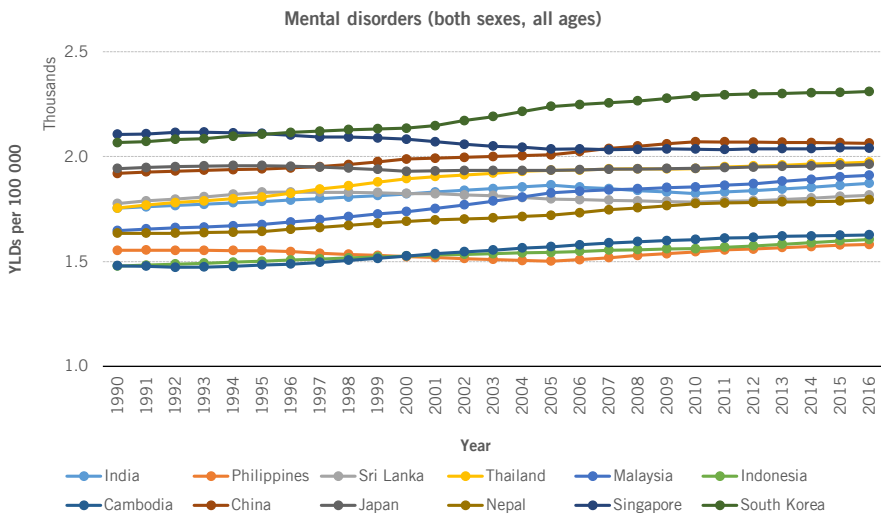
Fig. 3.5 DALYs per 100 000 due to diabetes mellitus for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016



Source: Institute for Health Metrics and Evaluation, 2018

Mental health, neurological and substance use disorders are increasingly important public health challenges in Asia, as elsewhere, and are the leading cause of years lived with disability globally (Vos et al., 2016). Over the past 30 years, there has been no improvement in the number of years of life lost for mental disorder in Asia (Fig. 3.6). The China–India Mental Health Alliance reported that China and India together had 66 million DALYs attributable to these conditions, more than all of the developed countries combined, and predicted that the burden attributable to these disorders would increase in both China (by 10%) and India (by 23%) between 2013 and 2025 (Charlson et al., 2016). Yet, despite their importance, there is little robust evidence about the extent to which those in need in Asian countries are able to access care from mental health providers and what evidence exists suggests great regional variation in resource availability and quality (Patel et al., 2016). This treatment gap may be as

Fig. 3.6 Years lived with disability per 100 000 due to mental, neurological and substance use disorders for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016

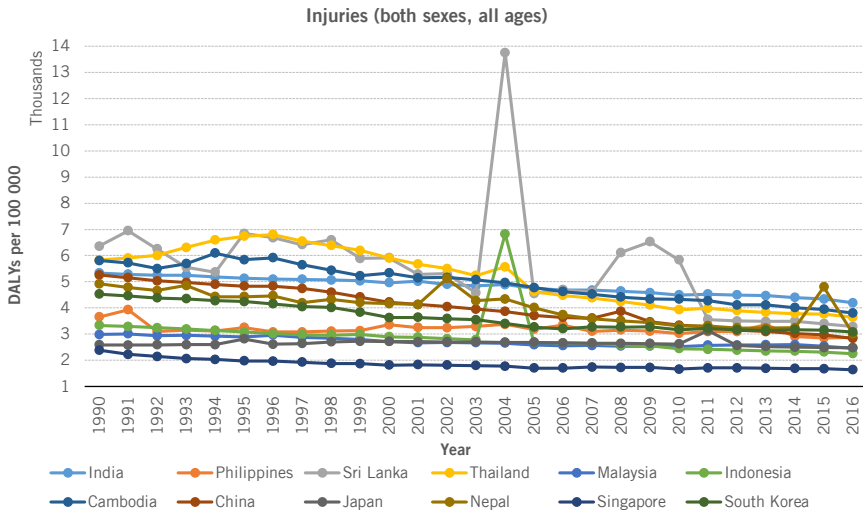


Source: Institute for Health Metrics and Evaluation, 2018

high as 90% in low-resource settings (Lora et al., 2012). Limited availability of care is compounded by the stigma associated with mental, neurological and substance use disorders in many Asian cultures, impeding access and adherence to treatment (Lauber and Rössler, 2007).

It is estimated that injuries accounted for 4.6 million deaths, i.e. 8.6% of total deaths, globally in 2016, with transport injuries as the main causes (Vos et al., 2016). Road traffic accidents, injuries and deaths accounted for 334 815 deaths in the South-East Asia Region in 2010, 50% of which were of vulnerable road users (motorized two- or three-wheelers, pedestrians and cyclists) (WHO Regional Office for South-East Asia, 2013). While there has been a notable reduction in DALYs such as in China and Thailand (Fig. 3.7), other studies from China, the Republic of Korea and Thailand also point to the high burden of morbidity and mortality borne by vulnerable road users, where motorcyclists account for a high proportion of seriously injured road users (Suriyawongpaisal and Kanchanasut, 2003; Wang et al., 2003; Yang

Fig. 3.7 DALYs per 100 000 due to injuries for selected countries of the WHO South-East Asia and WHO Western Pacific regions, 1990–2016



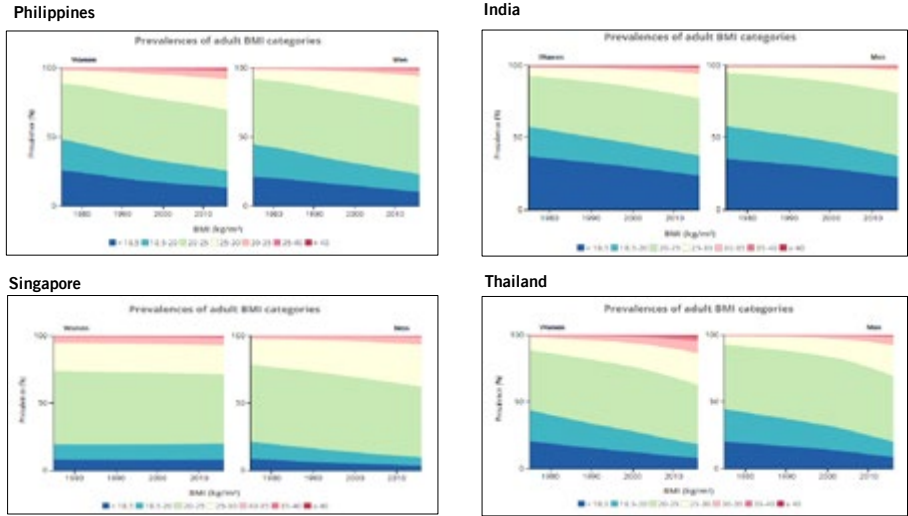
Source: Institute for Health Metrics and Evaluation, 2018

and Kim, 2003). These preventable injuries and deaths disproportionately impact adolescents, with road traffic injuries being the leading cause of death among young men (WHO, 2017b). Another notable concern is injuries post disaster such as the Indian Ocean tsunami in 2004, leading to a sudden spike in DALYs in Indonesia and Sri Lanka (Ramalanjaona, 2011) and compounded by the existing conflicts within each of these countries (Hyndman, 2009). Challenges that disaster-prone countries face are not only for reconstructing infrastructure, there is also a need to ensure preventive measures. For example, Indonesia implemented disaster reduction education to enhance emergency preparedness (Suppasri et al., 2015).

NCDs do not occur in isolation and, as elsewhere, increasing numbers of people have multimorbidity. This underscores the need for more integrated and person-centred health service delivery (Academy of Medical Sciences, 2018; Vos et al., 2016). Furthermore, many of the commonest NCDs share risk factors, such as obesity (Fig. 3.8), which are increasing in Asia (NCD Risk Factor Collaboration, 2017; Ramachandran and Snehalatha, 2010). The metabolic syndrome, a cluster of conditions that include obesity, impaired glucose tolerance, high blood pressure and lipid disorders, places individuals at an increased risk of developing NCDs (Alberti et al., 2009). The increasing prevalence of the metabolic syndrome and diseases such as type II diabetes mellitus means that health systems in Asia need to have mechanisms in place to be able to manage all of the needs of the patient (Zimmet et al., 2001). Importantly, there is increasing recognition of how mental, neurological and substance use disorders cluster with a variety of NCDs, as well as with chronic infectious diseases such as HIV, thus creating further impetus for integrated and holistic care of these conditions (Patel and Chatterji, 2015).

As the burden of NCDs and, consequently, multimorbidities increase in Asia, health systems are tasked with responding to the multiple challenges arising and the complex social, political and geographical environments in which they occur. The diversity of Asia's development landscape offers numerous opportunities to identify and contrast approaches adopted by different countries, and to highlight lessons and ways forward.

Fig. 3.8 Prevalence of adult body mass index (BMI) categories in selected countries



Source: NCD risk factor collaboration, 2017

3.3 Health system responses to NCDs in Asia

Against this backdrop of an increasing burden of NCDs across Asia, it is important to understand the varied ways in which health systems organize, deliver services and provide care. There is a diversity of ways in which the unique mix of low-, middle- and high-income countries in Asia have leveraged their national systems to address NCDs. This section analyses the responses of national systems, drawing on the six building blocks used in the WHO Health Systems Framework (WHO, 2007).

3.3.1 Leadership and governance

The prevention and management of NCDs is complex. They require a mix of initiatives, including medical (i.e. treatment for NCDs), behavioural (i.e. health-promoting measures) and political/ economic (e.g. actions on price, availability and marketing of harmful substances). Given the wide range of potential measures, effective governance depends on coordinated responses

based on multisectoral collaboration between governments, civil society, academia, industry and communities, shared common values to co-produce health, and engagement of patients and the public (Kickbusch and Gleicher, 2012). Reflecting the right to UHC, restated in the SDGs, health services should be provided equitably, reducing the risk of catastrophic expenditure by afflicted individuals and families.

The governance of health systems, as it relates particularly to NCDs, varies across Asia. While, within a country, the government must ultimately be accountable for policy, it acts within an international framework. WHO, as the UN specialized agency with lead responsibility for health, has developed a Global Action Plan for the Prevention and Control of NCDs 2013–2020. Policies of many other UN and global agencies, such as the WTO, the Food and Agriculture Organization, and the International Labour Office also play a role. Health ministries are often guided by WHO policies. Occasionally, they may make more explicit commitments, such as when WHO used its treaty-making power to negotiate the FCTC. National policies cascade downwards, in ways determined by the administrative structures of the country concerned, involving different sectors as appropriate. Society at large is both a beneficiary and participant of this diffused governance.

In ASEAN countries, there are examples of innovative approaches to the management of NCDs, involving local leadership; strengthening interdisciplinary partnerships; measures to promote community ownership of innovative strategies; improved recognition of the needs of people and ways to provide services to meet them; and raised awareness through capacity-building and health literacy (Lim et al., 2014). We present examples from three countries – Japan, Singapore and Sri Lanka. These countries are experiencing similar trajectories of an ageing population. While different in geographical size, they exhibit some commonalities in their approaches to preventing and treating NCDs, in particular, their use of a multisectoral approach that reaches beyond government (Box 3.1).

Box 3.1 Examples of innovative approaches to the management of NCDs in Asia

Engaging in community settings: the case of Japan

The Japanese Government enacted a Long-term Care Insurance Act in 1997 and a Health Promotion Act in 2004 (Sakamoto et al., 2018). The former has attracted considerable attention internationally. Japan also adopted a multisectoral response to NCDs, Health Japan 21 (HJ21) (Ezoe et al., 2017). It provides guidance to prefectures for development of “Prefectural Health Promotion Plans”. These measures emphasize community participation (Bayarsaikhan, 2008). One small-scale example that has been reported involves “community salons”, a community-based intervention programme developed in Taketoyo town in Aichi Prefecture. It seeks to promote social interaction among elderly residents through social activities, such as games and interactive activities with preschool children. Residents above the age of 65 years are eligible to participate with a nominal fee of 100 yen (about US\$ 1) per visit. Research evidence suggests that such community-based interventions can be effective and viable options for preventing the onset of functional disability among the elderly (Hikichi et al., 2015).

The War on Diabetes in Singapore

The War on Diabetes programme was launched in 2016 following a report that the country would have 1 million persons with diabetes by 2050 (Khalik, 2016; Phan et al., 2014). This whole-of-government and whole-of-nation strategy includes dialogue and engagement with multiple sectors such as academic researchers, health-care practitioners, the private sector (e.g. food and beverage industry), advocacy organizations, non-health governmental agencies (e.g. education), and citizens to commit to a multisectoral plan to better prevent, treat and manage diabetes. Before the War on Diabetes programme was launched, the Healthy Living Master Plan was released in 2014 and it was already the result of public consultations and multisectoral collaboration (Singapore MOH, 2014). Other key examples of NCD programme interventions include the Screen for Life programme to increase the affordability of screening for chronic diseases (Goh, 2017; Teo, 2017); the Healthier Choice Symbol to nudge consumers towards healthier food; and the National Steps Challenge to incentivize individuals to increase physical activity (Health Promotion Board, n.d.). The Healthier Ingredient Development Scheme is an upstream effort to support the local food industry’s uptake of healthier ingredients in the food service sector (Health Promotion Board, n.d.). However, these initiatives have not yet been evaluated in academic journals.

The introduction of national policies to combat NCDs in Sri Lanka

Sri Lanka is faced with a growing burden of NCDs and an ageing population. To respond to these trends, the government has developed several frameworks such as the National Policy and Strategic Framework for Prevention and Control of Chronic NCDs and the National Plan of Action on Ageing 2012–2021 to combat NCDs and promote healthy ageing. Healthy Lifestyle Centres were established in 2011, using standardized protocols to screen patients for risk factors by, for example, measuring BMI (Mallawaarachchi et al., 2016). Those with a 10-year CVD risk of more than 30% are then referred to specialized clinics for further management. Another example is the launch of well women clinics in 1996 to screen women above the age of 35 years for NCDs such as breast cancer, diabetes mellitus and hypertension (Vithana et al., 2013). However, the uptake has been very poor. For example, breast screening, which employed clinical rather than mammographic examination, achieved only a 2.2% uptake 11 years after its inception. Notwithstanding this trend, it is important to highlight that Sri Lanka provides free preventive and curative care services in the public sector.

3.3.2 Health-care financing

Financing for health systems, including NCDs, comprise national health insurance schemes and general government revenues, although in many countries there is still considerable out-of-pocket spending and resulting catastrophic expenditure. The most effective strategy for raising funds is through taxation, employing measures that are progressive, falling most on those with the greatest ability to pay (Reeves et al., 2015). We present two examples, from Japan and Thailand, of recent developments in financing (Box 3.2).

Box 3.2 Examples of type of health-care financing in Japan and Thailand

Japan

Insurance premiums, coupled with tax subsidies, are the primary source of funding for Japan's health system (Zhang and Oyama, 2016). The private sector plays a major role in Japan's health-care delivery system, although all providers work within a national fee system. Public spending is more than four fifths of the total health expenditure (Sakamoto et al., 2018).

A government-controlled single-payment model has contributed towards UHC, with high-quality care at low cost (Wu et al., 2017). Japan has created eight insurance schemes categorized into two main groups, employees' health insurance for the working population based on their occupation, and national health insurance for those not falling into the first category (The Economist Intelligence Unit, 2016). The vast number of about 3500 insurers function under a single payment system regulated by the government (Sasaki et al., 2015). The long-term care insurance scheme funds the care of elderly people from premiums paid by income-earners aged 40 years and above (Campbell and Ikegami, 2000; Sakamoto et al., 2018).

Thailand

Public health-care facilities have been expanding markedly in Thailand since 1961, in part compensating for the concentration of private facilities in urban areas (Sakunphanit, 2008). Government expenditure comprises three quarters of the total health spending, with the remaining covered by private health expenditure and minimal external sources (Tangcharoensathien et al., 2010). Over the past two decades, two health reforms were designed to provide the Thai population with access to health-care services while minimizing financial hardship, as well as to finance health promotion activities.

First, in 2002, the UHC scheme was launched to cover the 75% of the population who were then not covered under the Civil Servant Medical Benefit Scheme for government employees (9%), and the Social Security Scheme for private sector employees (16%) (Paek et al., 2016; Tangcharoensathien et al., 2010). In addition, private health insurance functions as a supplementary mechanism for those who could afford to pay premiums. During this period, when Thailand was seeking to recover from the 1997 Asian financial crisis, public funding continued to grow gradually from 54% (1997) to 77% (2011).

Second, a 2% surcharge was levied on tobacco and alcohol excise tax and duty to fund the Thai Health Promotion Foundation (Thai Health) (Galbally et al., 2012). ThaiHealth carries out a range of health promotion activities in different sectors (Adulyanon, 2012; Jongudomsuk et al., 2015).

National action plans can help structure the response to NCDs but sustainable budgets and strong political will are needed. Taxation is a key element of any response to the harmful substances that contribute to NCDs. Although strongly opposed by corporate interests, with their lobbyists arguing, wrongly, that it is ineffective or hurts the poor most, the evidence supporting them is overwhelming, as set out in a recent highly cited Lancet paper (STAX Group, 2018). In some cases, the funds raised have been retained to fund health promotion programmes, as in Thailand, which levied a 2% surcharge on tobacco and alcohol excise tax and duty to fund a health-promoting body, i.e. ThaiHealth. Nepal implemented a tax on cigarettes and used the funds for the national cancer hospital (WHO, 2008). Revenue from a sugar tax in the Philippines has also raised substantial funds that have been used to support the health system. Yet while taxes on harmful products can provide a short-term funding boost for health-related causes, they should not be relied on. First, the public health community can become dependent on continuing sales of the products concerned, which may make some people less enthusiastic about adopting other measures to reduce consumption, a view that will inevitably be supported by producers of those products. Second, it confuses the goal, which should be to reduce the amount of the product sold rather than to raise money. Thus, an effective policy would be one such as the sugar tax in the UK where much of the success of the policy was due to reformulation by manufacturers to avoid the tax, thereby reducing consumption without impacting on consumers. Box 3.3 illustrates the progress with sugar taxes in Asia.

Box 3.3 Sugar tax deliberations in Asia

Reducing the intake of free sugar is a high priority in the prevention and control of NCDs (WHO, 2013b), with the intake of dietary sugar being one of the key factors in preventing obesity, a risk factor for many NCDs (Te Morenga et al., 2013). With ever more individuals in Asia falling into the pre-obese (BMI between 25.00 kg/m² and 29.99 kg/m²) and obese (BMI above 30 kg/m²) categories, imposing a tax on sugary beverages is a valuable tool to tackle obesity.

The Philippines has pioneered the use of taxes on sugary products. A sugar tax was introduced as part of its tax reform in 2017. Excise rates of PhP 6 and PhP 12 are imposed on caloric or non-caloric sweetened drinks and drinks containing high-fructose corn syrup, respectively (Department of Finance Philippines, 2017; WHO Regional Office for the Western Pacific, 2017b). The impact on sweetened drinks is a 14% increase in price. Other examples include Sri Lanka, where a 50 cent tax is being charged for each gram of sugar (Perera, 2018) since November 2017; Thailand will phase its levy on sugary beverages over six years (Kishimoto, 2017). Other countries continue to deliberate on the implementation of sugar tax while strengthening public health measures such as educating consumers in the Republic of Korea (Sun, 2017), or working with the soft drinks producers in Singapore to manufacture drinks with less sugar (Mohamad Salleh, 2018; Quah and Lee, 2017).

A whole-of-government approach demands effective systems of governance, directed towards healthy public policies and achievement of UHC. The SDGs now offer a unifying theme around which the different actors can come together. These actors are in both the public and private sectors. However, there is a need to take full account of the power differential between the often weak public sector and the diverse private sector, distinguishing weak local providers from strong transnational corporations.

PPPs can, if designed and implemented appropriately, facilitate more effective service delivery. Generally, they should be regarded as partial solutions and should, as with all policies, be subject to rigorous evaluation. For example, UDAY, a multicomponent diabetes prevention programme launched in India under the Lilly NCDs partnership, is a 5-year initiative

that includes training health workers to conduct screening and link patients with health-care systems for further treatment (IFPMA World Health Partnerships Directory, n.d.; Lilly, 2015). However, only 6% of those at high risk underwent post-screening confirmatory tests, suggesting the need for more communication interventions (Venkateshmurthy et al., 2018). Another example is the Communities for Healthy Hearts project, a collaboration between PATH, Novartis Foundation and the Ho Chi Minh City Provincial Health Department and Preventive Medicine Center. The project focuses on using community-level interventions, such as installing free blood pressure checkpoints and providing screening services by volunteers, to improve blood pressure levels among adults. About 54% of those screened with elevated blood pressure, as compared to the national rate of 13%, are on treatment (PATH, 2018). However, while welcome, these measures do not address the fundamental long-term problem of availability and affordability of medicines for the entire population, which is still a major challenge in many parts of Asia (Khatib et al., 2016).

Strong regulation is needed to ensure that the private sector does not undermine the values of public health care. Producers of harmful substances should never be involved in policy formulation and in decisions regarding regulation, including technical standards. In the case of the tobacco industry, this is widely accepted, and governments that have ratified the FCTC have committed to exclude them, although the industry is now seeking to circumvent this restriction using their next-generation tobacco products. An example is the new Philip Morris “Foundation for a Smoke-Free World”, which WHO and many other health organizations refuse to work with (Daube et al., 2017). However, the same is true of the alcohol and junk food industries, which employ similar tactics and even work with the tobacco industry in certain circumstances (McCambridge et al., 2018). Evaluations of such PPPs show that they focus on ineffective measures and avoid those that harm the producers (Knai et al., 2017). Importantly, policy-makers need to be cautious of the potential conflict of interest in such PPPs and adopt measures such as best practice guides when engaged in PPPs to mitigate conflicts of interest.

The emergence of the private for-profit sector in providing health-care services alongside the public sector has been considered to have expanded

the choices of consumers, although this is questionable where the supply of health workers is limited. However, even where it does make a contribution, regulation of the private sector tends to be fragmented. Regulation of the private sector should seek to ensure that service provision is fair and equitable, and aligned to the national strategy (Morgan and Ensor, 2016). As noted above, it is essential to differentiate the different components of the private sector. There is an enormous difference between the non-profit NGOs that can make a valuable contribution, albeit filling a gap that should ultimately be plugged by governments, in some countries, and large corporations that have enormous power, often exceeding that of individual governments. An example of the former, which has achieved considerable success, is Heartfile in Pakistan which, in collaboration with Lodhran, Pakistan, implemented a community-based CVD primary prevention project to train “lady health workers” as a means to reach populations which would otherwise be excluded (Nishtar et al., 2007).

3.3.3 Health workforce

Those responsible for the care of patients with NCDs should seek to do so in settings that are most convenient for those they care for, which in most cases will be as close as possible to their homes even if, at times, they will require more specialized services. This calls for an expanded cadre of health workers, deployed in a wide range of health facilities. Yet, in many LMICs, these health workers simply do not exist.

Given the limited supply of mainstream health professionals in many countries of Asia, such as doctors and nurses (Van Minh et al., 2014), a situation exacerbated by international migration (WHO, 2013a), there is a need for alternatives. Task-shifting involves delegating activities to those with lower levels of training (Joshi et al., 2014). When implemented appropriately, it can be effective, but it is important to recognize its limitations. Thus, mid-level health workers can, in some circumstances, achieve outcomes that are as good as those achieved by mainstream health professionals, but not in all circumstances. Consequently, they tend to be better at routine activities requiring little clinical judgement. Examples might include undertaking basic procedures or providing treatment within clear guidelines. They perform less well when faced with complex tasks that

require diagnostic skills or where there is uncertainty about the best way to manage the patient, for example, where patients have multimorbidity. While recognizing these limitations, community health workers (CHWs) with a relatively basic training do have the potential to provide some services in areas that are otherwise difficult to staff, thereby accelerating progress towards UHC (Tulenko et al., 2013). Additionally, the route to UHC needs to adopt a long-term view in planning for community health to ensure adequate support to both paid and unpaid CHWs. Box 3.4 gives examples of community-based interventions from Asia and measures to enhance the status of nursing in India and Singapore.

Box 3.4 Community-based interventions in Asia

Community-based approaches in Asia

CHWs offer a means to reach out to rural communities in countries with small numbers of conventional health workers, such as Bangladesh, India, Pakistan and Sri Lanka (Suhail and Azhar, 2016). The Control of Blood Pressure and Risk Attenuation (COBRA-BPS) pilot study examined home health education by CHWs in rural communities in South Asia, finding that they could achieve successful management of hypertension (Jafar et al., 2017). Similar results were obtained from another study conducted in Karachi, Pakistan (Majeed and Kamal, 2012). Other examples include CHWs contributing to the management of diabetes and hypertension in Iran (Farzadfar et al., 2012) and in India (Balagopal et al., 2012), while CHWs have been deployed in mental health services in India, Indonesia and Sri Lanka (Kakuma et al., 2011).

Nursing Now campaign: India and Singapore

The Nursing Now campaign, launched in February 2018, is a global initiative that seeks to enhance the status of nursing. It includes a suite of educational modules for new and existing nurses, using media and scholarship to attract and recruit individuals to the profession. Narayana Health in India has developed a training programme where nurses can use educational resources to update their skillsets. The flexibility of the programme also provides opportunities for nurses to learn beyond their area of care, boosting their confidence (Nursing Now, 2018). Singapore has also sought to expand its nursing workforce through the Care To Go Beyond campaign to attract, recruit and retain personnel. Interventions include the use of social media to attract younger persons to the profession, scholarships and career fairs at the community level to increase awareness of the profession (Nursing Now, 2018).

3.3.4 Service delivery

Health service delivery comprises the provision of quality care across the continuum of health promotion, disease prevention, diagnosis and onwards through treatment to palliative care (de Savigny and Adam, 2009). Across health systems in Asia, there are many innovative approaches to health service delivery.

Health promotion and disease prevention

Promotion of health and prevention of disease are fundamental to tackling the growing burden of NCDs and to stem the rising number of premature and preventable deaths due to NCDs. While many schemes to promote health are developed and implemented outside the health system, health authorities do have a role to play in identifying needs, developing interventions, evaluating them and monitoring their progress.

It has been estimated that by eliminating tobacco use and minimizing the risks associated with alcohol use, salt intake, obesity, raised blood pressure and impaired glucose tolerance, it would be possible to delay or prevent 37 million deaths each year (Kontis et al., 2014). Yet, modelling studies suggest that, unless current trends change markedly, much of Asia will fail to achieve the WHO 25x25 target (a 25% reduction in premature mortality from NCDs by 2025) (Kontis et al., 2015). The distribution of risk factors within the population, impacting most adversely on the poor, means that socioeconomic inequalities are likely to widen in the absence of concerted and effective action (Allen et al., 2017). This underscores the need for investment in inclusive and innovative approaches to disease prevention that reach all segments of society.

Screening and early detection

Screening activities, if evidence-based, can be an important part of a comprehensive response to NCDs. However, it is important that they meet the recognized criteria for screening programmes (Wilson et al., 1968), which many do not. As a consequence, much of the activity achieves no significant health gain but simply wastes resources.

One of the few areas where screening has been shown to be effective is the early detection of certain cancers, and in particular, cancer of the cervix. However, to be successful, it must be carefully organized, including systems to ensure that those in most need are not excluded, that the quality of diagnostic testing is high, and that those found to be at risk are adequately followed up. These conditions are rarely met. Few screening programmes for cancer of the cervix in Asia have been evaluated comprehensively. The programme in Singapore is an exception. It has been found to be moderately effective, although there are concerns about the declining uptake and gaps in coverage (Jin et al., 2013). Elsewhere in Asia, screening for cancer of the cervix is undertaken using very basic approaches, such as visual inspection with acetic acid (VIA), as used in provinces in Indonesia.

Beyond cancer, there are a number of initiatives to undertake screening for risk factors of NCDs at workplaces, such as the Singapore Total Workplace Safety and Health Framework, which screens workers for diabetes, high blood pressure and high cholesterol (Yang, 2018). However, further research on its cost-effectiveness is needed.

Box 3.5 Spotlight on hypertension in South Asia

Hypertension is a major risk factor for CVD and a public health challenge in South Asia, as elsewhere, with suboptimal rates of diagnosis, control and management. Screening for blood pressure is minimally invasive, affordable and an important component of diagnosing hypertension and linkage to further care. The COBRA-BPS study was piloted in Bangladesh, Pakistan and Sri Lanka to assess the long-term feasibility of public health interventions to lower blood pressure (Jafar et al., 2017). The intervention leveraged on a multicomponent intervention, which included blood pressure screening by CHWs, home health education by CHWs, as well as training local providers and providing checklists to document care, all tailored to the respective country context. During the 3-month follow up of the feasibility trial, the mean systolic blood pressure declined significantly by 4.5 mmHg (95% confidence interval [CI] [2.3, 6.7]) ($P < 0.001$) in the overall pooled analysis of nine clusters in three countries. In addition, the programme had high fidelity.

High levels of adherence by patients and health providers were obtained with a reduction in BP, and scaling up this multicomponent strategy was strongly supported by stakeholders (Jafar et al. 2016).

The HOPE-4 cluster randomized trial, ongoing in Malaysia (and Colombia), is evaluating a package of interventions, including task-shifting, simplified guidelines and single-dose combination therapy to improve the management of hypertension (Schwalm et al., 2018). Its design was informed by a detailed assessment of the health system, which identified barriers to effective treatment (Risso-Gill et al., 2015).

Treatment and long-term management

As NCDs are typically chronic, continued access to health services is necessary to ensure long-term treatment, management and support. The challenges are accentuated by the increase in multimorbidity, as noted above. However, in many Asian health systems, as elsewhere, the historical model of delivery of health services has been based on acute care, for injuries, infectious diseases and other self-limiting (in some cases, rapidly fatal) conditions. Thus, the rising prevalence of NCDs in the region calls for innovation in service delivery to address the long-term needs of patients with NCDs (Sharma, 2013).

For example, the Phu-Cuong commune in Viet Nam embarked on one such programme for the management of hypertension (Nguyen et al., 2011); a feasibility study showed that people with known hypertension and others detected opportunistically could be managed effectively by non-physician health workers supervised by physicians and supported by training and simplified protocols.

As the number of patients with multimorbidities is projected to rise globally and in Asia, there is a need for health systems that meet the health service needs of patients with multiple chronic conditions (Atun, 2015; Vos et al., 2016). Preparing for the needs of an ageing population with more than one chronic condition is essential as multimorbidity leads to a disproportionately greater need for health services and out-of-pocket expenditure (Bloom et al., 2015). Presently in Asia, as countries are coping

with the double burden of infectious diseases and NCDs, there are many examples of innovative strategies to address comorbidities, drawing in particular on lessons from the management of HIV where coexisting conditions are common (Chuah et al., 2017; Haldane et al., 2018). Box 3.6 gives an example of the management of two coexisting conditions.

Box 3.6 Integration of management of TB and tobacco in India

An estimated 20% of TB cases globally can be attributed to tobacco use, which is higher than HIV (16%) and diabetes (15%) (Lonnroth et al., 2010; Lonnroth et al., 2014). This is of particular concern in countries such as Bangladesh, India and Indonesia, where both the burden due to TB and tobacco use are high (WHO Regional Office for South-East Asia, 2017a).

India is the first country in the WHO South-East Asia Region to put in place a formal coordination mechanism for TB and tobacco control (WHO Regional Office for South-East Asia, 2017a). Tobacco cessation was integrated in TB care in facilities run by NGOs in India to assess the feasibility and effectiveness of the programme for current tobacco users (Gupte et al., 2018). Improvements were observed in documentation of tobacco status with a reduction from 77% (2 months) to 36% at the end of their anti-TB treatment (χ^2 for trend 42.93, $P < 0.001$). Further, effectiveness was noted in the seven-day point prevalence abstinence from 15% (2 months) to 32% (6 months) in new TB patients, and from 11% (3 months) to 15% (8 months) in retreatment patients (Gupte et al., 2018). This mixed-method study, however, also highlighted the need for sustained support to train providers in maintaining the rigour in documentation.

Palliative and end-of-life care

A comprehensive approach to NCDs will include appropriate and accessible palliative and end-of-life health services (Knaul et al., 2018; Spruyt, 2018). Although there is an overall need for greater investment in palliative and end-of-life care in the region, there is wide disparity in its availability and quality in different countries of Asia. As reported in the 2015 Quality of Death Index, some high-income Asian nations such as Japan, the Republic of Korea and Singapore rank in the top 20 nations for quality of death; however, other Asian nations such as China, India, Myanmar and Sri Lanka rank in the bottom 20 (Economist Intelligence Unit,

2015). In some countries, public and private organizations are working to increase services for end-of-life care. Box 3.7 gives two examples of the establishment of palliative care in the region.

Box 3.7 Spotlight on palliative care in Mongolia and Bangladesh

Palliative care in Mongolia has expanded greatly since the establishment of the Mongolian Palliative Care Society in 2000, championed by Dr Odontuya Davaasuren (Anand, 2017). Earlier, Mongolia had no government policy on palliative care, no hospices and no palliative care programmes. There was little use of morphine or other medicines for pain management at the end of life. Now, after lobbying for policy change, palliative care is included in the legislation, and medical students and social workers receive training in palliative care. Ulaanbaatar currently has 10 palliative care services, and provincial hospitals in all 21 provinces have the capacity for palliative care, including 36 palliative care units, i.e. a total of 190 beds to serve 3 million people (Davaasuren and Ferris, 2018). Further, legislation has been amended to enable pharmacies to distribute morphine free to all patients with cancer, if needed.

In Bangladesh, the Center for Palliative Care, Bangabandhu Sheikh Mujib Medical University is working in collaboration with the World Hospice and Palliative Care Alliance. It has developed a project designed to provide palliative care services to older people in two large slum districts in Dhaka. It reported high satisfaction among the beneficiaries of the programme; but questions remain about sustainability without ongoing funding (Zaman et al., 2017). To meet the increasing demand for palliative care services, health systems must innovate and invest in many more initiatives to provide appropriate and timely palliative care.

3.3.5 Medicines, health products and information systems

Medicines and health products

Given the chronic nature of NCDs and the often lengthy, or indefinite, treatment courses, medicines and other health products are an essential component of responses of national systems and an integral part of achieving UHC (Beran et al., 2014). Quality-assured essential medicines should be readily available in adequate quantities, and at a price that both

individuals and the community can afford (WHO, 2003). However, in South-East Asia, fewer medicines for NCDs are available than those for communicable diseases (WHO Regional Office for South-East Asia, 2017b). Further, access to medicines and monitoring of products vary widely across Asia and, within countries, between urban and rural communities, as well as between socioeconomic groups (Hogerzeil et al., 2013; Khatib et al., 2016).

However, on their own, medicines are not sufficient to provide effective, high-quality care. It is essential that prescribing should be appropriate, supported by evidence-based clinical guidelines and policies to disincentivize inappropriate prescribing, including corruption. It is also important to have the appropriate ancillary equipment, such as sphygmomanometers and glucometers. These are available at most primary care facilities across Asia but the cost of test strips for glucometers is often prohibitive as manufacturers have adopted a business model whereby the glucometers are sold cheaply but they make large and continuing profits from the sale of strips. More advanced diagnostic capacity, for example, for cancer, is markedly less developed, particularly in LMICs (WHO Regional Office for South-East Asia, 2017b).

Ensuring a reliable supply of quality medicines for all is extremely complex, demanding a high degree of organization of many different actors. These include agencies and organizations to approve the medicines, based on evidence of cost-effectiveness, regulators to ensure quality, a problem specific to some parts of Asia because of the extensive trade in counterfeit medicines (Attaran et al., 2012), and systems of procurement and distribution (WHO Regional Office for South-East Asia, 2017b). For example, Bhutan has launched the electronic-Bhutan Medical Supplies Inventory System (e-BMSIS) designed to ensure timely, reliable information on medication supplies (Tshering, 2017). Box 3.8 gives selected interventions that aim to improve prescribing habits for medication for hypertension and diabetes.

Box 3.8 Interventions that aim to improve prescribing habits for medication for hypertension and diabetes

Changing habits for prescribing medication for hypertension in China

In China, a randomized controlled trial enlisted providers at the primary care level, in township hospitals, to offer (i) prescription of a standardized package of medicines targeted at those with hypertension or diabetes; (ii) advice about specific lifestyle interventions; and (iii) advice about adherence to medication (Wei et al., 2017). The study enrolled 28 130 patients in 33 intervention and 34 control township hospitals; after 12 months, participants in the intervention arm had substantially improved prescribing rates of antihypertensives, statins and aspirin ($P<0.001$), and had higher rates of taking aspirin and statins ($P<0.001$). Importantly, it was observed that many doctors changed their prescribing behaviour – at baseline, prescription of two antihypertensive drugs was low, approximately 23% in both the control and intervention arms; at 12 months' follow up, around 50% of patients were prescribed two antihypertensives in the intervention arm compared with 20% in the control arm (odds ratio [OR]=3.55, 95% CI: 3.31 to 3.80, $P<0.001$). This study underlines the importance of the patient–provider dynamic in the uptake of medications for NCDs and the need for interventions that are sustainable, acceptable and scalable.

An educational intervention for uncontrolled diabetes in Thailand

Adequate control of diabetes is crucial for appropriate management and prevention of complications and comorbidities. An intervention in a general hospital in Thailand provided in-person nurse-led counselling and education for patients with uncontrolled diabetes, followed by individual follow-up counselling by the same nurse over the phone (Supachaipanichpong et al., 2018). The intervention group had greater reductions in HbA1c, as well as significantly better knowledge of medication use, medication beliefs and medication adherence than the comparison group. The study showed the feasibility of nurse-led interventions to support patient adherence to medication for diabetes.

Patient-related factors underpinning the uptake of and adherence to medications for NCDs are diverse, multifaceted and influenced by an array of factors including socioeconomic aspects such as the ability to pay and ability to seek care; personal factors such as awareness, knowledge and

health beliefs; as well as behavioural traits such as perception of need and motivation (Levesque et al., 2013; Schwarzer, 2008). Interventions across Asia have sought to support adherence in patients, including through the use of telemedicine, changes in the labelling of medications, behavioural interventions and patient education.

Information system

Asia has experienced an exponential growth in access to information technology (IT), including personal mobile devices, Internet access and connectivity. Indeed, Asia has some of the highest rates of mobile phone penetration globally with 776.3 million mobile connects, corresponding to a regional penetration rate of 124% in South-East Asia alone (Deloitte, 2017; We Are Social, 2015).

This proliferation of technology offers considerable potential, at least in theory, for health equity and service delivery, providing unprecedented access and outreach to regions, communities and vulnerable groups. In rural regions of Asia, technology has been leveraged to support health-care human resources, offering providers greater diagnostic capacity. For example, in rural India and Thailand, telemedicine is being used for digital retinal photography to provide more timely, low-cost and accessible diagnosis of diabetic retinopathy (Das and Pappuru, 2016; Lim et al., 2014). In cities, m-Health/e-Health is being introduced to assist in rehabilitation and secondary prevention of NCDs, particularly for CVD. In Singapore, telehealth is being used in secondary prevention among patients with heart failure – each patient is given a personal health tablet, a weighing machine and a blood pressure monitor; patients measure their weight, blood pressure and pulse, and readings are uploaded automatically to a central system via a 3G network, which is monitored by nurses (Lee, 2014). There is also much potential in the use of digital technologies for the care of mental illness and promotion of mental health in Asia, as m-Health may offer a more private avenue to access care and overcome some of the stigma attached to seeking care (Brian and Ben-Zeev, 2014), although this will depend greatly on context; for example, in some societies where women have limited access to a shared mobile phone in the family. There is also a need for caution overall, with evidence of a substantial gap between the claims made for these interventions and the ability to demonstrate

effectiveness (Black et al., 2011). Hence, it is essential that innovations be subject to rigorous evaluation before scaling up.

Box 3.9 Interventions to treat tobacco dependency

mTobacco cessation programme to reduce prevalence of smoking in India

Establishing programmes that leverage the potential to achieve wide outreach offered by mobile phones offers an avenue to target a wide audience. The mTobacco Cessation programme in India, jointly launched by the Ministry of Health and Family Welfare, WHO and the International Telecommunications Union, achieved a record of over 2 million tobacco users within a year (WHO, 2016c). By releasing daily and weekly text messages (in English and Hindi) with advice to quit smoking, the nationwide programme offers a means to achieve greater outreach than the conventional tobacco cessation clinics (Dain, 2017). The programme also monitors and evaluates its activities by generating real-time data on enrollees, their pattern of usage and the quit status. The programme shows the possibility of a scaled-up nationwide m-Health programme to disseminate information, although the most effective steps to reduce tobacco use remain population-based measures that tackle price, availability and marketing.

Beyond personal technology use, health systems can benefit from technological advancements, including the use of electronic medical records (EMRs) both in hospitals and primary care to support the management of patients with NCDs. However, the establishment, upkeep and technical support of such systems require substantial investment and commitment from policy-makers, institutions and providers to be scalable and sustainable. Such activities have been largely small-scale endeavours. One notable exception is Singapore, where strong government support has facilitated the National Electronic Health Record (NEHR) initiative, which aims to digitize and electronically store every aspect of a person's medical history, including visits to doctors in the private sector, chronic medication, allergies and vaccination records (Lai, 2017). To incentivize the uptake at all levels of care, it is proposed that early adopters who start contributing data by June 2019 will be able to claim a one-off amount to offset the costs of upgrading systems. Such support and motivation for buy-in from diverse stakeholders is necessary to remove barriers to uptake such as the cost of implementation and ability of the provider to use such systems.

3.4 Optimizing national and regional responses for noncommunicable disease control in Asia

To better understand the ways in which health systems respond to NCDs, it is necessary to assess the performance of health systems. While recognizing the importance of the three main goals of a health system – improving health, providing responsive services and financial protection – each of which has been described in detail elsewhere, we focus here on three elements that are particularly relevant to NCDs, i.e. quality of health care, people-centredness and resilience.

3.4.1 Quality of health care

A key objective of a health system is the equitable and consistent provision of high-quality care. However, in reality, quality varies greatly. There is an extensive literature on measuring and improving the quality of care (Legido-Quigley et al., 2008) and countries in South-East Asia, such as Bhutan, Cambodia, Singapore and the Republic of Korea, are among the countries that have made most rapid progress between 2000 and 2016 in improving health outcomes as measured by the Healthcare Access and Quality Index, which evaluates progress in reducing deaths from conditions amenable to health care, after adjusting for underlying risk factors (Fullman et al., 2018).

A comprehensive strategy to improve quality should, ideally, be based on an effective legislative framework, setting out duties and responsibilities of key actors, including professional regulators, professional bodies, and health technology and other quality assessment agencies. In many countries, including India, Myanmar, Nepal, Singapore and Thailand, the relevant legislation on professional regulation includes duties and responsibilities to provide high-quality care (Elison et al., 2015; Lim, 2004).

It is also necessary to have sources of evidence on which to make decisions about investment in pharmaceuticals and technology, drawing on the now extensive experience with health technology assessment. A number of countries in Asia now have health technology agencies (HTAs) (Chootipongchaivat et al., 2015). Examples include the National HTA organization (Komite Penilaian Teknologi Kesehatan [Komite PTK]) in

Indonesia, Health Intervention and Technology Assessment Program in Thailand, Agency for Care Effectiveness in Singapore, and National Evidence-based healthcare Collaborating Agency in the Republic of Korea.

In some circumstances, where there are independent providers of care contracting with public authorities, accreditation of either facilities or health-care professionals may play a role in supporting quality. This process is different from the regulation of professionals. An example is the Healthcare Accreditation Institute in Thailand. A few facilities have sought international accreditation, typically with the Joint Commission International, which accredited National Healthcare Group Polyclinics in Singapore for its primary care programme in 2012, and Kluaynamthai 2 Hospital in Thailand for its long-term care programme in 2014 (Joint Commission International, 2018).

3.4.2 People-centredness

Health systems globally are striving to provide care with the following attributes: safety, timeliness, effectiveness, efficiency, equity and people-centredness (AHRQ, 2016). The push for people-centred health systems takes a wide view of health, recognizing that before becoming patients, people must be informed and empowered to both promote and protect their own health (Odone et al., 2018b). This approach is particularly important for NCDs, which are often preventable by mitigation of risk factors whose origins lie beyond the health system, demanding a holistic approach to health promotion and disease prevention. Further, people-centredness rests on the belief that contact with the health system must be accessible, affordable and acceptable to patients' needs; as increasing numbers of people across Asia are diagnosed with and must manage NCDs over long time periods, it is imperative that they are able to access appropriate care. This is particularly important for those belonging to vulnerable and marginalized groups who presently face numerous barriers to access and care, and are facing an increasing burden of NCDs. To realize such a system, empowerment, reform and innovation is needed at multiple levels, including individuals and the community, health-care practitioners, health-care institutions and health systems (WHO Regional Office for the Western Pacific, 2007). People-centredness is also an important component of the push towards UHC, and placing people at the centre of

health system design, configuration and implementation is crucial to the realization of quality and UHC.

While there are some examples in Asia of national-level or systems wide moves to enhance people-centredness, for example, in Thailand (Box 3.10), there are numerous examples across Asia of small-scale initiatives to provide people-centred and equitable health care. While people-centredness is driven by broader policy changes, it also hinges on interventions and contextual knowledge of the community. This includes prevention and educational campaigns, which must be people-centred to ensure that health promotion messages and programmes are contextually appropriate and audience-specific to ensure better health outcomes; for example, in the Philippines, changes in tobacco policies combined with a contextually appropriate Youth Smoking Cessation Programme and other public awareness campaigns have been linked to a one third drop in the number of tobacco users among adolescents during 2000–2003 (Miguel-Baquilod et al., 2005). An important component of people-centred care is to provide treatment and support that enable people to better self-manage their conditions in the community; for example, in Shanghai (China), a programme run by community volunteers for chronic disease self-management was shown to significantly improve health behaviours and health status (Fu et al., 2003). This is bolstered by primary care strengthening, another important component of UHC, which enables timely access to health services and continuity of care (Rao and Pilot, 2014). Another important aspect of people-centredness is the availability of integrated services, particularly for marginalized or vulnerable populations. For example, in Viet Nam, preference for integrated services by persons living with HIV and requiring substance use treatment was noted (Diep et al., 2016). This is consistent with other studies in the country where some patients receiving methadone treatment at a substance use clinic reported preferring integrated methadone and HIV treatment at one facility (Tran et al., 2015).

As health systems move towards people-centred care, an often neglected, but important group is the migrant population. Asia is the host to the largest share of the world's refugee population (Amara and Aljunid, 2014). Chronic illnesses such as pain disorders are prevalent among urban

refugees and these populations are often at a greater risk of NCDs such as CVDs (Amara and Aljunid, 2014; Odone et al., 2018a). Of importance, and aligned with people-centredness, is the need to ensure access by refugees and migrants to health-care services in resettled countries. Examples include initiatives such as insurance schemes for refugees in Malaysia (International Federation of Red Cross and Red Crescent Societies 2014) as well as successful community-based interventions across Asia that provide people-centred health care to this vulnerable population (Box 3.11). Ensuring that the type of health services offered, as well as their location, are accessible, affordable and acceptable is imperative to achieving people-centred care even for vulnerable and marginalized groups. Importantly, people-centredness in the whole-of-society health system needs to adopt interventions that include all populations, including migrant populations.

Box 3.10 UHC in Thailand

Thailand has been widely recognized as a world leader in UHC at low cost (Balabanova et al., 2013; Kim, 2014), with over 98% of the population having health coverage (Tangcharoensathien et al. 2015). The health centre is the first point of contact with the health system and provides a range of primary health-care services (Tangcharoensathien et al., 2018). Importantly, there is a large rural population and socioeconomic disparities in the country; as such, Thailand has focused primary care efforts on rural areas – increasing the supply of generalist physicians to rural areas, offering rural health insurance and expanding rural clinics. As a result of these initiatives, mortality among the poorest children fell relative to their wealthier counterparts and the poor–rich gap in mortality decreased by more than half between 1990 and 2000 (Vapattanawong et al., 2007). This push for rural coverage builds on policies that support a strong and committed health workforce with a focus on recruitment, training, distribution and retention in rural areas (Pagaiya and Noree, 2009). These efforts and the adoption of UHC in Thailand has provided many benefits, including reduced prevalence of households facing catastrophic health expenditure and medical impoverishment (Limwattananon et al., 2007); low rates of unmet health needs, 1.5% for outpatient care and 0.1% for inpatient care in 2015 (Wanwong et al., 2017); and high patient and provider satisfaction (NHSO, 2017).

Box 3.11 Migrant populations in Asia

Through policies and initiatives that are migrant-sensitive, Asia's health systems can further strengthen the integration of migrant populations with people-centred care. In Malaysia, the UN High Commissioner for Refugees partnered with RHB Bank and launched the Refugee Medical Insurance scheme to improve refugees' access to health services (International Federation of Red Cross and Red Crescent Societies, 2014). Thailand introduced the migrant health insurance scheme, similar to the universal care package for its citizens, and services such as trained community health volunteers (Tangcharoensathien et al., 2017). In Sri Lanka, a suite of targeted initiatives involving different actors beyond governmental organizations has been developed to prevent and treat NCDs in the migrant population, including returnees. For example, Sri Lankan refugees and failed asylum-seekers from India are eligible to receive free health checks before integrating into its public health system (Kontunen et al., 2014).

There is also greater outreach to the migrant population through the use of community-based initiatives such as behavioural interventions, and capacity-building of government and volunteer CHWs. In Jordan, a community-based health and first-aid training programme empowered the refugees with simple health-care knowledge and tools to bring about change in health-seeking behaviour (Jordan Red Crescent Society, 2016). A community health programme in Lebanon trained refugee outreach volunteers to provide the first point of primary care assessment, such as health promotion, and making referrals to primary care facilities; thereby promoting linkages to the public health system (Sethi et al., 2017). In Malaysia, volunteer CHWs are trained to conduct screenings for mental health and community outreach visits in their communities (Health Equity Initiatives, 2018). The Trans-Cultural Psycho-Social Organization, a PPP in Nepal, offers a network of mental health services, including organizing capacity-building activities for the government and CHWs (WHO Regional Office for South-East Asia, 2018).

3.4.3 Resilience in health systems

Resilience is an increasingly important concept to consider when understanding health systems (Kruk et al., 2015). The study and conceptualization of resilience has its roots in the environmental sciences,

ecology and engineering where it is used to understand how systems respond to shocks in a variety of ways (Holling, 1986). Presently, there is no single definition of resilience in health systems, and it is largely used to discuss strengthening of health systems – efforts to improve the system to operate more effectively, efficiently and equitably (De Savigny and Adam, 2009). However, the recent discourse on resilience has come to posit it as the health system's ability and capacity to adapt its functioning to absorb a shock and transform, if necessary, to recover from disasters (Blanchet, 2015; Hanefeld et al., 2018). This framing of resilience is pertinent to contexts across Asia, as various regions have experienced both natural and human-induced disasters, as well as conflict; thus requiring health systems that can respond to and withstand these shocks.

Resilient health systems are crucial to those living with NCDs in Asia, as such people are more vulnerable to the health impact of emergencies (WHO, 2016d). Indeed, emergencies may increase the risk of NCD complications – heart attacks and strokes may be two to three times more common during emergencies than in normal pre-emergency conditions – as well as pose an increased burden from psychological stress (Hayman et al., 2015; Mollica et al., 2004). Complex emergencies may limit access to treatment, potentially over a long period, which can lead to poor outcomes in affected patients and translate to higher costs and burden on already fragmented systems (Slama et al., 2016). For example, a failure to recognize the scale of mental health problems and the barriers that those affected face in accessing health care during complex emergencies means that they often remain undiagnosed and untreated (Jones et al., 2009). To address these challenges, it has been recommended that health systems and humanitarian agencies should better prepare for the needs of the large population living with NCDs and incorporate NCDs into existing emergency-related policies, standards and resources; as well as develop technical guidelines on the clinical management of NCDs in emergencies; and ensure greater coordination of health service provision during and following emergencies (Demaio et al., 2013). This type of preparedness and planning is imperative to the building of resilient health systems that can withstand shocks and recalibrate to provide continuity of care post-emergency.

3.5 Conclusions

With an increasing burden of NCDs, Asian countries will require whole-of-society approaches underpinned by strong mechanisms of governance to ensure equitable and quality care for these conditions. To ensure appropriate, affordable and sustainable interventions, health systems will need to focus on the continuum of care beyond the hospital and strive to adopt community-based approaches. In particular, they need to develop policies that *include* everyone, regardless of their geographical location, citizenship status, age or other characteristics. They must also *invest* in ways that ensure sustainability of resources, a supply of trained workers and appropriately designed facilities. And finally, they must *innovate*, pushing forward the frontier of what is possible with new technology, while recognizing the importance of ensuring that it is truly evidence-based.

Moving forward, more engagement between the State and society is needed to catalyse change and partnerships for shared governance, with commitments to co-producing health for those at risk of or suffering from NCDs, and to ensure the success of health in all policies. As an enabler for a whole-of-society approach, effective mechanisms for governance of health systems, which take account of the specific characteristics of NCDs, contribute to the attainment of the SDGs and, in particular, UHC.

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Chapter 4. Health systems barriers to controlling infectious diseases in low and middle income Asian countries

Mishal Khan, Sonia Rego, Shishi Wu, Nima Asgari-Jirhandeh, Richard Coker, David Heymann, Helena Legido-Quigley



4.1 Introduction: Regional context

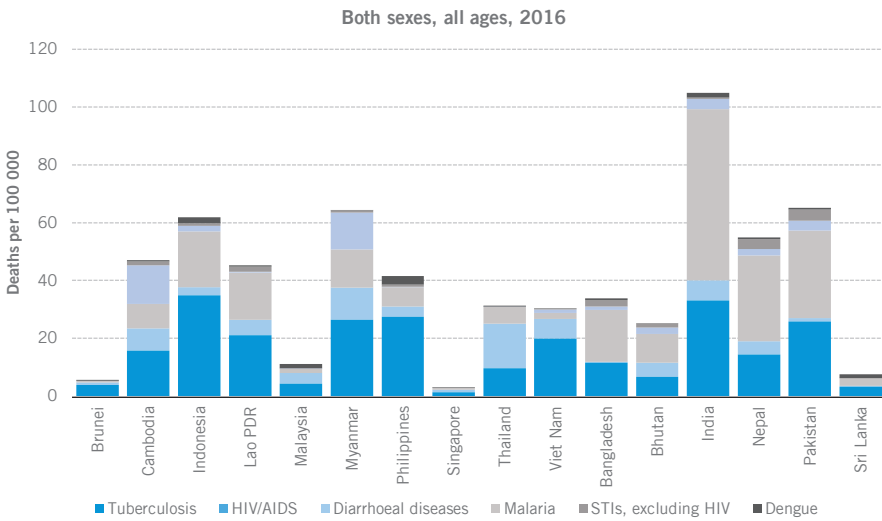
Communicable or infectious diseases are transmissible from one person or animal to another through a range of direct or indirect contact (WHO, 2018a). Owing to the propensity of specific communicable diseases – such as Ebola and influenza – to rapidly spread across countries and continents, mitigating risks from infectious diseases is currently high on the global health agenda. Although media attention is usually dominated by communicable diseases that have the potential to spread to HICs, the majority of the communicable disease burden is shouldered by LMICs. Communicable diseases not only cause substantial mortality in LMICs, but they also result in massive economic impacts on families and societies, and are often associated with social exclusion and stigma (WHO, 2012), and may threaten security. It is an uncomfortable reality that a large proportion of infectious diseases in LMICs are entirely preventable or treatable. However, weaknesses in health systems in the countries that are most affected by infectious diseases has meant that essential preventive and curative measures are often inadequate.

Against this backdrop, this chapter summarizes how weaknesses in key components of the health system, conceptualized in line with the WHO health systems building blocks framework (WHO, 2018b), impede progress on addressing infectious diseases in Asian LMICs. For the purpose of this chapter, we refer to South-East Asia as the ten member countries of ASEAN, i.e. Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam (Coker et al., 2011; Funston, 2001). We will also discuss examples from South Asian countries with prominent communicable disease challenges, including Pakistan, India and Sri Lanka. We acknowledge that there is huge economic, geographical, cultural and political diversity across these countries, and focus on highlighting some common health systems challenges.

Overall, in 2015, the burden from infectious diseases in terms of DALYs was 25 million in the ten South-East Asian countries, and 81 million in India, Pakistan and Sri Lanka (WHO, 2016). The infectious disease burden from South-East Asia and India, Pakistan and Sri Lanka amounted to

7.1% and 22.6% of global DALYs in 2015, respectively. In terms of deaths, in 2016, almost 500 000 people lost their lives due to infectious diseases in South-East Asia and a staggering 1.4 million in India, Pakistan and Sri Lanka (WHO, 2018c) (Fig. 4.1). Major causes of death in the region included TB, sexually transmitted infections (STIs) including HIV, and diarrhoeal diseases.

Fig. 4.1 Deaths from leading infectious diseases in South and South-East Asia



Source: Institute for Health Metrics and Evaluation, 2018b

As these figures illustrate, infectious diseases contribute substantially to avoidable deaths and additionally to loss of healthy life years in Asian LMICs. In this chapter, the impact of specific health systems challenges on progress towards infectious disease control is illustrated using HIV, TB, malaria, AMR and avian influenza as examples. We therefore summarize the transmission routes of these infectious disease threats and their epidemiology in the region (Box 4.1).

Box 4.1 Overview of infectious diseases used in this chapter to illustrate the impact of health systems weaknesses on achieving effective control

HIV is a virus that is spread through blood, semen, rectal fluid, vaginal fluid and breast milk, and, left untreated, leads to AIDS. There are approximately 37 million people globally living with HIV, and the South-East Asia region bears the largest HIV burden after sub-Saharan Africa (UNAIDS, 2017).

While the overall prevalence is low, there are an estimated 3–4 million people in South-East Asia living with HIV, and a further 2.1 million in populous South Asian countries such as Pakistan and India (UNAIDS, 2016a & 2016b). Currently, there is no cure for HIV, but antiretroviral therapy (ART), if taken regularly for the patient's lifetime, can help those with HIV live longer, healthier lives. As heterosexual transmission is predominant in South-East Asia, safer sexual behaviour is an important preventive strategy. Other prevention strategies include testing and counselling for HIV and STIs, medical male circumcision, antiretroviral (ARV) drug use for prevention, harm reduction for injecting drug users, and elimination of mother-to-child transmission.

Tuberculosis (TB) is a bacterial infection spread through coughing and sneezing. It is now the leading cause of death from any infectious disease, surpassing HIV. In 2016, there were an estimated 10 million cases of TB across the globe, of which 64% occurred in seven countries, most of which are in Asia: India, Indonesia, China, Nigeria, Philippines, Pakistan and South Africa (WHO, 2017a). Additionally, the WHO 2017 *Global tuberculosis report* lists Myanmar, Indonesia, Thailand, Philippines and Viet Nam among the 27 countries bearing the highest burden of multidrug-resistant (MDR)-TB in the world (WHO, 2017a). TB is one of the main causes of death associated with AMR. The cornerstones of TB control are early initiation of treatment (to limit transmission) and ensuring adherence to treatment to reduce the chances of emergence of drug resistance (WHO, 2017a).

Malaria is caused by the *Plasmodium* parasite, which is transmitted by the *Anopheles* mosquito. There were 1.4 million confirmed cases of malaria in South-East Asia in 2016, and a reported 557 deaths (WHO, 2017b). Drug-resistant malaria is also prevalent across the region, including resistance of the malaria parasite *P. falciparum* to chloroquine, sulfadoxine–pyrimethamine, and most recently, and of considerable concern, artemisinin. It is well documented that western Cambodia, near the border with Thailand,

has been an epicentre of antimalarial resistance since the 1950s (Alam et al., 2011; Dondorp et al., 2010). Currently, the commonly used measures to prevent malaria include using insecticide-treated nets, and destruction of mosquito larvae and adult mosquitoes by indoor residual spraying (WHO, 2018d).

Overall, although gaps remain in our understanding of **AMR** in South-East Asia, available evidence indicates that it is an important and growing challenge. For example, studies have identified a high prevalence of antimicrobial-resistant infections in paediatric hospitalized populations in several South-East Asian countries and in Pakistan (Al-Taiar et al., 2013; Stoesser et al., 2013; Turner et al., 2016). The Asian Network for Surveillance of Resistant Pathogens (ANSORP) reported rates of pneumococcal resistance to penicillin exceeding 50% in some contexts and that resistance had spread across the region (Song et al., 1999). Resistance to enteric pathogens is becoming increasingly prominent, with studies in Thailand and Cambodia identifying high rates of resistance to ciprofloxacin in *Campylobacter coli* and *Campylobacter jejuni* among isolate samples from children hospitalized with acute diarrhoea (Bodhidatta et al., 2002; Meng et al., 2011). Critical pillars of AMR control include: reducing misuse of antibiotics in humans and animals; improving infection control to reduce the need for antibiotics; strengthening surveillance systems and increasing access to diagnostics (Dar et al., 2016).

Finally, **avian influenza** has received a lot of attention in South-East Asia owing to concerns that the next pandemic could arise in this region. Human transmission of avian influenza has been reported in Viet Nam, Indonesia, Thailand and Cambodia, among other countries, and the H5N1 subtype, which is transmissible to humans, is endemic in poultry the region. Although there has been active investment in health system preparedness for potential outbreaks in many countries by both domestic and international players, the translation of these strategic plans into action is still lacking in many countries in the region (Fidler, 2008). Preparedness in this context would involve strong systems for timely detection and reporting of outbreaks and ensuring that health systems have surge capacity (defined in the service delivery section).

4.2 Governance and leadership

Effective leadership and governance is the starting point for strengthening other components of the health system. Since an entire chapter of this book (Chapter 1) is devoted to leadership and governance, the discussion here will focus on a relatively recent development related to governance of infectious disease control, known as the revised International Health Regulations (IHR). The IHR, adopted by the World Health Assembly in May 2005, represent a major development in the use of international law to impact on public health and security. As a legal instrument that is binding in 196 countries, including all World Health Organization (WHO) Member States, the IHR aim to facilitate countries in preventing and responding to acute public health risks that have the potential to cross borders and threaten people worldwide, such as avian influenza and AMR.

Unlike other public health agreements that lack a legal basis, the IHR have the potential to substantially impact on national policies as they present an obligation for State Parties to detect, assess, report and respond to public health emergencies of international concern. To date, this is the only legally binding public health treaty in existence for infectious diseases. The only other legally binding public health treaty is the WHO Framework Convention on Tobacco Control (FCTC), a 2005 treaty promoting multilateral cooperation and national action to address the tobacco epidemic (Roemer, Taylor and Lariviere, 2005).

The IHR demonstrate challenges in implementing regulations and governance measures. Following IHR's 2007 ratification, all participating countries were required to develop minimum core public health capacities to implement the IHR by 2012, and WHO later granted countries a two-year extension to meet those capacities (Olu, 2016). However, the IHR is a "soft law" that lacks an enforcement mechanism. A mechanism for independent monitoring has been set up only recently, which relies on countries to self-report their progress on core capacity development (Burkle, 2015; Fidler and Gostin, 2006). In 2015, the 68th World Health Assembly featured a recommendation from the IHR Review Committee on Second Extensions for Establishing National Public Health Capacities and on IHR Implementation. The recommendation suggests that countries transition

from exclusive self-reporting on their progress toward IHR capacity to an approach that combines self-evaluation, peer review and voluntary external evaluations (Lo, 2017).

Thus, in February 2016, WHO, in collaboration with the Global Health Security Agenda (GHSA), introduced a joint external evaluation (JEE) tool to evaluate IHR capacities every five years, as a collaborative process by which WHO and partner organizations can assess and monitor country capacity to implement the IHR (WHO, 2005). JEEs are voluntary and based on national and international subject experts reviewing self-reported data, followed by a country visit. It is envisaged that JEEs would improve governance, strategic planning and overall preparedness to combat infectious diseases, with a focus on those with pandemic potential, although concerns have been raised about distortion of national priorities and (mis) use of JEE scores to make country comparisons (Wilson, Brownstein and Fidler, 2010).

4.2.1 Human resources

There is clear evidence to demonstrate the critical role of human resources in improving population health, with recent studies showing that health outcomes are strongly correlated with the quality and density of health-care providers (HCPs) (Chen et al., 2004; Drager, Gedik and Dal Poz, 2006). WHO suggests that, globally, no fewer than 2.4 million doctors, nurses and midwives are needed in order to meet health goals (WHO, 2006). Across Asia, there is a range of physician-to-population ratios, defined as physicians per 1000 people, as illustrated in Table 4.1. For example, Cambodia has 0.14 physicians per 1000 people, Thailand has 0.47 and Myanmar has 0.57 (WHO, 2018e). In contrast, the United Kingdom has 2.8 physicians per 1000 people (Moberly, 2017). To put those numbers on a more approachable scale, in Cambodia, which has one of the lowest physician densities in the region, there is approximately one physician for every 10 000 people.

It is also important to note that this is not an even dispersal of health professionals – there is an additional disparity between rural and urban areas (So and Witter, 2016). Thus, in addition to a shortage in the overall number of HCPs in LMICs, lack of training to improve the skills of staff

at different service levels, inadequate geographical distribution within countries, dissatisfaction with remuneration, and low motivation along with poor staff retention contribute to the inconsistent and inadequate quality of services provided by HCPs (Figueroa-Munoz et al., 2005).

Table 4.1 Physicians per 1000 population in selected Asian countries

Country (year)	Physician density/1000 population
Bangladesh (2015)	0.47
Cambodia (2014)	0.14
India (2016)	0.76
Lao People's Democratic Republic (2014)	0.49
Myanmar (2012)	0.57
Pakistan (2015)	0.98
Philippines (2004)	1.11
Singapore (2016)	2.28
Thailand (2015)	0.47
Timor-Leste (2011)	0.08
Viet Nam (2016)	0.82

Source: WHO, 2018e

Weaknesses in the number, quality, motivation and distribution of HCPs, unsurprisingly, have a harsh impact on infectious disease outcomes. LMICs face a myriad of challenges in improving human resources for health, as in the case of Cambodia. Cambodia experienced civil war and genocide in the 1970s, which killed between 1.5 and 3 million people, approximately one quarter of the population including, disproportionately, skilled human resources, as well as much of the health infrastructure (Cambodia MoH, 2012). By the end of the war in 1979, there was a dire shortage of all health workers, and initial rebuilding efforts were designed under a socialist model. While the nation has experienced increasingly positive health outcomes in the past few decades, there continues to be a shortage of qualified health-care staff owing to the resultant vacuum of qualified HCPs to train future generations created by the genocide and low investment in public health systems (Grundy et al., 2009). Recent literature on the subject also indicates that the existing system in Cambodia continues to struggle with limited power and capacity within enforcement bodies to regulate the activities of health professionals (Clarke et al., 2016).

Human resource shortages do not have a single cause and can be driven by: public health systems that do not, or are unable to, train enough HCPs; uneven distribution of health workers; and migration to urban areas, to other nations and to the private sector (WHO, 2007).

TB, a disease for which there has been a distinct lack of decline in prevalence over the past decade, illustrates how human resource constraints impede infectious disease control and can result in the emergence of drug resistance. TB demands a long duration of treatment – at least six months for drug-sensitive strains, and nearly two years for MDR-TB (Winston and Mitruka, 2012). Regular contact with HCPs throughout treatment is essential to ensure adherence to treatment and adjustment of medicine dosage. Although there were initial calls for daily directly observed treatment (DOT) by a health-care worker, a randomized trial in Pakistan demonstrated that family or community members can be guided on how to provide treatment support (Walley et al., 2001). However, the doctor or nurse who initially diagnoses a TB patient has to find the time to identify a treatment supporter for every patient and to advise both the patient and the treatment supporter on adherence to treatment. As a recent study in Myanmar indicates, when HCPs are overburdened, a substantial proportion of TB patients are not assigned any treatment provider (Khan, Hutchison and Coker, 2017; Khan et al., 2017), and this may result in poor adherence to treatment and the emergence of drug resistance.

In light of the major barrier to improvements in health systems performance posed by human resource constraints, there are efforts in areas with low physician density to train other health-care workers to perform tasks traditionally done by physicians (known as “task-shifting” or “task reallocation”). Although task-shifting can be a cost-effective solution in some settings, barriers can include opposition by doctors owing to concerns about job security and differences in the quality of care for populations treated by paramedics (Niezen and Mathijssen, 2014).

Pakistan’s Lady Health Workers Programme is a well-established example of an initiative to enhance the number and distribution of HCPs (Hafeez et al., 2011) (Box 4.2). As detailed in the country chapter, Sri Lanka has developed institutional capacity to produce the majority of human resources for health required in-country through nine medical faculties

(responsible for training medical, dental and selected paramedical categories) and additional MoH facilities (responsible for training pharmacists, laboratory technicians, midwives, public health inspectors, etc.). However, the migration of trained HCPs to other countries continues to be a challenge for health systems strengthening in Sri Lanka and other countries in Asia such as India and the Philippines (Connell, 2010).

Box 4.2 Case study of Pakistan's Lady Health Workers Programme

The Lady Health Workers Programme has been working in Pakistan since 1994 to encourage community participation in changing attitudes around health and family planning, and administering immunization campaigns. Women from local communities go through six months of training to deliver appropriate care in the home, and each health worker is responsible for around 1000 people. Lady health workers (LHWs) have had a positive impact on delivering family planning services and immunizations, and the Programme has been extensively externally evaluated (Oxford Policy Management Limited, 2018).

The Programme is not without dangers; in 2018, two LHWs were killed while conducting their rounds to vaccinate for polio. They experience suspicion, are frequently disrespected in their positions, and are sometimes associated with American interests in Pakistan. They do not receive a living wage and are forced to reckon with deep-rooted beliefs surrounding health practices (Closser and Jooma, 2013). Research suggests that LHWs could provide more reliable services if existing Programme policies took into consideration the nuanced nature of gender, caste and socioeconomic systems that exist in the communities where LHWs work (Jalal, 2011).

4.3 Medical products

A well-functioning health system ensures equitable and necessary access to essential medical products, vaccines and technologies (such as diagnostic tests) of assured quality, safety, efficacy and cost-effectiveness. While access to essential medicines is the main focus of some frameworks describing health systems building blocks, in the context of infectious diseases, other medical products such as insecticide-treated bednets for the prevention of malaria and vaccines can also be critical. As such, medical products for both treatment and prevention are important elements of a strong health system.

Vaccines are one of the most cost-effective public health measures available; they are referred to as a “best buy” in public health (Ozawa et al., 2016). Delivery of vaccines to marginalized and geographically isolated populations remains an ongoing challenge. Further, the recent antivaccine movement, rooted in false science, has led to spikes in vaccine-preventable illnesses. Roll-out of dengue vaccination in highly endemic countries, as recommended by WHO, has also been affected by reports casting doubts on the vaccine’s safety (Pang et al., 2018). WHO defines essential medicines as medicines that respond to the main health needs of a specific population. These essential medicines should be available at all times, in sufficient amounts, be affordable, and have proven quality, efficacy and safety (Bigdeli, Peters and Wagner, 2014). Strategies to strengthen this component of the health system in South-East Asia include developing national medicines policies and medicines regulations, medicines procurement and supply systems, measures to address substandard and counterfeit medicines, means for financing to ensure affordable prices, and fair intellectual property rights and international trade agreements. National medicines policies exist in several countries of the region, including Cambodia (Cambodia MoH, 2010), Malaysia (Malaysia MoH, 2012) and Indonesia (Roughead et al., 2013). However, limited data are available relating to the availability of medicines, public procurement, prices, rational use and compliance with standard treatment guidelines. There may be growing attention to the latter in the context of increasing AMR and inappropriate antibiotic use, which is found widely in the region. In many Asian countries, there is a potent mixture of supply and demand that fuels inappropriate antibiotic use: on the demand side, pervasive beliefs that antibiotics can cure a range of ailments without any adverse effects is an important driver of misuse (Om et al., 2017); and on the supply side, unregulated drug sellers are dependent on customer demand and satisfaction (Holloway et al., 2017; Liverani et al., 2018).

Access to medical products is, of course, linked to service delivery and availability of pharmacies. In Cambodia, for example, there are regulations on who can sell medicines, but there is an enormous challenge of geographical equity (Box 4.3) (Khan et al., 2011; Yang et al., 2004).

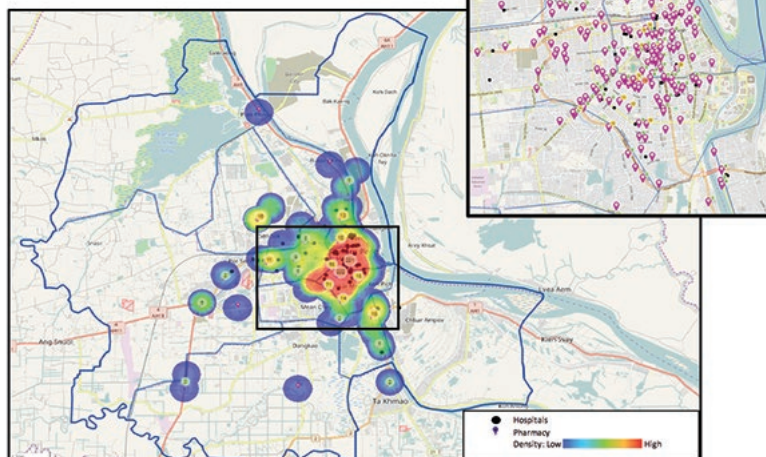
Box 4.3 Registration of pharmacies and access to medicines in Cambodia

In Cambodia, only pharmacies and outlets that are registered with the MoH can legally sell antibiotics in the private or public sector. The Department of Drugs and Food (DDF) is the government authority responsible for the regulation of the pharmaceutical sector, and a list of registered pharmacies is published several times a year.

At present, however, informal drug sellers greatly outnumber registered pharmacies, with an estimated 3000 unregistered drug sellers currently operating alongside approximately 900 licensed pharmacies. Most medications are purchased from these informal drug sellers rather than registered pharmacies.

While overuse use of antibiotics is a pressing health challenge, several communities also lack access to essential medicines and to trained, legally registered HCPs. The proliferation of informal providers must therefore be understood within the broader, social, economic, and geographical realities of LMIC contexts, and efforts to regulate or restrict access to antibiotics must take into account the geographical inequalities that exist in the distribution of licensed HCPs.

Map showing differences in pharmacy density across Phnom Penh, Cambodia. The majority of pharmacies are concentrated in the city center, with very few in peri-urban areas



Source: Khan, Rego and Spencer, 2018

Furthermore, the quality of medicines and diagnostic products is often inadequate, although data are limited as this is a controversial and difficult area in which to conduct robust empirical research. Counterfeit drugs are considered a subset of substandard drugs that are deliberately and fraudulently mislabelled with respect to identity and/or source. A drug can be identified as substandard by analysing the contents. However, determining whether a drug is counterfeit cannot be based on laboratory quality testing alone and requires collaboration with drug regulatory authorities, which are often underresourced. In 2013, a multigovernmental investigation across Cambodia, Indonesia, Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam found that nearly one third of both antimalarials and antibiotics were of poor quality and potentially counterfeit (Weraphong et al., 2013). Similarly, a 2004 cross-sectional survey of pharmacies and drug shops in Myanmar found an "alarmingly high proportion" of counterfeit artesunate used for malaria, although a recent survey provides encouraging evidence that the quality of artemisinin-based combination therapies has recently improved (Dondorp et al., 2004; Yeung et al., 2015). Antibiotics are at particular risk of being targeted by counterfeiters and drug manufacturers who use poor practices owing to the large volumes of antibiotics sold in the human and animal health sectors and their relatively low production cost. The extent to which poor-quality antimicrobial products contribute to AMR in the region is still to be determined.

In the realm of drug production, India's Open Source Drug Discovery initiative (OSDD) was launched in 2008 by India's Council on Scientific and Industrial Research. Designed to develop new medicines for those diseases that drug discovery and development processes had neglected, the initiative first targeted TB, and has broadened its scope to malaria, filariasis and leishmaniasis. The OSDD aims to change the traditional route of research and development of new drugs: students, scientists, clinicians, academics and institutions collaborate through an online platform, and share risks and rewards free from the drug monopoly market. Because it is publicly financed, OSDD can work with generic manufacturers to produce the treatments at minimal cost, and aims to ensure greater affordability for those in need (Bigdeli et al., 2014). It is important to mention that increasing access to medicines in LMICs through lower-cost generic products is

not without some opposition, as illustrated in the case of ART for HIV. Questions have been raised about the quality of generic products, while others point out that stakeholders with the capability to take economic, legal and political steps required to increase the availability of generic drugs may have conflicts of interest, which impede action to increase the availability of generics (Hoen et al., 2011; Shadlen, 2007; Wainberg, 2005).

4.4 Information systems

Health information systems are critical to fully functioning health systems, particularly in the case of infectious diseases with epidemic potential, which need to be monitored in real time to avoid spread. Health information is used by policy-makers, HCPs and the public to track health systems' performance, formulate health education and training programmes, finance health services, and govern and regulate health initiatives (WHO, 2018f). While similar to monitoring and evaluation, health information systems have wider objectives, such as enabling planning, stimulating research and aligning global reporting (WHO, 2010a). Surveillance is particularly essential for identifying and controlling infectious diseases. It helps to detect emerging problems, identify geographical clustering of human or animal disease, track recrudescence after control activity, and provide evidence on which to base policy decisions. A good surveillance system is a cornerstone of an effective and sustainable disease control system. It is dependent on comprehensive health information systems, supported by readily available and appropriate diagnostic tools.

Most Asian LMICs, with some exceptions (*see* Box 4.4. China case study), need to improve their national health information systems such that they can gather individual-level data, health facility-level data, population-level data and have a comprehensive and reliable health surveillance system. The performance of a country's health information system can be broadly grouped into two categories: indicators related to data generation, such as census data and surveys, and indicators related to a country's ability to analyse and validate data. A further regional challenge is the sharing of data across national boundaries (Liverani et al., 2018).

An example of a strong infectious disease information system is China's TB surveillance and monitoring system, a real-time, web-based electronic

recording and reporting system, which collects information on TB cases from all health facilities responsible for diagnosing and treating TB (Box 4.4) (Khan et al., 2017).

Box 4.4 Case study: China's tuberculosis information management system (TBIMS)

- China first launched a web-based infectious disease reporting system in 2003 in response to a SARS outbreak.
- Following the successful implementation of the infectious disease reporting system, the Chinese Center for Disease Control and Prevention (CDC) developed the TBIMS in 2005.
- The TBIMS consisted of three linked databases covering all pulmonary TB and extrapulmonary TB cases, patients with presumptive MDR-TB and those with confirmed MDR-TB.
- The system covers 3200 TB health facilities at province, prefecture and county levels across the country, with an estimated 20 000 users entering data into the system.
- The TBIMS collects information on patients' demographics, diagnosis and treatment of TB, delay to diagnosis, diagnosis of presumptive MDR-TB cases and treatment of confirmed MDR-TB patients.
- Reports are published on a regular basis and shared by the Chinese CDC and MoH.

Source: Khan et al., 2017

There are challenges to running information systems for infectious diseases; LMICs have to work on a limited budget, and data inputs come from a wide array of sources, ranging from community health workers to hospitals. This array of data, while essential to developing a quality health information system, also can be affected by incentives to avoid reporting certain infectious disease outbreaks, lack of capacity and varying incentives for managing data (Buckee et al., 2018). For zoonotic diseases such as avian influenza, there are specific challenges with coordinating information exchange between the human and animal health sectors, which often work with few linkages to facilitate communication. Furthermore, there are often disincentives to reporting outbreaks of avian influenza and

other infectious diseases that may result in travel or trade restrictions on reporting countries.

Another challenge to setting up effective information systems is global migration patterns, especially those around conflict zones, which have a severe effect on health outcomes, and are particularly hard to monitor through routine information systems. As of writing this, the Rohingya people of Myanmar are currently being displaced, internally and externally, in acts of genocide. Nearly half a million people have been expelled from Myanmar and have fled to Bangladesh – an LMIC with its own challenges (Chan, Chiu and Chan, 2018). Those displaced face poor sanitation infrastructure, temporary shelter and food insecurity, a perfect storm for infectious disease outbreaks without adequate information systems to inform actions.

International disease-specific funders have boosted the overall surveillance of certain diseases. One example of this is the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), which has results-based monitoring. This has put pressure on governments and NGOs that receive funds to provide tangible results, based on hard data. This, consequently, has emphasized the calibre of the data collected, though it remains disease specific and may mostly remain contingent on foreign funds (WHO, 2010a). The Fleming Fund is a recently initiated UK Government aid programme that is supporting countries in South and South-East Asia (and elsewhere) to set up surveillance systems to collect high-quality data on AMR, which is shared nationally and globally.

4.5 Financing

Although economic growth in Asia has been substantial in recent decades, large population groups are unable to access health care owing to financial barriers or are driven into poverty because of catastrophic expenditure on health. Health systems that provide universal coverage and affordable access to the poor and disadvantaged both improve health and fight poverty. Therefore, financing – which involves appropriately mobilizing, pooling and allocating money to sustain health delivery programmes – is essential for building an equitable and efficient health system.

Levels of private out-of-pocket (OOP) health spending are extremely high (over 50% of total expenditure on health) in many countries in the South and South-East Asia region (WHO, 2009), reflecting high private sector usage, as described earlier. Malaysia, Thailand and Sri Lanka are notable exceptions, and comparisons across Asian countries have found that these three countries have a lower incidence of catastrophic expenditure on health (van Doorslaer et al., 2007) (Table 4.2).

Table 4.2 Key indicators on health expenditure from selected countries in South and South-East Asia, 2015

Country	Health expenditure, total (% of GDP)	Domestic general government health expenditure (% of total health expenditure)	Out-of-pocket expenditure (% of total health expenditure)
Bangladesh	2.6	14.7	71.8
India	3.9	25.6	65.1
Indonesia	3.4	33.2	50.2
Malaysia	3.9	52.9	34.7
Myanmar	4.9	23.0	73.9
Pakistan	2.7	27.5	66.5
Philippines	4.4	31.4	53.5
Thailand	3.8	75.8	12.2
Sri Lanka	3.0	53.7	38.4

Source: WHO, 2018g

At the national and subnational levels, which components of the health system the available funding is allocated to is another issue, as this affects efficiency. It is estimated that 80% of essential health interventions can be delivered at the primary care level, but an average of only 10% of health resources are used for primary-level care in Asia (WHO, 2009). In addition, strategic purchasing, involving the transfer of pooled funds to HCPs to secure services for a population, can increase health system equity, efficiency and quality. Critical elements of strategic purchasing include identifying an appropriate package of services to be purchased, and choosing optimal service providers (Patcharanarumol et al., 2018).

At the supranational level, aid effectiveness, including alignment and harmonization of official development assistance (ODA) with national priorities, is a critical challenge in the region. The influence of governments, multilateral agencies and private agencies that provide funds or conduct

activities with the stated aim of improving health in LMICs (collectively termed “donors”) remains prominent in the health policy process of recipient countries (WHO, 2012). A recent study, one of the few to investigate the perspectives of domestic policy-makers in Asia, found that control of financial resources was the most commonly identified route by which donors influenced health priority-setting and policy implementation in Cambodia and Pakistan (Khan et al., 2018).

For many infectious diseases, control programmes in Asian LMICs are primarily funded by external agencies, commonly known as development assistance for health (DAH). In 2017, global DAH amounted to \$37.4 billion, and HIV/AIDS received the most funding of any health area (\$9.1 billion, 24%) (Global Burden of Disease Health Financing Collaborator Network, 2018). In the case of TB, DAH totalled \$1.7 billion in 2017, much less than HIV, despite the larger number of deaths caused by TB globally and in Asia. Development assistance for infectious diseases is channelled through many international agencies, including international NGOs and the Global Fund. The Global Fund plays a major role, particularly for TB. In 2017, 21.4% and 62.3% of all HIV and TB funding, respectively, passed through the Global Fund (Institute for Health Metrics and Evaluation, 2018a).

The Global Fund provides “performance-based funding”, which means that continued financial support is dependent on meeting predetermined targets, such as treatment adherence and completion rates for TB patients initiated on therapy and ART initiation for HIV patients (The Global Fund, 2018). Tying of future funding to performance has implications for LMICs. For instance, when TB control programmes are considering expansion of TB services to underserved populations, such as those living in rural areas and conflict zones, policy-makers are faced with a difficult decision: do they prioritize unmet health needs and take on the risk that service delivery to hard-to-reach populations could jeopardize “performance” against targets and future funding? This situation occurred in Myanmar in 2015, when drug-resistant TB treatment was available only in one third of the country; there were clear tensions between the push to scale up access to treatment, lack of infrastructure to support scale up in underserved areas and the need to meet performance targets to secure future funding (Khan et al., 2017). Reliance of LMICs on external donors for research funding can also be

problematic as the research priorities of funders or international researchers may not align well with national policy-makers' priorities (Boudarene et al., 2017; Khan MS et al., 2018).

4.6 Service delivery

In the context of infectious disease control, good health services are those that deliver effective, safe, and quality personal and non-personal health interventions to prevent or respond to new infections, providing care to those who need them, when and where needed, with minimum wastage of resources. This includes being able to rapidly increase the level of service provision delivered during outbreak situations (known as surge capacity) (Watson, Rudge and Coker, 2013). Essential elements of the health service go beyond clinics and hospitals to include diagnostic laboratories, community-based care providers, pharmacies and cold-chain systems for vaccinations.

Good health service delivery is dependent on other components of the health system working together optimally. In many Asian LMICs and elsewhere, service delivery is compromised owing to inadequate financing; this makes it difficult to provide the right mix of health workers, the systems to make medicines and medical technologies available, and the data to inform responses to control infectious diseases as needed in the region. Potential improvements in service delivery must therefore be considered in light of the challenges discussed with respect to other components of health systems.

Despite a rise in attention to strengthening service delivery at the primary care level following the International Alma-Ata Conference in 1978, in the past two decades, there has been a focus on improving service delivery through disease-specific ("vertical") global health initiatives, such as HIV and TB control programmes. In contrast to vertical initiatives, a horizontal health system is a system of broad services that includes prevention and care services for locally prevailing health problems. Vertical programmes are prominent in LMICs where primary health services are underdeveloped. Primary care provided close to patients' homes has, therefore, remained weak in many countries; this means that patients with early symptoms of infectious diseases often delay seeking care or seek care

from untrained providers, which can result in avoidable transmission and/or the development of AMR. Better integration of vertical programmes into the primary health care system and with other disease control programmes may improve service delivery and is being supported, for example, in the case of HIV in Thailand. Thailand's National AIDS Programme has been effective in reducing the transmission of HIV on a national scale since the 1990s. A strength of the national response to HIV has been the government's financial ownership of the programme, and the fact that Thai domestic resources have accounted for the majority of funding for the AIDS response. While ART remains centrally managed, clinical services for opportunistic infections have been integrated into the national health insurance system (Siraprasasiri et al., 2016). However, it is important to consider that stronger evidence is needed on the impacts of integration and what elements of integration (financing, strategic planning, service delivery) are or are not helpful in different contexts.

The role of the private sector in service delivery varies between countries, and the optimal role of the private sector remains contentious. It is important to remember that the private sector is not a homogeneous group, but rather a collection of diverse HCPs. Broadly, private providers include persons operating outside of the government-financed system, alone or in groups, to provide diagnosis, treatment or advice to individuals for health-related concerns. In South and South-East Asia, as in other regions, the private sector includes a variety of providers, ranging from large private hospitals, small clinics and pharmacies to roadside informal drug vendors and traditional healers. The level of training varies greatly. Some private practitioners have no training, or claim to have qualifications that they do not have, while others have several years of specialist training. In addition to allopathic HCPs, there are alternative therapeutic approaches, which include homeopathy and traditional healing. Private providers also vary in terms of the fees charged. Some are highly priced and accessible only to a fraction of the population while others are more accessible and may offer flexible payment arrangements (Khan, Salve and Porter, 2015). Social franchising is a model that involves a manufacturer or marketer of a product or service (the franchiser) granting rights to local independent entrepreneurs (franchisees) to conduct business in a prescribed manner with the aim of attaining a social gain such as health improvement. As

summarized in Box 4.5, this model has been used by Population Services International (PSI) in Myanmar for malaria and TB (Lonnroth et al., 2007; PSI, 2018).

Studies indicate that private providers are preferred owing to shorter waiting times, increased time spent with doctors, cleanliness of facilities, longer and flexible opening times, and better availability of staff. Stigma associated with diseases such as HIV results in some patients opting for private providers who they feel will maintain confidentiality (WHO, 2010b).

Box 4.5 Case study: Population Services International (PSI) in Myanmar

To strengthen regulation of the private sector, PSI Myanmar initially established the Sun Quality Health (SQH) network, which included primarily licensed physicians, to offer family planning services to the low-income population in 2001. Other services for malaria and TB were added subsequently (Lonnroth et al., 2007).

PSI Myanmar provided training and free or subsidized medical products to network members. In return, members were required to meet service standards, receive regular monitoring visits by the franchiser and ensure an affordable service price to the low-income population (Bishai et al., 2013; Lonnroth et al., 2007).

Evidence shows that PSI Myanmar improved service quality and access to services by the low-income population. In an evaluation study, HCPs in the PSI malaria programme performed better in managing malaria after participating in the programme (Aung, 2012). Another study reported that in urban areas, TB patients who visited SQH clinics were poorer than the general TB-positive population (Montagu et al., 2013).

4.7 Health systems performance

Weaknesses in the key components of building blocks of the health system – human resources, information systems, medical products, financing and governance – impact on the performance of health systems in preventing and treating infectious diseases as well as other population health concerns. In this book, health systems performance is characterized in terms of quality of health care, people-centredness and resilience.

4.7.1 Quality of health care

There are quality issues with the management of infectious diseases in both the private and the public sectors. Quality has two major components: service quality, which includes the responsiveness of staff, and is often measured by patient satisfaction; and technical quality, which incorporates the competence of providers and their adherence to clinical guidelines. Often, the private sector performs better on service quality, since for-profit providers' business model depends on satisfied customers. By contrast, technical quality across a range of private providers seems to be low, as it is in the public sector. In the private sector, technical quality it is more variable. Low technical quality has been documented not only in private clinics but also with respect to laboratory diagnostic services. Shocking examples of low technical quality include: specific private laboratories in Pakistan providing false-negative TB test results (Codlin et al., 2012), a "doctor" in Cambodia infecting 82 people with HIV (Pring, 2014), and inappropriate drug dispensing by drug sellers in India and Lao People's Democratic Republic (Stenson et al., 2001). Improvements in the quality of health care require better governance and implementation of regulations, higher skill level of HCPs and wider coverage of information systems to include the private sector.

4.7.2 People-centredness

A health system that is people-centred places the needs and preferences of individuals (including service users, health workers and health managers) and community groups at a high priority when planning day-to-day operations. This necessitates appropriate financing to enable service delivery close to communities, adequate time allocated for HCPs to attend to patients and a governance system that balances the needs of different health systems' stakeholders (Abimbola et al., 2014). In this context, universal health coverage (UHC) has been defined as "access to key promotive, preventive, curative and rehabilitative health interventions for all at an affordable cost, thereby achieving equity in access" (WHA, 2011). This requires government health spending to be focused on the poor, accounting for differences in the cost of accessing health care by different geographical, demographic and socioeconomic groups. Indonesia's national health insurance scheme, the Jaminan Kesehatan Nasional (JKN)

is an example of a large domestically led initiative that aims to make comprehensive care available to the entire population by 2019 (Pisani et al., 2017). Specifically, it seeks to address the high fragmentation of health care in the country, with private insurance schemes for those who can afford it, basic State provision for the poorest, and many groups – such as informal workers – falling into gaps with limited access to quality health care.

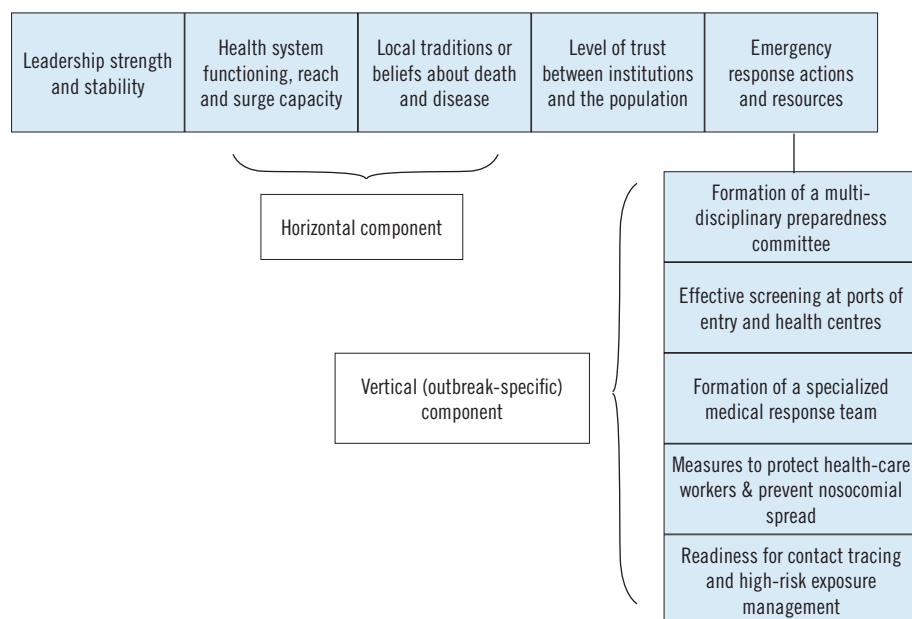
4.7.3 Resilience

The effectiveness of the health system depends on its capacity to serve the population, including hard-to-reach groups, as well as its capacity (in terms of human resources, information systems and laboratories, for example) to respond appropriately to a sudden increase in workload (Watson, Rudge and Coker, 2013). The latter is often described as resilience (Kruk et al., 2015). Recent infectious disease outbreaks highlight that health systems need not only to be stronger but also more resilient if health security is to be ensured. They must have surge capacity for those who are a part of the outbreak, as well as the ability to provide access to routine health services during an outbreak. South-East Asia is particularly at risk of outbreaks, which can test health systems' resilience; there have been serious economic and health-sector impacts from zoonoses, including Nipah virus infections, SARS and avian influenza (commonly known as bird flu). Resilience is dependent on a combination of broad (horizontal) factors related to the political environment, health system and local population, as well as on targeted disease-specific (vertical) measures to prevent the disease from spreading, as illustrated in Fig. 4.2. A recent analysis proposed that three core health systems components – information system, financing mechanisms and health workforce – intersect with two cross-cutting features: governance, which affects all other system dimensions, and predominant “values” shaping the response, and how it is experienced at individual and community levels (Hanefeld et al., 2018).

An important but overlooked element, which links to patient-centredness, is the level of trust between public institutions and the population. In an outbreak situation, trust will influence how effective outbreak control measures, such as screening, contact-tracing and isolation of high-risk individuals, can work in a specific countries and communities (Khan, Lover

and Coker, 2014). Communities or regions in which the reach of the public health system and institutional trust is low will be at an inherently higher risk of an outbreak as control measures are likely to be implemented slower and less effectively.

Fig. 4.2 Framework for assessing resilience and preparedness



Source: Khan, Lover and Coker, 2014

4.8 Conclusions

Weaknesses in health systems within Asian LMICs has meant that infectious disease control measures ranging from prevention, early diagnosis, and prompt treatment initiation and completion have not been optimally implemented. These weaknesses, in part, result in avoidable deaths, disability, loss of productivity, stigma and catastrophic costs. More is known now about which elements of the health system need to be strengthened and how challenges vary between countries, and examples of locally appropriate strategies have been provided in this chapter. It is also being recognized that long-term improvements in infectious disease control may be supported either through a shift away from strategies that are

very disease specific (e.g. HIV, TB, malaria) or issue specific (diseases with pandemic potential), or by including in these strategies diseases of similar epidemiology to gain from their synergy by focusing on elements that are critical across multiple health areas, including UHC.

Ultimately, strengthening of health systems will be evident through the availability of good-quality, affordable, people-centred health services for the diverse range of infectious diseases affecting Asian populations. This relies on appropriate human resources to deliver prevention services and care, medical products to enable front-line health professionals to work effectively, and information systems to monitor and share information in a timely manner, which is particularly essential for the prevention and control of infectious disease outbreaks that periodically affect the region.

Improvement in these elements is dependent on adequate financing and governance systems, which may, consequently, need to be the first components addressed.

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PART II

Chapter 5. Cambodia

Krishna Hort, Por Ir, Keovathanak Khim, and Peter Leslie Annear



5.1 Introduction¹

Cambodia is experiencing a demographic and epidemiological transition, with reducing birth rates and ageing of the population, and an increasing proportion of ill-health arising from NCDs. Strong economic growth has led to a reduction in the proportion of the population living in poverty, and a transition from low-income- to lower-middle-income country status. Health status has improved markedly in recent years, with significant reductions in maternal and child mortality rates (Annear et al., 2015).

An ongoing process of national health reform began in the 1990s with expansion of the physical infrastructure (district hospitals and health centres), and is continuing through innovations in health financing and access to services. Development partners have been important contributors to the reforms and have helped shape policy-making. A series of major strategic policy documents have culminated in the recent Health Strategic Plan 2016–2020 and the National Social Protection Policy Framework 2016–2025 (MoH, 2016; RGC, 2017). Reforms are now focused on moving towards UHC; as in other countries, providing coverage for the informal sector is a challenge.

Current health system challenges include: overall health outcomes that are poor in comparison with global and regional averages; the persistence of urban–rural and rich–poor disparities in health status; weaknesses in the quality of service delivery as well as in access to health services; the still high proportion of THE that is sourced from OOP expenditure; the need to increase the health workforce and the capacity of health facilities to address the growing burden of chronic illnesses and NCDs; and inadequate regulation of the private sector.

5.1.1 Economic and political context

During the past two decades, Cambodia has had a stable government and strong economic growth with a considerable reduction in national poverty levels. Annual growth in GDP averaged 7.7% (at constant price 2000) over

¹ We acknowledge the work of the authors of The Kingdom of Cambodia health system review (Asia Pacific Observatory on Health Systems and Policies): Peter Leslie Annear, John Grundy, Por Ir, Bart Jacobs, Chean Men, Matthias Nachtnebel, Sophal Oum, Ann Robins and Chhun Eang Ros.

the period of 1996–2015 and is expected to remain at 7% during 2014–2019 (RGC, 2014). As a result, the official national poverty rate declined from 47.8% of the total population in 2007 to approximately 13% in 2015, and continues to fall (Table 5.1), partly due to increased urbanization together with improvements in agriculture and rural infrastructure.

However, the gains have not been equitably distributed. While incomes in urban areas have grown rapidly, life in rural areas remains largely based on subsistence rice production. Consequently, the Gini index increased from 38.3 in 1994 to 41.9 in 2005 (World Bank, 2018); with economic growth and a general decline in official (largely rural) poverty levels, the index fell to 30.8 in 2015 (United Nations Development Programme, 2016).

There have also been significant improvements in the social determinants of health, in education (school enrolment), rural development (improved sources of water and access to toilet facilities), and access to roads and public transport services. The female literacy rate in 2014 was 81% and male literacy rate 90%, and 65% of households had access to improved drinking water (95% urban, 60% rural). Measured according to the Human Development Index, Cambodia has had the fastest improvement in living conditions among all Asian countries in the past four decades: rising from 0.306 in 1980 to 0.563 in 2015 (United Nations Development Programme, 2016).

Table 5.1 Cambodia: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	6.7	9	12.2	14.3	15.5	16
Population density (people per sq.km of land area)	37.9	50.8	68.8	81.1	87.9	90.7
Fertility rate, total (births per woman)	5.9	5.6	3.8	2.9	2.6	..
Birth rate, crude (per 1000 people)	45.9	42.4	28.1	25.5	23.7	..
Death rate, crude (per 1000 people)	43.9	12.7	9.4	6.5	6.1	..
Population growth (annual %)	-1.1	3.2	2.2	1.5	1.6	1.5
Population ages 65 and above (% of total)	2.7	2.9	3.1	3.7	4.1	4.4
Population urban (%)			17.5	19.8		21.0 (2016)

Table 5.1 Cambodia: Socioeconomic indicators 1980–2017 (contd)

Indicators	1980	1990	2000	2010	2015	2017
Age dependency ratio, old (% of working-age population)	4.8	5.5	5.6	5.9	6.4	6.9
Age dependency ratio, young (% of working-age population)	73	83.8	75.2	52.9	49.2	48.6
GDP (current US\$, billions)	3.7	11.2	18	22.2
GDP per capita (current US\$)	302.6	785.7	1163.2	1384.4
GDP growth (annual %)	10.7	6.0	7.0	6.8
Gross national expenditure (% of GDP)	111.8	105.4	104.4	103.4
Tax revenue (% of GDP)	10.0	14.2	..
Industry, value added (% of GDP)	21.7	21.9	27.7	30.9
Agriculture, forestry and fishing, value added (% of GDP)	35.7	33.9	26.6	23.4
Services, value added (% of GDP)	36.9	38.3	39.8	39.7
Labour force, total (in millions)	..	4.0	5.6	8.1	9.0	9.3
Unemployment, total (% of total labour force) (modelled ILO estimate)	2.5	0.3	0.2	0.2
Poverty headcount ratio at national poverty line (% of population)	53.2 (2005)	22.1	17.7	..
Income inequality (Gini coefficient)	41.9 (2005)	36.0	30.8 ^a	..
Personal remittances, received (% of GDP)	2.8	1.4	2.2	1.7
Current health expenditure (% of GDP)	6.4	6.9	6.0	..

Key: GDP: gross domestic product; ILO: International Labour Organization

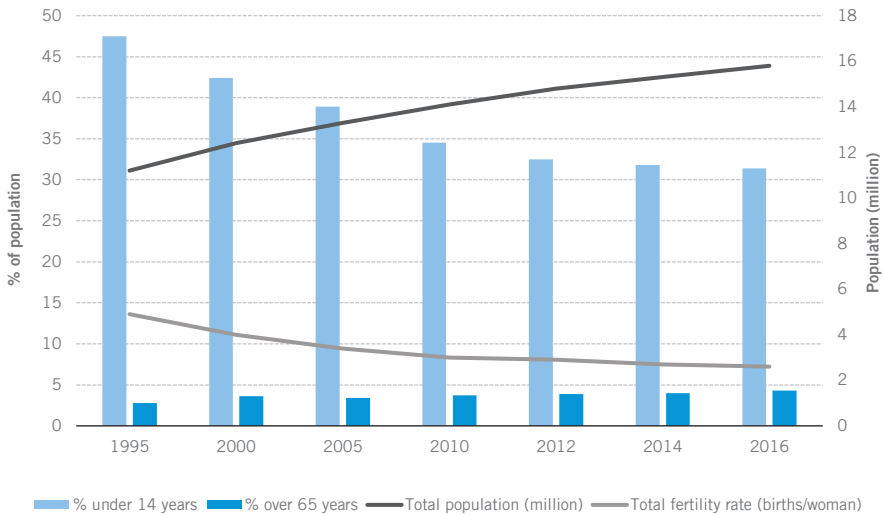
Sources: World Bank, 2018; ^a United Nations Development Programme, 2016

5.2 Health status and risk factors

The Cambodian population is gradually ageing and slowly urbanizing. Population growth has slowed over time to 1.6% per annum in 2016 (Table 5.1; Fig. 5.1), with the population of the main city, Phnom Penh, growing at approximately 2.8% per annum. The total population was 15.8 million in 2016 and is estimated to reach 16.5 million by 2020. Health-care demand is rising as the population structure changes: 9.8% of the total population are

children under 5 years, 6.5% are aged over 60 years, and 27% are women of reproductive age (15–49 years). Health-care demands for these groups are much higher than for other population groups, and it is anticipated that a significant increase in the proportion of young adults in the population will increase the demand for adolescent and youth reproductive health services.

Fig. 5.1 Cambodia: Population indicators, 1995–2016



Source: World Bank, 2018

5.2.1 Health status

Population health indicators

There have been significant improvements in population health indicators during the period 1995 to 2015 in Cambodia (Table 5.2). Life expectancy at birth increased from 58 years in 1995 to 69 years in 2016; the maternal mortality ratio fell from 340/100 000 live births in 2005 to 161/100 000 in 2016; and under-5 mortality fell from 121/1000 live births in 1995 to 31/1000 live births in 2016. Improvements have been registered also in child underweight and wasting in the past 20 years.

Table 5.2 Cambodia: Health indicators, 1995–2016

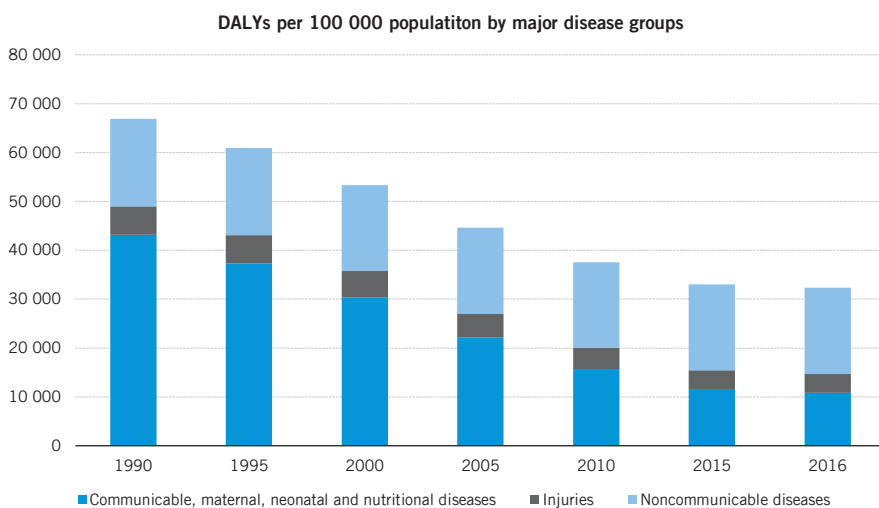
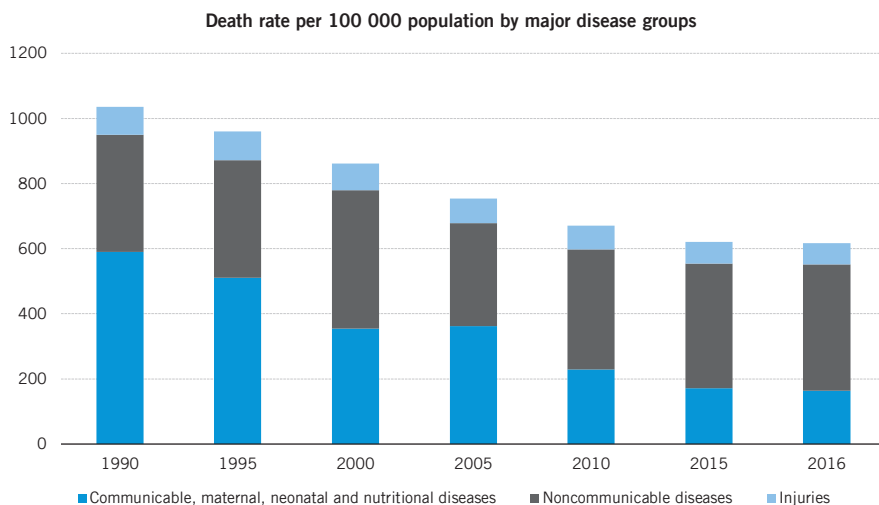
Indicator	1995	2000	2005	2010	2014	2016
Life expectancy at birth (years)	57.8	61.9	67.0	70.6	68.2	69.4
Infant mortality rate (per 1000 live births)	87.6	81.6	51.9	37.3	28.9	26.3
Under-5 mortality rate (per 1000 live births)	121.4	110.5	63.4	43.8	33.7	30.6
Maternal mortality ratio (per 100 000 live births)	750	510	340	250	167	161
Child underweight (%)	42.6	39.5	28.4	29.0	24.2	..
Child wasting (%)	13.4	16.9	8.3	10.8	2.4	..

Source: World Bank, 2018

Burden of disease

Cambodia is also witnessing an epidemiological transition towards a greater prevalence of NCDs – such as cardiovascular disease, cancers, chronic respiratory disease and diabetes – which together are the largest causes of mortality: rising from 30% of deaths in 1991 to 58% of deaths in 2016 (Table 5.3; Fig. 5.2). However, in terms of disability-adjusted life years (DALYs), infectious diseases (respiratory diseases, diarrhoea and others) remain the number one cause, followed by cardiovascular diseases and neonatal conditions. Communicable, maternal and nutritional conditions (maternal and neonatal disorders, HIV/AIDS, malaria, nutritional deficiencies) have moved down the list of causes of disease since 1990, while NCDs and chronic diseases have moved up (cirrhosis, diabetes, chronic respiratory infection, neurological disorders).

Fig. 5.2 Cambodia: Deaths and DALYs per 100 000 population by major disease groups, 1990–2016



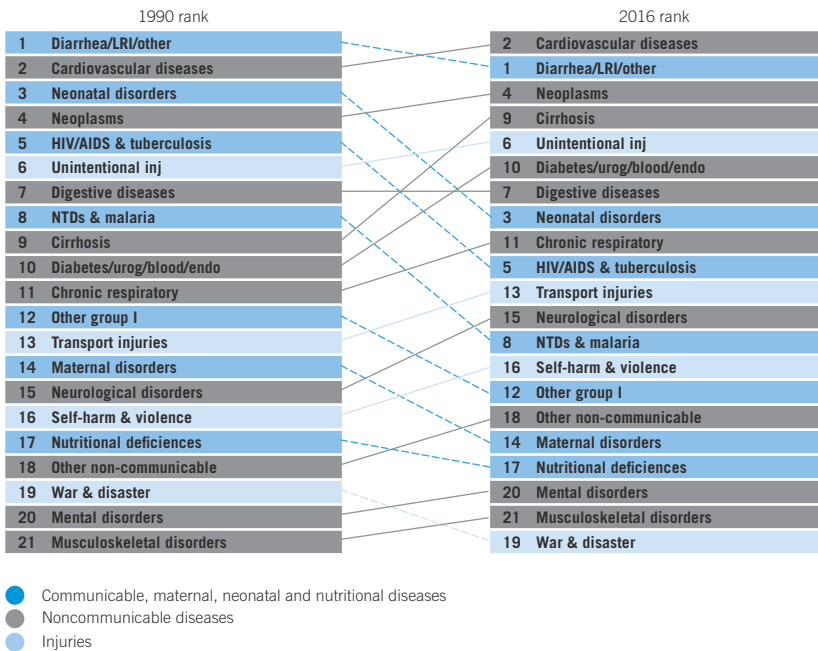
Source: Institute for Health Metrics and Evaluation, 2018

Table 5.3 Cambodia: Leading causes of death and loss of DALYs (% of total), 1990 and 2016

Deaths - 1990		Deaths - 2016		DALYs - 2016	
Condition	%	Condition	%	Condition	%
Infections	36.0	Cardiovascular	24.5	Infections	14.0
Cardiovascular	14.7	Infections	13.3	Cardiovascular	11.5
Neonatal	6.8	Cancer	12.3	Neonatal	8.7
Cancer	5.9	Cirrhosis	7.3	Other NCD	7.3
HIV/AIDS & TB	5.8	Injury	5.3	Cancer	6.8
Injury	4.9	Diabetes	5.2	Injury	5.9
Digestive	3.8	Digestive	4.9	Mental disorder	5.3
Malaria	3.5	Neonatal	4.9	Musculoskeletal	4.8
Cirrhosis	3.4	Chronic respiratory	4.1	Diabetes	4.7
Diabetes	2.6	HIV/AIDS	3.8	Cirrhosis	4.7

Source: Institute for Health Metrics and Evaluation, 2018

Fig. 5.3 Cambodia: Causes of death (all ages, both sexes), 1990 and 2016



Source: Institute for Health Metrics and Evaluation, 2018

5.2.2 Risk factors

There has also been a shift in the distribution of risk factors for morbidity and mortality from 1990 to 2016 (Table 5.4). Behavioural risk factors such as diet, tobacco and alcohol consumption – which caused 55% of deaths by 2016 – rose to the top of the list, compared to 1990 (Fig. 5.4). Metabolic risk factors, such as high BMI, high blood pressure, raised blood glucose and cholesterol, also rose up the list and were responsible for a further 25% of deaths by 2016. In 1990, the leading risk factors were, by contrast, child and maternal conditions. However, for premature death and disability, child and maternal conditions (16%) and air pollution (mainly indoor) (10%) remained the dominant risk factors in 2016 compared to 1990.

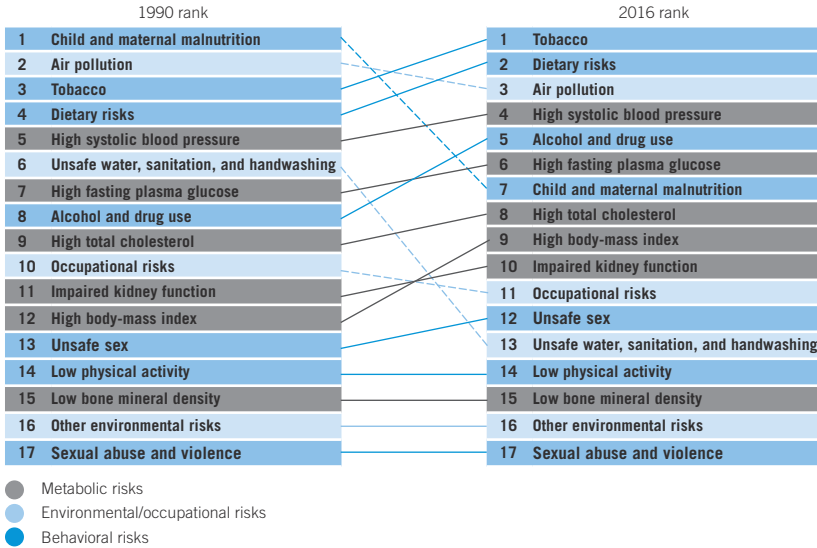
Cambodia therefore faces the dual challenge of an ongoing burden of communicable diseases and a growing epidemic of NCDs. In addition, there is simultaneously overweight and obesity among adults (principally the more well-off) while undernutrition persists among children (mainly in poor families).

Table 5.4 Cambodia: Top ten risk factors responsible for death and DALYs (% of total), 1990 and 2016

Deaths - 1990		Deaths - 2016		DALYs - 2016	
Risk factor	%	Risk factor	%	Risk factor	%
Child and maternal	23.0	Tobacco	29.9	Child and maternal	15.7
Air pollution	16.9	Diet	15.1	Air pollution	10.2
Tobacco	11.9	Air pollution	15.0	Tobacco	8.8
Diet	9.2	High BP	11.7	Diet	7.8
High BP	7.0	Alcohol	9.8	Alcohol	7.2
Unsafe water	6.1	High blood glucose	8.0	High BP	5.3
High blood glucose	3.9	Child & maternal	8.0	High blood sugar	4.7
Alcohol	3.2	High cholesterol	4.7	Occupational	4.0
High cholesterol	2.8	High body mass	4.3	High body mass	2.8
Occupational	2.8	Impaired kidney	3.5	High cholesterol	2.4

Source: Institute for Health Metrics and Evaluation, 2018

Fig. 5.4 Cambodia: Leading risk factor for death (all ages, both sexes), 1990 and 2016



Source: Institute for Health Metrics and Evaluation, 2018

5.3 The health system

Cambodia has a mixed public–private health system for the delivery of public health services, under the direction of the MoH. Government health services include a network of tertiary and secondary hospitals, primary care health centres (HCs) and health posts (HPs), organized in health operational districts (ODs) that are defined by the MoH according to population coverage (*see* Table 5.5 for a summary of terms).

5.3.1 Organization and governance

The MoH is mandated to lead and manage the entire health sector (public services as well as the private sector). While the public sector is the prominent provider of preventive services and inpatient admissions, the disparate private sector tends to dominate provision of outpatient curative consultations. Private providers outnumber public providers, but are mostly small scale, and regulation of the private sector remains weak.

Public sector health service delivery is organized through the MoH into three tiers: the national level, provincial/municipal level and the health OD.

- The national level (located at Phnom Penh) includes the central MoH administration together with national centres for disease control and the national hospitals.
- The provincial/municipal level (including the capital city of Phnom Penh) is the interface between the central and OD levels within the MoH system; the provincial/municipal boundary follows the national political or administrative boundaries established by the Ministry of Interior.
- The OD is a population-based catchment unique to the government health system and established originally by the 1995 Health Coverage Plan; it is the most peripheral subunit of the health system; each OD reports to the provincial or municipal health department of the location in which it operates; and each has one referral hospital and a designated number of health centres. ODs do not have the same geographical boundaries as the Ministry of Interior administrative districts.

The term “referral hospital” is applied to all provincial, municipal and district (OD) hospitals, all of which provide referral services to lower levels of service delivery within the government system. The term “district hospital” is synonymous with OD hospital. The delivery of government health services within this system follows a defined package of care at each level, the minimum package of activities at primary care health centre level and the complementary package of activities at various levels of hospital service delivery (*see* Table 5.5).

Table 5.5 Cambodia: Health system terminology

Terms	Definition	Number c.2016
Operational district (OD)	A geographical area defined by the MoH for the administration and delivery of government health services. Used exclusively for the delivery of health services. Includes a population catchment of 100 000–200 000 supported by one referral hospital and 10–20 health centres and managed by an MoH OD office.	94 ODs (the number is growing as the population expands over time) that include the national population of all ADs
Administrative district (AD)	Defined under the Ministry of Interior as the national political unit below the level of province. OD boundaries do not align with AD boundaries. The MoH is now considering the idea of dissolving the OD structure in favour of returning to AD boundaries for health administration.	The national population is divided geographically into 197 ADs. ADs have no relationship to the health delivery system.
Referral hospital (RH)	A tertiary- or secondary-level hospital within an OD that serves the OD population. Where a provincial hospital lies within an OD it serves as the OD referral hospital for all health centres in the OD; where there is no provincial or municipal hospital a designated secondary-level district hospital serves as the referral hospital.	A total of 102 nationally (including all national hospitals, provincial/municipal hospitals and district hospitals)
National hospital	The highest level of care in the MoH health delivery system; delivers tertiary-level care as designated by the complementary package of activities (complementary package of activities [CPA]-3).	A total of 9 located in Phnom Penh
Provincial/municipal hospital	Each of Cambodia's 25 provinces and municipalities has a single provincial/municipal hospital providing tertiary-level care (CPA-2).	A total of 25 nationally in Phnom Penh and each provincial capital
District hospital	A hospital that serves the population of a single OD; there is generally only one district hospital per OD; delivers a complimentary package of activities (CPA-1).	A total of 68 OD-based district hospitals
Health centre (HC)	The lowest official level and generally the first point of contact of the MoH health delivery system; a subunit of the OD and serves a population of 10 000–20 000 with primary care services.	A total of 1141 nationally in 94 ODs

Table 5.5 Cambodia: Health system terminology (contd)

Terms	Definition	Number c.2016
Health post (HP)	In remote areas with low population density, HPs have been established by the MoH to function as the lowest level of the OD health system and first point of contact.	107 HPs across the 94 ODs
Minimum package of activities (MPA)	A defined package of primary care activities mandated for delivery at every health centre, which includes initial consultation, primary diagnosis, emergency first aid, chronic disease care, maternal and child health care, birth spacing advice, immunization, health education and referral.	
Complementary package of activities (CPA)	A defined package of secondary- and/or tertiary-level activities for delivery at OD referral hospitals (provincial, municipal and district hospitals) at three sublevels:	
	*CPA-1 hospitals have no large-scale surgery, no blood bank or blood deposit, but offer basic obstetric services.	CPA-1: 33 hospitals at this level in 2011
	*CPA-2 hospitals provide CPA-1 level care plus emergency care services and large-scale surgery, ICU, and other specialized services such blood transfusion, ear–nose–throat (ENT) consultation, ophthalmology and orthodontic services.	CPA-2: 31 hospitals at this level in 2011
	*CPA-3 hospitals provide the top level of care, including general anaesthesia and more activities than a CPA-2 hospital.	CPA-3: 26 hospitals at this level in 2011
Provincial/ municipal health department (PHD/MHD)	The PHD (or municipal department) is the administrative structure within the MoH that organizes and manages government health services within each province or designated municipality.	25

Source: By the authors

The private sector

The rapidly expanding private for-profit sector is an important provider of health services, especially non-hospital curative care. Private health expenditure is 60% of total health expenditure, with services provided principally by private providers. Private practice, while it is mainly concentrated in urban and economically advantaged areas, is also becoming

pervasive in rural areas. The MoH reports that there were 10 184 formal private providers/facilities by 2017 (excluding at least 2156 pharmacies and depot pharmacies), ranging from nursing care, pregnancy care, physiotherapy and consultation cabinet to clinic, polyclinic and hospital. Private health care is the dominant source of care for the ambulatory treatment of illnesses, but less dominant for inpatient care, and plays only a limited role in the delivery of preventive health services. In rural areas, only 15% of primary care consultations occur in the public sector, and private non-medical (unqualified) providers account for half of all health-care providers (MoH, 2016).

The private not-for-profit sector – comprising local and international NGOs and charities – also plays an important role. Most of these work at district and community level in collaboration with PHDs and ODs (including RHs and HCs) in the delivery of, or in support of, government health services, including curative care as well as health education and promotion activities. Over 180 NGOs were operating nationally in early 2016.

5.3.2 Patient-centredness

One of the central aims of the public health system in the current period is to initiate a range of activities that are designed to improve the quality of care at government health facilities to a level that is responsive to patient needs and effective in improving health-care outcomes. Currently, the MoH and partners agree that the quality of care provided at government facilities needs to improve before the utilization of government services rises significantly. One consequence of this is the apparently increasing rate of travel to neighbouring countries when hospital care is needed.

While there is no clear definition of patient-centred health service delivery or a clear allocation of responsibility for this strategy, the Health Strategic Plan 2016–2020 makes a commitment to patient-centred care in different ways (MoH, 2016):

- through the working principle of accountability, defined as “improving responsiveness and good governance by application of laws and regulations, customs, ethical standards

and norms, with emphasis on patient-centred health service delivery”;

- by encouraging “behaviour change of providers in interacting with patients and consumers of health services and improv[ing] health-care seeking of the population”;
- by strengthening “local accountability mechanisms to improve responsiveness of the health services through participation of community and local administrations in monitoring and providing feedback on health service quality and efficiency”.

Raising the quality of care at public health facilities is at the heart of the donor-government-funded Health Equity and Quality Improvement Project (H-EQIP). This is the country’s main health support project, managed through the MoH. It runs in parallel with, and funds significant parts of, the Health Strategic Plan 2016–2020. Other initiatives to improve quality have been taken through, for example, the Facility Assessment Level 2 process, which provides a baseline for quality monitoring as part of H-EQIP.

Decentralization and autonomy

Within a wider national programme of administrative reform of government services, innovative programmes have been introduced in recent years to decentralize elements of health sector administration and increase the level of autonomy in decision-making of OD and hospital health managers. A first step is the conversion of almost one third of ODs and a number of provincial referral hospitals to the status of special operating agencies (SOAs) by 2018. SOA is a title applied to an OD or provincial referral hospital in which the Director is given greater flexibility in human resource and financial management within the structures of the MoH administrative system (appointments and salaries) and receives funds directly through a performance-based service delivery grant that adds to MoH budget allocations. A proportion of the service delivery grant is allocated to staff incentive payments.

5.3.3 Health financing

Government funding for health care has increased significantly in recent years due to steep rises in tax and other government revenues within a

growing economy. Nonetheless, households are still the predominant source of financing for health care through OOP payments (Table 5.6). The THE has remained at a steady 6–7% of the GDP during the past two decades (which is high in comparison with neighbouring countries), though per capita spending at US\$ 70 in 2015 remains limited. Government taxation revenues contribute on average 20% of THE; an additional 20% of THE comes from donor contributions (mostly in support of government health budget priorities, with a level of nongovernment funding as well). Public expenditure on health care therefore comprises on average 40% of THE while household OOP payments provide 60%.

Government expenditure on health care rose to US\$ 222 million in 2015, equal to 6% of total government expenditure (or 12% of total government recurrent expenditure). In recent years, the donor contribution to government health expenditure has been falling as government budget contributions have risen, reflecting a stronger national fiscal situation. The financial sustainability of the public health system is now a concern for the government, which plans to further raise its share of CHE through budget funding and recently announced social security arrangements.

Table 5.6 Cambodia: Selected health finance indicators, 2000–2015

Indicators	2000	2005	2010	2012	2014	2015
Current health expenditure (CHE) per capita in US\$	19.3	33.4	54.5	69.1	68.1	70.7
CHE as % gross domestic product (GDP)	6.4	7.1	6.9	7.3	6.2	6.1
Domestic general Government health expenditure (GGHE-D) as % CHE	20.2	20.2	19.7	19.4	19.9	22.1
External health expenditure (EXT) as % of CHE	8.5	13.9	22.7	19.4	16.8	18.8
Out-of-pocket (OOP) as % of CHE	70.2	59.2	51.8	60.5	63.1	58.4
GGHE-D as % general Government expenditure (GGE)	8.6	11.6	6.8	6.8	5.9	6.6

Source: WHO, 2018a

The government health budget provides the main source of funds for the public health infrastructure, supplies and staffing, and delivers subsidized care across a standard package of preventive, primary and curative services at health centres and hospitals (through the MPA and CPA). Revenues at government facilities are supplemented by nominal user charges approved

in 1996, with funded exemptions provided widely to the poor through the Health Equity Fund (*see below*). User-fee revenues provide much less than 10% of government spending on health care but constitute a significant source of operating revenues at the facility level.

With a public commitment to moving towards UHC, the government has also confronted the challenge of improving efficiency and cutting wastage across the public health system. For example, more than half the total health budget (excluding salaries) is spent on procurement; of the health budget, a total of 63% is spent on non-programme activities (Annear et al., 2015). Challenges remain in the distribution of budget funding to the lower levels of the health service, and inefficiencies in the purchase of drugs and medical supplies have at times confronted health planners (a 2011 World Bank Public Expenditure Review reported that expenditures on drugs and medical supplies were substantially higher than international average prices) (World Bank, 2011).

The potential for reducing administrative costs and inefficiencies – and increasing access to care – has been enhanced by an ongoing move away from direct budget funding to public health facilities (which is still predominant) and towards demand-side financing mechanisms. Chief among these has been the Health Equity Fund (HEF) for the poor, which originated in two districts in 2000 to reimburse health facilities (RHs and HCs) for the cost of user-fee exemptions provided to the pre-identified poor (who also receive transport and food subsidies). The OD-based HEFs (*see Box 5.1*) now cover all HCs and RHs nationally. Under current plans outlined by the National Social Protection Policy Framework, 2016–2025 and adopted through government regulations, HEF population coverage has been extended to additional targeted population groups, such as local government leaders, and will be expanded further to include people with disabilities, children and the elderly (RGC, 2017). In a limited number of locations, NGOs (local and international) provide voucher schemes for maternal care or voluntary community-based health insurance (CBHI), and there is a limited market for private health insurance.

Box 5.1 Cambodia: Health equity fund

HEFs are Cambodia's principal social protection scheme and are an international example of an effective means to protect the poor from health care costs. The district-based HEFs reimburse health facilities for user-fee exemptions and provide costs for transportation, food and funeral expenses to beneficiaries. The first HEFs were implemented through international NGOs in two districts in 2000 and now operate in every OD, managed through the MoH.

Funded jointly by the government and donors, HEFs are an OD- and hospital-based demand-side financing mechanism used to fund user-fee exemptions for the identified poor at public health facilities. By 2013, HEFs had achieved 16% coverage of the Cambodia population, or 2.2 million people living below the poverty line, and provided reimbursement for 1.1 million outpatient and inpatient visits. By 2015, HEFs provided access to government health services (all hospitals and health centres nationally) for 3.2 million people below the poverty line, funding more than US\$ 10 million in medical and non-medical patient benefits annually.

Beneficiaries are mostly pre-identified prior to seeking care by the IDPoor national household survey process implemented through the Ministry of Planning. In districts not covered by the IDPoor survey, HEF operators carry out post-identification at facilities when necessary. Eligibility for HEF coverage is automatic following pre- or post-identification.

The benefit package provided by HEFs covers the cost of user fees for access to care at HCs and RHs, including all services provided through the MPA (HCs) and the CPA (referral hospitals). Services are provided free of user charges to beneficiaries, and the HEF directly reimburses the cost to the facility monthly. Beneficiaries are reimbursed for the cost of transport, food and funeral expenses directly from the HEF.

Various evaluations have shown that HEFs increase utilization of government services by the poor, reduce OOP expenses, and reduce debt and asset sales for health care (Annear, 2010; Annear et al., 2016; Flores et al., 2013).

Source: Cambodia health system review (Annear et al., 2015)

The government is also working on plans to operationalize a national social security fund (NSSF), including health benefits for civil servants and private sector employees (funded through compulsory salary deductions) along

with other social security benefits (*see* Box 5.2). The NSSF currently provides work injury benefits to private sector and government employees, and is working to introduce health insurance benefits in the near future (though no deadline has been established). Managed as an autonomous agency under the Ministry of Social Welfare, the NSSF has been nominated as the government's national social health protection provider. It will eventually combine the HEF scheme with expanded population coverage, and the

Box 5.2 Cambodia: National Social Security Policy Framework 2016–2025

The National Social Security Policy Framework (NSPPF) is a long-term roadmap focusing on two main pillars: Social Assistance and Social Security.

Social Assistance is divided into four components: (1) emergency response, (2) human capital development, (3) vocational training, and (4) welfare for vulnerable people.

Social Security consists of five components: (1) pensions, (2) health insurance, (3) employment injury insurance, (4) unemployment insurance, and (5) disability insurance.

The Framework addresses four main areas: (1) a legal and regulatory framework, (2) an institutional framework, (3) a financial framework, and (4) human resources.

The NSPPF proposes to investigate the potential for new social assistance programmes, including (among others) a cash transfer programme for pregnant women and malnourished children. It will expand existing social security schemes, including the development of pension and health insurance schemes to achieve universal coverage of all citizens in both the formal and informal sectors. It proposes a feasibility study on an unemployment insurance scheme.

The Framework also proposes institutional reforms, including: establishment of a National Social Protection Council as the policy-level coordinator; a social security regulator to monitor existing schemes; the integration of all social security operators (including the NSSF, the HEF, the fund for veterans and the fund for people with disabilities) into a single operator; and a feasibility study on the establishment of a single social assistance agency to manage all social assistance funds.

Source: National Social Protection Policy Framework (RGC, 2017)

health insurance scheme for civil servants and private sector employees as a single purchaser of government health services (RGC, 2017).

There is a small voluntary health insurance market, comprising private for-profit insurance companies and not-for-profit CBHI schemes, which serve rural communities and urban workers, though coverage is low. Both schemes target non-poor formal- and informal-sector workers who can afford to pay premiums, and the government looks to the possibility that such arrangements may help to extend coverage to the informal sector.

The social health protection initiatives have led to a reduction in health-related poverty. The incidence of impoverishment from health spending (households becoming poor due to health expenditure) fell from 2.5% of households in 2007 to 1.7% in 2013; household catastrophic health expenditure decreased from 5.6% of households in 2007 to 4.9% in 2014. At the same time, the average amount of annual per capita OOP health expenditure increased from US\$ 14 in 2007 to US\$ 69 in 2014 (MoH, 2016).

5.3.4 Physical and human resources

Despite recent improvements, access to health services is constrained by the relatively small size of the health workforce and the low hospital bed-to-population ratio. This is particularly evident in the public health system, and much of private sector service delivery – particularly in diagnostic services and curative, non-hospital care – has emerged to fill the gap. The government has continued to invest in infrastructure for health, particularly by expanding the number of primary care facilities in more remote areas – where HCs increased in number between 2008 and 2017 from 967 to 1190 and continue to expand – while the number of RHs increased from 84 to 117 in the same period (Table 5.7).

Table 5.7 Cambodia: Number of public health facilities, 2017

Facility level	Facility type	Number
Referral Hospitals	National	9
	Municipal/Provincial	24
	District	84
Health Centres	Health Centres	1190
	Health Posts	119
TOTAL		1426

Source: MoH, 2018

Even so, the need to further strengthen public health service delivery is widely recognized as central to MoH plans. The ratio of public hospital beds to population remains low, narrowing only from 1/1490 in 2008 to 1/1446 in 2015 (MoH, 2016) or an average of 0.71 per 1000 population, which is considerably lower than Thailand (2.1) and Viet Nam (3.1). Improved sanitation is available in most public health facilities, including incinerators for medical waste and toilet facilities. The availability of state-of-the-art diagnostic medical equipment, such as magnetic resonance imaging (MRI) or computed tomography (CT) scanners, remains limited and maintenance is an issue; consequently, most of such facilities are provided in the private sector.

The number of facilities in the private sector continues to rise rapidly – moving from a total of 3755 in 2009 to 12 641 by 2017 (MoH, 2016; MoH, 2018) – while the majority remain small clinics and nursing or delivery care rooms (Table 5.8).

Table 5.8 Cambodia: Number of private health facilities, 2017

Types of private health establishments	Number
Patient care room	3959
Consultation cabinet	3695
Pharmacy and subpharmacy	2450
Maternity care room	1156
Dental care room	760
Clinic	281
Polyclinic	56
Medical laboratory centre	54
Dental hospital	47
Medical laboratory	34
Otorhinolaryngology clinic	28
Ophthalmology clinic	24
Dermatology clinic	23
Physiotherapy room	19
Private hospital	16
Maternity clinic	11
Psychology clinic	11
Cosmetic centre	10
Health-care liaison office	7

Source: MoH, 2018

Providing trained staff at the growing number of public health facilities and meeting the demands of a growing population remain challenges, despite the considerable progress. Compared to regional neighbours (according to WHO Global Health Observatory data):

- the population density of physicians is comparable to Lao People’s Democratic Republic and Thailand, though below Viet Nam;
- the density of nurses and midwives is comparable to Lao People’s Democratic Republic, but lower than Thailand and Viet Nam;
- the ratio of nurses and midwives to physicians is in the middle of the regional range.

While the total number of public health personnel has increased – from 18 096 in 2008 to 20 954 in 2015 – the MoH estimates that a total of 36 000 will be required by 2020 to meet service delivery demands (MoH, 2016). Global Health Observatory data suggest, however, that training of new health staff has so far not kept pace with the rise in population numbers (Table 5.9).

Table 5.9 Cambodia: Health workforce density per 1000 population, 1996–2014

Category	1996	2000	2008	2010	2014
Physicians	0.113	0.168	0.244	0.229	0.143
Nurses and Midwives	1.055	0.912	0.842	0.853	0.951

Source: WHO, 2018b

Balancing the expanding number of health facilities with health workforce needs together with a national commitment both to raise the quality of care at government hospitals (including specialist services) and increase coverage of primary care services presents a complex challenge. In these conditions, the distribution of the workforce is as critical as its production:

- by 2015, 79% of the total health workforce was based at the provincial and OD level (MoH, 2016), reflecting the continued

emphasis placed on building rural and primary health care services since the 1995 Health Coverage Plan;

- nurses and midwives together comprise 70% of the national health workforce, with a locally reported 3.47 nurses to each doctor (or up to 6.7 according to the latest WHO Global Health Observatory data for 2014);
- in 2008, 79 out of 967 HCs had no midwife; by 2015 all HCs had at least one primary midwife and 85% had at least one secondary midwife (MoH, 2016);
- more than 40% of general medical practitioners are located at central-level facilities; at central and provincial levels (not including ODs), medical doctors are the largest component of the health staff (MoH, 2016).

At certain times, health workforce development has been directed to meet designated health priorities. During 2010–2015, a major expansion of midwife numbers (increasing by 29% overall) was directed at successfully reducing the unacceptably high national maternal mortality rate. During the same period, the number of nurses rose by a more modest 6% (Annear et al., 2015) and the number of general medical practitioners, specialists, dentists and pharmacists also increased.

The government's University of Health Sciences remains the major provider of pre-service education for physicians, nurses, midwives and pharmacists, although there is a rapid increase in the number of enrolments in private-sector medical universities. The National Institute of Public Health is the main provider of public health training together with five secondary schools for Technical Medical Care (including four regional training centres) and the Health Science Institute of the Royal Cambodian Armed Forces. As well, there is a growing number of private providers of tertiary education for health workers; by early 2016 there were 11 licensed private universities (including one institute) offering a wide range of degree programmes.

5.3.5 Provision of services

The role of the government and public–private mix of service provision is complicated by a number of factors in Cambodia:

- the government is the main provider of the national health infrastructure, and of secondary and tertiary hospital services;
- 60% of THE is OOP spending, with the large majority going to private sector providers;
- two thirds of patients using curative care first go to private providers (NIS, 2015);
- the government is the major provider of public health and preventive health services (including reproductive, MCH, and communicable disease and NCD control programmes).

In principle, the government health-care structure is designed to accommodate referral of patients from primary care to higher levels; in practice, there are no restrictions on patients' ability to choose a provider. During an episode of illness, most patients rely first on home remedies (especially in rural areas) or self-prescribed medication from local pharmacies or drug sellers; people commonly choose to consult private providers ahead of public facilities; if the patient's condition deteriorates, private providers generally refer them to a government hospital. Critically ill or injured patients usually bypass primary care facilities and seek care directly at public or private hospitals without referral (Annear et al., 2015).

Coordination with private providers remains a challenge for government planners. Most private providers are drug shops or single-person practices. Private pharmacists (many unqualified) are a common, frequently accessed, yet inadequate source of self-medication for most people. Most private providers with formal training are simultaneously public employees (dual practice). Access to private hospital care is greatest in urban areas. The registration of all private medical and paramedical facilities was made compulsory under a law adopted in late 2000, though the resources available for monitoring compliance are limited (MoH, 2013; MoH, 2016).

Management of NCDs

The prevention and treatment of NCDs – which comprise more than half of the national burden of diseases – is recognized as a priority in the Health Strategic Plan 2016–2020 and the National Strategic Plan for the Prevention and Control of NCDs 2013–2020 (MoH, 2013). The current capacity to deliver services is constrained and access to treatment is characterized by large inequities favouring wealthy and urban populations (for expensive diagnostic tests and treatment), while few if any services are available for those living outside Phnom Penh. The NCD Strategic Plan identifies four key preventive strategies for common cancers: tobacco control (lung cancer), hepatitis B vaccination (liver cancer), cervical screening and human papilloma virus (HPV) vaccine (cervical cancer). Key strategies to address management of NCDs include: integrated management of NCDs through primary care, enhanced NCD surveillance through a hospital-based cancer registry and risk factor surveys, and strengthened coordination within the MoH and across sectors. Basic screening and treatment for NCDs are included in the MPA at HCs and the CPA at referral hospitals.

Management of CDs, AMR and pandemic preparedness

National centres within the MoH have responsibility for vertical infectious disease programmes, including HIV/AIDS, malaria and TB, with support from the Global Fund. TB control provided through directly observed treatment, short-course (DOTS) has reduced the rates of MDR-TB to 1.4% with a more than 90% success rate. Malaria control has also resulted in reductions in incidence and deaths from malaria, from 219 in 2009 to 10 cases by 2015.

Successful prevention and treatment of HIV has helped to reduce prevalence among adults aged 15–49 years from 1.6% in 2000 to 0.6% by 2014, with over 90% survival after 12 months on ART. With ARVs available to approximately 80% of adults and children estimated to be in need of treatment, the universal access target has been achieved. Since 2015, availability of ART to prevent mother-to-child transmission of HIV has exceeded 80%.

However, there remains a need to improve the national monitoring system for AMR and to strengthen laboratory quality management. Artemisinin-resistant falciparum malaria parasites remain a public health concern, in common with other countries. A National Policy (in 2014) and Strategy (in 2015–2017) were adopted by the MoH and, in December 2017, three key ministries (Health; Agriculture, Forestry and Fisheries; and Environment) met together with the Food and Agriculture Organization (FAO), WHO and the World Organisation for Animal Health at an inaugural national meeting to develop a multisectoral action plan to combat AMR. The plan is due for endorsement in mid-2018 (FAO, 2017).

National structures have been established for pandemic preparedness, as well as national strategies and response plans, and the rapid response teams and interministerial working groups are functioning. Further development of national public health emergency preparedness and responses plans incorporating a multihazard approach has been identified as a priority (MoH, 2016).

Management of MCH

Maternal and infant mortality rates have declined steeply in recent years, partly as the result of innovative programmes through the MoH. In one scheme, midwives are paid a cash bonus (~US\$ 10–15) for each live birth delivered at a health facility. Increased facility access through the HEFs and a number of local maternal health voucher schemes have also played a part. As a result, the rate of skilled birth attendance rose from 44% to 89% and institutional deliveries from 22% to 83% between 2005 and 2015. Nearly 80% of newborns receive a postnatal check-up within two days of delivery, and 93% of children aged 0–5 months are breastfed. Moving above a 75% coverage rate for fully immunized children (achieved nationally by 2015) has been difficult due to provincial variations in primary care delivery; now, almost all HCs have at least one primary and one secondary midwife. Stunting among under-five children remains high at 31.5% (estimated, 2015) (MoH, 2016).

5.4 Health system performance

Starting from a relatively low base, improvements have been evident in both service delivery and clinical quality of care. Addressing the relatively low quality of care at government facilities is at the centre of the Health Strategic Plan 2016–2020.

5.4.1 Effectiveness and quality

Improved clinical care is evident in improved diagnostic capacity as well as reproductive, maternal and child health care. Routine quality-of-care assessment scores at all HCs and RHs within at least 16 provinces (pioneered by the HEF and now generalized) indicate a recent rise in the quality of clinical performance in the range of 34–69% (MoH, 2016). Hospital mortality rates decreased from 1.7% of hospitalized patients in 2008 to 0.97% in 2015. An important part of the plan to raise the quality of care is increased attention to strengthening pre-service medical education within the Health Strategic Plan.

These efforts to improve the quality of government health services are consistent with the wider national programme of government administrative reform. The MoH has been identified as a pilot ministry for trialling innovations in government administration, with increased management autonomy, staff incentive payments and a move to contracting service provision within the MoH.

More than a third of health ODs have already been designated as SOAs for service delivery. The SOA structure provides an increased level of autonomy to OD and health facility managers within the MoH system, including clarifying job descriptions and performance requirements, improving staff discipline, and the provision of incentives (MoH, 2016). Already, SOA status has commenced in 14 provinces at 10 provincial hospitals and 26 ODs with 21 RHs and 394 HCs. Funded partly through the MoH donor H-EQIP, SOAs are supported with a service delivery grant in addition to budget allocations (World Bank, 2017b). The service delivery grant supports running costs and staff incentives, and will now be developed as a performance-based financing mechanism for primary-

and secondary-level health facilities based on the achievement of service delivery results (MoH, 2016; World Bank, 2017a).

A second innovation is the Public Administrative Enterprise (PAE), an institutional structure applied to nominated public agencies and institutions. The PAE structure provides a level of financial and management autonomy to central-level public institutions. Five national hospitals, two health educational institutions, and the national medical laboratory have been granted PAE status. Initial results indicate some improvement in performance, with better management of revenue enabling improvements in basic infrastructure, investment in high-tech equipment, and improved staff motivation through incentives (MoH, 2016).

5.4.2 Access to health care

While the majority of health expenditure is in the private sector, access to health care has increased generally as a result both of the expansion of the government health infrastructure and reduced financial barriers for the poor. A dramatic increase in the utilization of government HCs and RHs has been evident (MoH, 2016; NIS, 2015). This increase was due in part to improved economic conditions and the expansion of the public health network. It was increased by the rapid rise in the number of HCs covered (in addition to all RHs) by HEF benefits, which provide access to government services for the poor. RH inpatient and outpatient visits also increased (Annear et al., 2016).

Consumption of public health services measured by per capita outpatient consultations per year increased from 0.45 in 2008 to 0.61 in 2015: 86% of the total new case consultations were seen by HCs and the remaining 14% by hospitals. Hospital bed occupancy rates increased by about 4% annually, rising from 61% in 2008 to 88% in 2015, and the average length of stay per hospitalized patient was 5 days (MoH, 2016). In rural areas, people predominantly use private sector providers (drug stores 38% of those seeking care, private clinics 35% and private hospitals 3%) and government HCs to a lesser extent; in the capital, people are more likely to use significantly more expensive private hospitals and private clinics.

This ongoing rise in utilization is prompted by significant increases in care-seeking when ill from both public and private providers. Approximately 15% of Cambodians (or 2.3 million) report illness during an average month (according to estimates confirmed by the Cambodia socio-economic survey 2015), with a higher rate in rural than in urban areas. Almost all of these seek some form of care according to the survey data: during 2015 this equalled 63% in the private sector (higher in urban than rural areas), 24% in the public sector (higher in rural than urban areas), with 12% through self-care and 1% other (NIS, 2015). Disadvantaged groups are increasingly being represented in these numbers: for the poor through the HEF; for people with disability, rising to 95% of those who are ill; and for people with chronic diseases rising to 80% in recent years. Care-seeking from formal providers is rising, reaching 82% by 2013, and home care falling to as little as 0.2%. These trends are continuing.

Nonetheless, health outcomes still exhibit urban–rural and rich–poor differentials and are low compared to regional averages. MCH outcomes vary according to socioeconomic status and geographical location: the fertility rate for women in the poorest income quintile is more than double that of the richest quintile; children in the poorest quintile have a threefold higher risk of death before their fifth birthday than those in the richest quintile; stunting is more than twice as common among children in the poorest quintile than in the richest (Annear et al., 2015).

5.4.3 Resilience

With improvements (if gradual) in routine health-care delivery under way, an additional challenge is the capacity of the public and wider health system to adapt effectively to changing environments, sudden shocks or crises, including emerging and re-emerging infectious diseases. Resilience is also a function of the ability to sustain rising health-care costs with fiscal sustainability.

Building resilience is a work in progress. In the most recent assessment, the Joint External Evaluation process in 2016 identified only eight of 48 indicators for which capacity was sufficient to prevent, detect and respond to infectious disease and other public health emergencies (WHO, 2017). The strongest areas were coordination, communication and advocacy,

event-based surveillance and immunization. Areas of weakness included shortages in workforce training in public health, lack of regular exchange between the human and animal health sectors related to outbreak investigations, and gaps in planning and policy-making. The development of a national strategy to combat AMR and strengthen national laboratory microbiology testing has not yet been matched by an adequate surveillance programme for AMR. Improvements have been seen in the existing indicator-based and event-based surveillance systems for human disease, though surveillance in the animal health sector is much less developed. Many of the 94 national public laboratories at different levels of the health system (with quality management systems to monitor biosafety) are dependent on external funding. Systems for public health emergency preparedness need further development.

Sustained economic growth has been the foundation on which the fiscal space for government health spending has increased, with an anticipated further rise in the budget allocation from US\$ 292 million in 2015 to US\$ 538 million by 2020 (MoH, 2016; RGC, 2014). The MoH anticipates a reduction in the “funding gap” (to be funded by international donors) for implementation of the Health Strategic Plan 2016–2020, from US\$ 318 million in 2016 to US\$ 158 million in 2020. The MoH is committed to using evidence-based information to advocate for predictable government allocations for health as well as exploring innovative approaches to domestic resource mobilization, such as earmarked taxes and public–private partnerships.

5.5 Conclusions

The Cambodian health system is passing from an extended period of piloting and experimentation into a period of consolidation and scaling up of proven interventions. From a period when the strengthening of the supply side was the greatest need, then to recent experiences in improving access to care through demand-side financing innovations, the health system has entered a period where improved quality of care is paramount. The third Health Strategic Plan for 2016–2020 identifies two key challenges: responding to the epidemiological and demographic transition, and achieving equity in access and financing across the population. To these

might be added the likely reduction in development assistance funding, as Cambodia transitions to a lower-middle-income country.

Future policy directions involve a shift to a single-payer health fund combining through the NSSF, which requires both the consistent delivery of quality health care and more efficient management of service delivery. In the public sector this requires attention to funding, management processes and the remuneration of public sector workers. For the private sector, it poses the immediate need for extended regulation, accreditation and enforcement. The government and MoH now see moving towards UHC as the framework for the continuation of the health reform process.

The longer-term process of health reform has been guided by consistent national health planning, culminating in the adoption of consecutive Health Strategic Plans for 2003–2007, 2008–2015 and 2016–2020. Building a health service infrastructure, providing access to the poor and strengthening the delivery of government services have been at the heart of these plans. Much is left to be done even in the wake of ongoing progress. Recent health reforms have focused on strengthening the MoH's capacity to manage health-service delivery in line with the government's broader public administrative reform, which aims at improving the efficiency and effectiveness of government services. The greater capacity of government service delivery will, in the coming period, provide a firm foundation on which the MoH and government can address the wider needs for stewardship and management of the emerging mixed health system in Cambodia.

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Chapter 6. Indonesia

Yodi Mahendradhata, Tiara Marthias, Laksono Trisnantoro



6.1 Introduction

6.1.1 Economic context

Indonesia is a politically stable lower-middle-income country. It has achieved strong economic growth since the severe economic crisis in the 1990s, with a growing “fiscal space”. Table 6.1 shows how the socioeconomic indicators improved in the past two decades following expansion of the economy. The GDP per capita has risen steadily from US\$ 780 in 2000 to US\$ 3847 in 2017 (World Bank, 2018). Indonesia is the fourth-largest economy in East Asia and the 15th largest economy in the world on a purchasing power parity basis. With decreasing inflation (from 12.6% in 2001 to 4.4% in 2017), Indonesia also has a relatively low debt burden at 31.4% of its GDP (Bank Indonesia, 2018) compared to both major economies and other East Asian countries.

The Indonesian Government aims to attain a range of large infrastructure development targets by 2019 and large-scale investment (worth around US\$ 250 billion) between 2011 and 2025 (Coordinating Ministry for Economic Affairs, 2011). However, the current economic growth is still below the necessary sustainable rate of 7%–9% that is required to finance government plans and achieve the goal of becoming one of the 10 largest global economies by 2025 (OECD, 2012). Furthermore, while poverty rates have been falling steadily in both rural and urban areas, it is estimated that 25 million people still live below the poverty line or are vulnerable to falling into poverty (Priasto, 2016). From an equality point of view, the Gini coefficient has also risen, from 34.0 (2005) to 39.5 (2013) (World Bank, 2018), partly due to rapid urbanization and growing urban poverty. Macroeconomic growth has pushed Indonesia’s unemployment rate steadily downward, from 6.1% in 2000 to 4.2% in 2017 (World Bank, 2018). However, it will be a challenge for the government to stimulate job creation so that the labour market can absorb the growing labour force. Vulnerable employment (unpaid workers and self-employed workers, mainly in the informal sector) is high compared to developed countries and regional peers.

Table 6.1 Indonesia: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	147.5	181.4	211.5	242.5	258.2	264.0
Population density (people per sq.km of land area)	81.4	100.2	116.8	133.9	142.5	145.7
Fertility rate, total (births per woman)	4.4	3.1	2.5	2.5	2.4	2.4 (2016)
Birth rate, crude (per 1000 people)	33.4	25.8	21.8	20.9	19.4	19.0 (2016)
Death rate, crude (per 1000 people)	9.8	7.9	7.3	7.1	7.1	7.1 (2016)
Population growth (annual %)	2.4	1.8	1.4	1.3	1.2	1.1
Population ages 65 and above (% of total)	3.6	3.8	4.7	4.8	5.1	5.3
Age dependency ratio, old (% of working-age population)	6.5	6.3	7.3	7.3	7.6	7.9
Age dependency ratio, young (% of working-age population)	74.2	60.9	47.5	43.8	41.6	40.6
GDP (current US\$, billions)	72.5	106.1	165	755.1	860.9	1015.5
GDP per capita (current US\$)	491.4	585	780.1	3113.5	3334.5	3846.9
GDP growth (annual %)	9.9	7.2	4.9	6.2	4.9	5.1
Gross national expenditure (% of GDP)	91.7	98.3	89.5	98.1	99.6	98.8
Tax revenue (% of GDP)	21.8	19.1	..	10.5	10.8	10.3 (2016)
Central Government debt, total (% of GDP)	..	45.7	..	26.2	30.3	31.4 (2016)
Industry, value added (% of GDP)	..	39.4	42.0	42.8	40.0	39.4
Agriculture, forestry and fishing, value added (% of GDP)	..	21.5	15.7	13.9	13.5	13.1
Services, value added (% of GDP)	..	39.1	33.4	40.7	43.3	43.6
Labour force, total (in millions)	..	73.0	99.0	117.0	122.6	127.1
Unemployment, total (% of total labour force) (modelled ILO estimate)	..	..	6.1	5.6	4.5	4.2
Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)	..	58.8	39.3	15.7	7.2	5.7
Personal remittances, received (% of GDP)	..	0.2	0.7	0.9	1.1	0.9
Current health expenditure (% of GDP)	..	..	2.0	3.5	3.3	..

Key: GDP: gross domestic product; ILO: International Labour Organization; PPP: purchasing power parity

Source: World Bank, 2018

6.1.2 Political context

Indonesia is a presidential republic with a constitution and independent executive, judicial and legislative branches of government. It is a democratic country, marked by direct parliamentary and presidential elections that followed after the end of the country's authoritarian "New Order" era of former President Suharto (1965–1998). The latest 2014 parliamentary election was won by the Indonesian Democratic Party of Struggle (PDI-P), which was the main opposition party. The party's presidential candidate, Joko Widodo, subsequently won the Presidential election in the first round. In 2019, Indonesia will have another round of parliamentary and presidential elections.

Two sets of major policy processes at the national level include (1) regular development planning and budgeting, and (2) the development of ad hoc laws and regulations (Datta et al., 2011). Under a 2011 law, public consultation is set as a key element of Indonesia's regulatory framework. However, there is still a need to strengthen public participation in politics and the accountability systems of the government.

Since 1999, Indonesia has undergone a decentralization process, where large amounts of public expenditure and service delivery were transferred from the national level to provincial and district governments. The fall of the authoritarian regime and the ensuing democratization process in Indonesia led to the emergence of a discourse on good governance, accountability and transparency of public institutions. The civil society sector has grown rapidly due to the upholding of basic freedom of expression and association.

At the national level, health development efforts have been a political priority second only to the national education programme. The current government has continued to regard the health sector as one of the national interests through its *Nawacita* or the nine pillars of the national development agenda (Government of Indonesia, 2015) in which the National Health Insurance Programme was included as one of the visions.

In 2013, Indonesia stepped up its role on the global health diplomacy stage (Heibert, 2013), and held influential positions such as chairing the

Global Fund Board and co-chairing the United Nations panel that drafted the SDGs.

6.1.3 Natural and human-induced disasters

Indonesia is among the most disaster-prone countries in the world, and regularly experiences drought, flooding, volcanic eruptions, landslides and earthquakes. The islands of Sumatra and Java in particular are most at risk from multiple hazards (Djalante, 2018). High population density and rapid industrialization render Indonesia vulnerable to the likely effects of climate change (WHO, 2016a). Climate variability and climate change are already exacerbating many of the disaster risks that the country faces. The 2017 *World risk report* named Indonesia the 33rd most “at-risk” country for disaster (Bündnis Entwicklung Hilft, 2017). Other Asian nations with higher overall risk levels include the Philippines (ranked third), Bangladesh (ranked fifth), Cambodia (ranked eighth) and Timor-Leste (ranked tenth). Table 6.2 summarizes the disasters in Indonesia between 1997 and 2017.

Table 6.2 Indonesia: Natural disasters, 1997–2017

Disaster subtype	Events count	Total deaths	Total affected	Total damage ('000 US\$)
Drought	3	683	1 080 000	89 000
Ground movement	51	8657	7 405 010	6 763 280
Tsunami	6	167 052	590 684	4 506 600
Bacterial disease	3	168	1024	0
Viral disease	11	2020	131 642	0
Other epidemic	3	704	984	0
Flash flood	30	1754	1 024 837	249 200
Riverine flood	72	1713	3 904 027	5 633 433
Other flood	18	161	507 420	108 000
Landslide	40	1362	331 037	98 404
Mudslide	4	162	56 215	54 600
Rockfall	1	12	55	0
Convective storm	3	25	12 950	1000
Tropical cyclone	2	11	3350	0
Ash fall	19	368	432 520	186 000
Forest fire	8	262	444 134	10 315 800
Other volcanic activity	1	0	133 349	0

Source: Center for Research on the Epidemiology of Disasters, 2018

Driven by its geographical position on the “Ring of Fire” and location at the boundaries of three tectonic plates, natural hazards are the most prevalent threat in Indonesia (CFE-DMHA, 2015). These geographical features essentially cause very high seismicity and proliferation of active volcanoes. Human-induced hazards can occur on a very large scale in some instances and are a persistent threat, even though natural hazards are generally more widespread and devastating in Indonesia (CFE-DMHA, 2015). In fact, forest fires accounted for greater economic damage than any other type of disaster between 1997 and 2017, with US\$ 10.3 billion in direct costs (Center for Research on the Epidemiology of Disasters, 2018).

6.2 Health status and risk factors

6.2.1 Health status

Indonesia has made significant advances in recent decades in key population health indicators such as life expectancy and infant mortality, as well as considerable improvements in the general health status of the population.

Table 6.3 Indonesia: Mortality and health indicators, 1990–2016

Indicators	1990	1995	2000	2005	2010	2015	2016
Life expectancy at birth, total (years)	63.2	65.0	66.2	67.2	68.2	69.0	69.2
Life expectancy at birth, male (years)	61.9	63.5	64.6	65.2	66.1	67.0	67.2
Life expectancy at birth, female (years)	64.7	66.6	67.9	69.2	70.3	71.2	71.4
Total mortality rate, adult, male (per 1000 male adults)	216.4	211.2	213.8	217.6	213.2	205.5	203.9
Total mortality rate, adult, female (per 1000 female adults)	182.2	172.2	167.7	162.1	154.9	145.7	143.4

Source: World Bank, 2018

Ischaemic heart disease is the leading cause of premature death among Indonesians followed by stroke; these caused 17.8% and 13.8% of all deaths in 2016, respectively (Table 6.4). Common risk factors include hypertension, smoking and hypercholesterolaemia (Kusuma et al., 2009). Cancer ranked third as a cause of death in Indonesia with the most common cancers being lung, liver and colorectal cancer (Kimman et al., 2012). Among

communicable diseases, TB was the leading cause of death, causing 5.8% of all deaths in 2016.

Table 6.4 Indonesia: Main causes of death (%), 1990–2016

Causes	1990	1995	2000	2005	2010	2016
Communicable diseases	29.1	23.6	20.7	19.4	16.4	20.29
Tuberculosis	11.3	10.3	10.4	11.0	9.5	5.8
Lower respiratory infections	12.0	9.4	6.1	4.6	4.1	2.5
Diarrhoea	5.8	3.9	4.2	3.8	2.8	3.2
Non-communicable diseases	35.9	42.4	47.8	51.8	55.6	73.7
Cancer	7.5	9.1	9.9	10.4	11.3	9.58
Liver cancer	0.6	0.7	0.8	0.8	0.9	0.7
Colon cancer	0.5	0.6	0.7	0.8	0.9	0.7
Cancer of the trachea, bronchus and lung	1.2	1.6	1.8	1.9	2.1	0.9
Breast cancer	0.6	0.7	0.8	0.9	1.0	1.1
Cervical cancer	0.6	0.7	0.7	0.7	0.7	0.6
Diabetes	3.7	4.6	5.2	5.7	6.0	5.8
Ischaemic heart diseases	4.9	5.9	6.6	7.3	8.1	17.8
Stroke	12.4	14.0	16.5	18.4	19.5	13.8
Chronic respiratory diseases	3.9	4.5	4.8	4.9	5.1	3.2
External cause	3.3	4.3	4.5	4.0	4.2	2.7
Road injury	3.3	4.3	4.5	4.0	4.2	2.7

Source: Institute for Health Metrics and Evaluation, 2018

In terms of DALYs lost in 2016 (Table 6.5), the leading causes due to NCDs were ischaemic heart disease (9.0) and stroke (7.1). TB remained the leading cause of DALYs lost for communicable diseases (4.2).

Table 6.5 Indonesia: Major causes of DALYs lost, 1990–2016

Causes	% of total DALYs lost					
	1990	1995	2000	2005	2010	2016
Communicable diseases						
Tuberculosis	7.5	7.1	7.6	8.4	7.6	4.2
Lower respiratory infections	13.7	10.4	5.9	3.8	3.0	2.4
Diarrhoea	6.8	4.6	5.6	5.4	4.0	2.7
Noncommunicable diseases						
Lung cancer	0.5	0.7	0.8	0.9	1.0	0.5
Diabetes	1.7	2.2	2.6	3.0	3.4	4.6
Ischaemic heart diseases	1.9	2.4	2.8	3.3	3.8	9.0

Table 6.5 Indonesia: Major causes of DALYs lost, 1990–2016 (contd)

Causes	% of total DALYs lost					
	1990	1995	2000	2005	2010	2016
Stroke	4.3	5.0	6.2	7.3	8.0	7.1
Chronic obstructive pulmonary diseases	1.6	1.9	2.2	2.3	2.6	2.2
Low back pain	2.0	2.4	2.7	2.9	3.1	3.9
Major depressive disorder	2.3	2.7	2.9	3.0	3.2	1.3
External cause						
Road injury	3.2	4.2	4.6	4.4	4.6	3.0

Source: Institute for Health Metrics and Evaluation, 2018

The morbidity data for selected diseases (Table 6.6) show an increase in the incidence of TB, with a growing prevalence of MDR-TB (see section 6.3.5) as well as new HIV cases. There is also a marked increase in the prevalence of diabetes, with a significant jump from 3009 people living with diabetes per 100 000 population in 2011 to 10 276 per 100 000 in 2017. This is partly due to the increase in obesity and an ageing population in Indonesia (NCD Risk Factor Collaboration, 2016; Sutanegara and Budhiarta, 2000).

Table 6.6 Indonesia: Morbidity status of selected diseases, 2007–2016

Indicators	2007	2008	2009	2010	2011	2016
Incidence of tuberculosis (per 100 000 population) ^a	429	424	419	415	4107	391
Incidence of dengue (per 100 000 population) ^b	68	66	66	65	24	-
Number of lab confirmed malaria cases (per 100 000 population) ^c	69	108	80	91	98	-
Adults (age 15+) and children (age 0–14) newly infected with HIV (per 100 000 population) ^a	27.5	26.3	25.9	25.2	24.4	18.8
Number of people living with diabetes (per 100 000 population) ^d	1242	-	-	2903	3009	10 276 (2017)

Sources: ^aWorld Bank, 2018b; ^bWHO Regional Office for South-East Asia, 2011; ^cWHO, 2012; ^dInternational Diabetes Federation, 2017

Additionally, one of the most potent forces that currently traps Indonesia's poorest 111 million people in poverty and could eventually threaten Indonesia's economic potential is a group of neglected tropical diseases (NTDs) affecting the region (Tan et al., 2014). These people suffer from an extraordinary level of NTDs, led by widespread helminth infections, such as soil-transmitted helminth (STH) infections and lymphatic filariasis (LF), and neglected bacterial infections such as yaws and leptospirosis.

Moreover, Indonesia is the only country in the WHO South-East Asia Region with endemic schistosomiasis. Responding to this increasingly complex epidemiological pattern is a major challenge for the country's health system.

6.2.2 Risk factors

Table 6.7 Indonesia: Major risk factors affecting health status (DALYs), 1990–2016

Risk factors	% of total DALYs lost					
	1990	1995	2000	2005	2010	2016
Dietary risks	5.2	8.3	10.2	9.6	10.7	13.6
High blood pressure	4.8	6.0	7.4	8.9	10.0	13.4
Smoking	6.3	6.3	6.0	6.2	8.3	8.1
Household air pollution	9.7	8.2	6.4	5.9	5.9	2.5
High fasting plasma glucose	2.8	3.3	3.9	4.4	4.7	10.1

Source: Institute for Health Metrics and Evaluation, 2018

Indonesia is in the midst of an epidemiological transition in which NCDs are becoming increasingly important while infectious diseases remain a significant part of the disease burden. Globally, Indonesia ranked second among countries with the highest TB disease burden in the world (WHO, 2018b), due to a combination of a large population and a high prevalence rate (Collins, Hafidz and Suraratdecha, 2013). Indonesia remains the only country in Asia and one of 10 worldwide not to ratify the WHO FCTC, which calls for stronger regulation of the production, sale, distribution, advertisement and taxation of tobacco products. However, several FCTC policies aimed at controlling tobacco use have been implemented. These policies cover the regulation on advertising, promotion and sponsorship of tobacco products; tobacco tax and its use for health financing (sin tax); and policies for supporting no-smoking areas that is mandated to the local governments.

6.3 The health system

6.3.1 Organization and governance

The Indonesian health system has a mixture of public and private providers, and public and private financing. The public system is administered in line with the decentralized government system, with

central, provincial and district government responsibilities. The central MoH is responsible for the management of some tertiary and specialist hospitals, provision of strategic direction, setting of standards, regulation, and ensuring the availability of financial and human resources. Provincial governments are responsible for the management of provincial-level hospitals, providing technical oversight and monitoring district health services, and coordinating cross-district health issues within the province. District/municipality governments are responsible for the management of district/city hospitals, and the district public health network of community health centres (*puskemas*) and associated subdistrict facilities. There are a range of private providers, including networks of hospitals and clinics managed by not-for-profit and charitable organizations, for-profit providers, and individual doctors and midwives who engage in dual practice.

Indonesia has a hierarchy of interrelated long-term, medium-term and annual plans, from central to provincial and district level. The planning process combines top-down direction, with bottom-up participation from communities and local agencies.

While Indonesia has established a national information system (SIKNAS) that links to district-level health information systems (SIKDA), communication between the systems has been weakened by decentralization, and by multiple separate reporting systems. Vital registration is not complete, and is supplemented by regular national sample surveys.

The function of regulation is divided between the central, provincial and district governments. Regulations are arranged in a hierarchy, from laws to different levels of regulation at different levels of government. Regulation of providers includes requirements for individual providers to be registered and gain a licence to practise, while hospitals require a licence to operate and must participate in the hospital accreditation scheme. There is also a variety of regulations relating to the manufacture of pharmaceutical products, their advertising, distribution and sale. However, there remains a high rate of illegal sale of pharmaceuticals by unlicensed drug vendors and self-medication is common.

6.3.2 Patient-centredness

Decentralization allows for local involvement at both the district and municipality levels by linking *pukesmas* and associated subdistrict facilities. The process of bottom-up participation from communities in the planning of health systems can in theory also help in creating a more patient-centred health system. However, this process needs to improve, especially since the changing epidemiological landscape will demand refocusing the current health service facilities towards management of more chronic diseases rather than of acute cases.

6.3.3 Financing

Regardless of the significant increase in the past eight years, Indonesia's proportion of health spending to GDP remains below the average of LMICs, at only 3.3% of the GDP in 2015 (WHO, 2018a; World Bank, 2018). This is due to low government contribution to health fund allocation, where the public share was only 37.8% of the total health expenditure while private contribution (primarily in the form of OOP payment) was up to 62.2%. In effect, high OOP has also resulted in a significant risk of catastrophic health-care expenditure.

The Indonesian Government has increased its health budget since 2004, as a result of refocused financing to reduce the financial risk due to health-care spending, especially for the poor population. A budget increase was also stipulated in the 2004 law on health, which stated that the public budget allocation for health must be at least 5% of the total central budget and 10% of the subnational government budget. Based on that legal requirement, the Indonesian Government has managed to increase its central budget allocation for health to 5% since 2016 (Ministry of Finance, 2018). However, the share of GDP allocated to the health sector is still 3.3%, as stated above.

A national health insurance programme (*Jaminan Kesehatan Nasional* or JKN) was introduced in January 2014, which combined all existing public health insurance programmes. Premium contributions were derived from the government budget (for the poor population receiving subsidies for the premiums) and insurance members, which are pooled under a single health insurance scheme implemented by a parastatal agency BPJS-K. The JKN programme is also a major contributor to the increase in government

expenditure on health. The JKN programme is planned to cover all of the Indonesian population by 2019 with a comprehensive benefit package and minimal co-payments. Under the JKN scheme, a capitation payment system is implemented for primary health care providers while hospital-level care is reimbursed using an Indonesian version of DRG called INA-CBG (Indonesia Case Based Group). However, due to the small amount of contributions collected from non-subsidized members and high expenses of medical costs, deficits in the BPJS have been observed, amounting to US\$ 230 million in 2014 and US\$ 628 million in 2017 (Ministry of Finance, 2018). At facility and district levels, there is growing concern that the high expenses of curative care and health infrastructure to support medical care is absorbing most of the JKN funds, while allocation for public health and preventive care remains low compared to curative services. This trend will continue under the current laws on social security.

Indonesia remains challenged with a high proportion of OOP expenditure, complex funding transfer channels from the national to subnational governments, expanding insurance coverage to the informal sector and ensuring equitable access to quality health-care services across Indonesia. Furthermore, the currently weak tax collection mechanisms should also be balanced with cost-sharing payment from higher-income communities.

6.3.4 Physical and human resources

In the past two decades, Indonesia has experienced an increase in health infrastructure at both the primary and secondary levels. Inpatient beds in both public and private facilities have also increased (Table 6.8), but the bed-to-population ratio remains low and lags behind other Asia Pacific countries. In addition, there is unequal distribution of health facilities across geographical regions, resulting in inequitable access to health-care services.

Table 6.8 Indonesia: Number of beds in acute care settings, 1990–2014

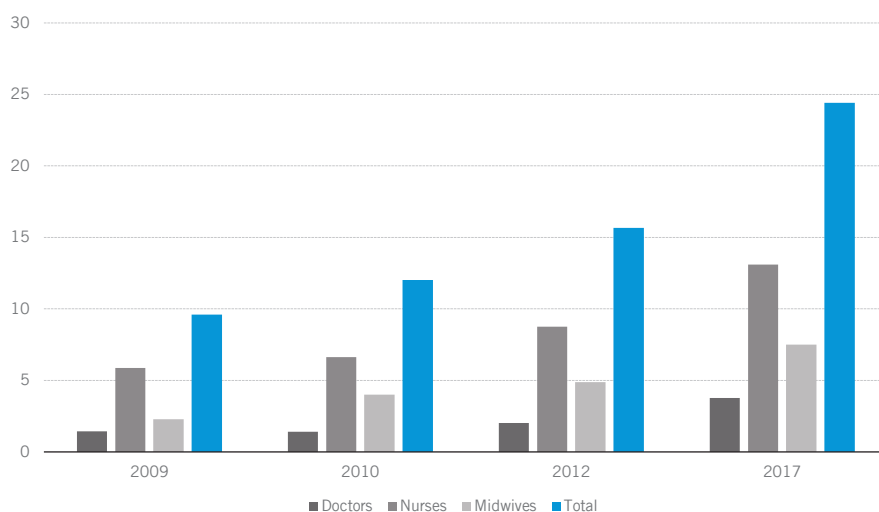
Category	1990	2000	2005	2010	2014
Hospital beds, excluding <i>puskesmas</i>	158 179	181 945	196 748	242 670	282 923
Hospital beds, including <i>puskesmas</i>	173 460	201 264	218 469	274 273	318 855
Mental hospital beds	8745	9163	9359	10 011	10 464
Total inpatient beds per 1000 population	0.97	0.96	0.97	1.14	1.26

Source: Mahendradhata et al., 2017

At the primary care level, *puskesmas* (public primary health centres) are important, particularly in the JKN context, as a gatekeeper for clinical cases as well as for public health-care services. Financing for primary care centres is mainly through the different channels of the government budget, including from the capitation fund of the JKN programme. At the secondary care level, public hospitals can now finance their own capital investment by acquiring a BLU status (*Badan Layanan Umum* or Public Service Entity) that would enable public hospitals to arrange their budget and invest revenues received from the health-care services provided. Private institutions can also be sources of funds, including from foreign investment, with the latter limited only to hospital-level investment.

Mobile technology is widely used in Indonesia; it is the eighth-largest Internet user globally. However, the use of information technology in the health sector is still limited, as seen by the limited growth in the use of electronic medical records, both at the primary and secondary levels of care.

Fig. 6.1 Indonesia: Trends in health worker density per 10 000 population, 2009–2017



Note: The recommended density of health workers (physicians, nurses and midwives) per 10 000 population is set at 44.5 (WHO, 2016b).

Source: WHO Regional Office for South-East Asia (2018)

The number of health-care workers has also been increasing in the past two decades, with a significant increase in the population-to-health-care worker ratio (Fig. 6.1). However, the physician-to-population ratio is still lower than other South-East Asian countries, with marked inequality in its geographical distribution across Indonesia. In addition, there is also a significant shortage of nurses and midwives, despite an increase in absolute numbers. At mainly the primary care level, formal health-care workers are supported by CHWs. CHWs work on a voluntary basis and are recruited based on the needs of *puskesmas*. Based on the programme or target population that they serve, there are nine main types of CHWs at the *puskesmas* level: for programmes for under-five children; the elderly; nutrition programmes; maternal, neonatal and child health (MNCH); family planning; larvae monitoring for dengue fever; occupational health; health promotion and school health. CHWs mainly assist in various health-care services including during patient registration at the *puskesmas* or *posyandu*, help in weighing and recording the weight of under-five children and infants, assist during health promotion activities and refer sick patients to health-care professionals. The professional mobility of health workers has been modest, but there has been growing outmigration of nurses to the Middle East. Health training institutions have grown in number, with various changes in the curriculum aimed to improve the quality of the graduates, but significant investment is still needed to meet the needs of the population.

6.3.5 Provision of services

Management of NCDs

As a response to the increasing burden of NCDs, a Directorate of Noncommunicable Disease was established by the MoH. Under the lead of this Directorate, NCD programmes are mainly preventive efforts, including health promotion to improve public awareness and community-based health awareness groups, early screening and detection. In addition, with the assistance of the Indonesian Cancer Foundation, the MoH established a pilot hospital-based cancer registry in Cipto Mangunkusumo, the national general hospital in Jakarta in 2005, before scaling up the project to a further 39 hospitals in Jakarta in 2006. Currently, there are 10 districts/

cities contributing to a cancer registry nationwide that covers 5–10% of the population in each district/city.

At the village level, *puskesmas* have developed community-based integrated coaching posts named *posbindu* (*posbinaanterpadu*). The *posbindu* was established before JKN and enables independent and continuous community participation in the activities of early detection, monitoring and follow up of people with NCD risk factors. This activity was developed as a form of early warning system. Specific NCD risk factors that are controlled in *posbindu* services include hypertension, coronary heart disease, diabetes, cancer, COPD, osteoporosis, gout, asthma, stroke, obesity (overweight) and kidney stones. The *posbindu* programmes can be integrated into other community activities, such as those in schools, workplaces and residences. The operational costs of *posbindu* come from national-level earmarked public funds with some funding help from local governments. The *puskesmas* refer residents who require further treatment. The MoH is facing huge challenges in ensuring the responsiveness and readiness of its public health network, especially in terms of skills and knowledge of health personnel, and availability of diagnostic equipment and medications. This highlights the need to involve the private sector not only in providing treatment but also, more importantly, in public education and early detection of NCDs.

Management of communicable diseases including emerging diseases

Communicable disease control and environmental health is led by the Communicable Disease Control Directorate along with the Directorate for Surveillance, Immunization, Quarantine, and Directorate for Environmental Health within the MoH. Implementation is jointly done with provincial health offices (PHOs) and district health offices (DHOs) (MoH, 2015).

- ***Tuberculosis control***

At the national level, TB control programmes are conducted through the National Integrated Movement for the Control of Tuberculosis (TB Gerdunas), a cross-sectoral partnership under the coordination of the Ministry of Social Welfare with the MoH as the leading technical agency. The national programme is implemented by the MoH. At the provincial

and district levels, TB Gerdunas is implemented by the PHO and DHO, respectively. TB health services, including detection and treatment, are provided by *puskesmas*, private clinics, as well as public and private hospitals (MoH, 2015).

In order to address the TB burden in Indonesia, hospital-based TB treatment was replaced with ambulatory treatment in 1972. Under this approach, the programme is mainly emphasized at the *puskesmas* level, leading to the requirement of all *puskesmas* to have at the minimum one medical doctor and TB programme staff as well as a trained laboratory technician. Although public health facilities are the backbone of Indonesia's TB programme, private clinics and hospitals also provide TB treatment, with some using the directly observed treatment, short-course (DOTS) strategy. To enhance coordination and data-sharing between the public and private sectors, TB control is supervised by a vice supervisor at the district level, who is in charge of collecting data on new cases for *puskesmas* and the private sector, and ensuring sufficient supplies of TB drugs.

Indonesia is included in the 30 high-burden countries for MDR-TB. In 2017, it was estimated that 2.8% of all new TB cases were MDR/rifampicin resistant (RR)-TB cases or 16% of previously treated TB cases. The incidence rate of MDR/RR-TB was around 12/100 000 population with 68% being MDR-TB (WHO, 2018b).

- ***HIV/AIDS control***

The National Strategy for HIV and AIDS was formulated in 1994, and guides all government sectors, local governments, NGOs, and all private and donor agencies working on HIV and AIDS programmes. The Strategy focuses on (1) prevention; (2) care, support and treatment; (3) impact-mitigation programmes; and (4) programmes to improve the enabling environment.

- ***Malaria control***

Malaria is endemic in the rural and remote parts of Indonesia. The MoH provides guidance and supervision for implementation of the malaria elimination programme to health offices in provinces/districts. Treatment

of malaria using artemisinin-based combination therapy (ACT) is provided free of charge at *puskesmas* and government hospitals.

The majority of programme funding for TB, malaria and HIV is derived from the Global Fund, which has provided support since 2002. The Global Fund has committed to providing a budget of US\$ 693 million for the eradication of these three infectious diseases in Indonesia. Thirty-five per cent of the Fund is allocated for TB, 34% for HIV/AIDS, 29% for malaria and 2% for health systems strengthening (The Global Fund, 2015).

- ***Antimicrobial resistance***

Data on AMR in Indonesia is limited and sporadic, but AMR is thought to be high and increasing. From the previous AMRIN (Antimicrobial Resistance in Indonesia: Prevalence and Prevention) study, it was found that 73% of *E. coli* from rectal samples were resistant to ampicillin, 56% to sulfamethoxazole and 22% to ciprofloxacin (Severin et al., 2010). The proportion of β -lactamase-producing bacteria was also high, and a 2005 survey in one hospital in East Java found a prevalence of extended-spectrum β -lactamases (including CTX-M) of 20% and 28% among patients with confirmed *E. coli* and *Klebsiella pneumoniae*, respectively (Lestari et al., 2008).

The challenges to AMR control in Indonesia include misuse and overuse of antibiotics in humans and livestock, which are related to high rates of self-medication and over-the-counter purchase of antibiotics. Although there is an AMR working group at the national level, there are no national action plans. The National Regulatory Authority has developed tools for quality assurance and registration of antibiotics but inspection is limited. In the animal sector, there is no policy addressing awareness of AMR in the animal husbandry sector (Parathon et al., 2017).

Management of MCH

Maternal and child mortality in Indonesia is among the highest in the region and has been improving the least compared to other important health indicators. Indonesia has made significant strides in reducing child mortality. The under-five mortality rate decreased from 52 per 1000 live

births in 2000 to 27 per 1000 live births in 2015; the IMR decreased from 41 per 1000 live births in 2000 to 23 per 1000 in 2015.

The MMR decreased from 265 per 100 000 live births in 2000 to 126 in 2015; however, this is still considerably higher than the 2015 target of 102 set by the government.

Basic childhood immunization covers hepatitis B, BCG, DPT, *Haemophilus influenzae* type b (Hib), polio and measles. In order to eliminate measles, the government aims to achieve a 95% coverage rate for measles immunization by 2020. In 2016, the national coverage was at 93% but some provinces had rates as low as 57.8% (MoH, 2016).

Regulations and guidelines for MCH services are issued by the Minister of Health, and are adapted at the provincial and district levels, including the minimum service provision related to MCH. The three main funding channels for the MCH programme are direct funding via the MoH, general budgetary transfers from the Central Government to provincial and district governments, and through national health insurance funds. There are still some vertical programmes for MCH.

Within the public sector, the patient pathway for MCH services typically commences at *puskesmas* and their networks. Patients who need MCH services are referred to district hospitals. Within the private sector, clinics serve as the primary gatekeepers of patients, including for MCH services. Under the current JKN scheme, private providers who collaborate with BPJS-Kare are also under the tiered referral system, in which they can refer MCH patients to either designated public or private hospitals. Midwives are responsible for a large portion of MCH services and are legally authorized to open private practices (MoH, 2016).

Regardless of the regulations and different efforts to optimize MCH services, the quality and adequacy of basic and comprehensive MCH services are impeded by the lack of human and physical resources, especially in areas outside Java and Bali islands. This is compounded by the low quality of MCH care that is provided by health-care facilities, including hospitals; in Java and Bali islands alone, 98% of maternal deaths occurred in a hospital setting (Anderson et al., 2014).

6.4 Performance of the health system

6.4.1 Effectiveness and quality

While anecdotally the quality of care is considered poor, there are few sources of data. The quality of ANC was measured in the Indonesian Family Life Survey (IFLS) and IFLS East surveys. As Table 6.9 demonstrates, quality scores on vignettes in both public and private services were low.

Table 6.9 Indonesia: Quality of ANC services score based on vignette responses

ANC vignette	Puskesmas		Private clinics	
	Urban	Rural	Urban	Rural
Java–Bali (2007)	34.8%	34.1%	21.4%	21.4%
Sumatra (2007)	33.8%	27.6%	21.1%	21.9%
IFLS East provinces (2012) ^a	38.9%	33.3%	20.4%	18.5%

Note: Scores are given out of 100 based on the response to specific vignettes. Higher scores indicate better quality.

Sources: Strauss et al., 2009; ^aSikoki et al., 2014

Although national routine childhood immunization coverage is good, less than 80% of *puskesmas* in the eastern provinces such as Papua, West Papua and Maluku reported the availability of the measles, DPT, polio and BCG vaccines. This shows poor service readiness for routine childhood immunization (Ministry of National Development and Planning, 2014a). Furthermore, service readiness in private clinics in the eastern provinces is also poor. Table 6.10 shows that the availability of key vaccines at private clinics in those provinces is below 10%.

Table 6.10 Indonesia: Availability of key vaccines at private clinics

Facility survey	Availability of vaccines			
	Measles	DPT	Polio	BCG
IFLS ^a	23.4%	24.8%	25.5%	22.6%
IFLS East ^b	9.7%	9.7%	9.7%	9.7%

Sources: ^aStrauss et al., 2009; ^bSikoki et al., 2014

The quality of curative services for children was also found to be low in the IFLS (Table 6.11), with private providers generally of lower quality than public providers at *puskesmas*.

Table 6.11 Indonesia: Quality of child curative services score based on vignette responses

Child health vignette	<i>Puskesmas</i>		Private clinics	
	Urban	Rural	Urban	Rural
Java–Bali (2007)	38.6%	37.8%	33.5%	34.5%
Sumatra (2007)	32.9%	35.3%	30.1%	30.9%
IFLS East provinces (2012) ^a	43.4%	38.1%	31.7%	31.9%

Note: Scores are given out of 100 based on the response to specific vignettes. Higher scores indicate better quality.

Sources: Strauss et al., 2009; ^aSikoki et al., 2014

Capacity for providing quality care for NCD management, particularly diabetes, is also limited. IFLS data showed that only 54% of all *puskesmas* were able to test blood glucose, and only 47% reported the ability to test urine. The capacity of *puskesmas* to undertake diagnostic testing also varied among urban and rural areas, and across provinces. Urban capacity was higher than rural, unsurprisingly. Again, the eastern provinces had a lower capacity compared with the western provinces. This creates a concern that where the prevalence of diabetes is high, diagnostic capacity is weak. For example, in Gorontalo and North Sulawesi, where the urban prevalence of diabetes among those above 15 years of age was estimated at around 8%, the proportion of *puskesmas* able to conduct diagnostics was reportedly less than 20%. Only in Yogyakarta and East Java provinces was there a high (more than 75%) diagnostic capacity for diabetes among *puskesmas*. The capacity of rural *puskesmas* and private providers for diagnosing and testing for diabetes to high standards was generally low (Ministry of National Development and Planning, 2014a).

The government has established policies on the quality and safety of health care. National strategies on quality and safety have been developed in a wide range of legislations and directives (Table 6.12). Additional policies have also been developed by local governments.

Table 6.12 Indonesia: Examples of policy documents on quality and safety

	Year that it came into use
Laws	
Medical practice	2004
Compulsory hospital accreditation	2009
Health Ministry regulations	
Accreditation medical laboratory	2008
Accreditation linked to licensing	2010
Hospital medical committee functions	2011
Safety of patients in hospital	2011
Medical Practice guidelines PHC	2014

Source: Ministry of National Development and Planning, 2014d

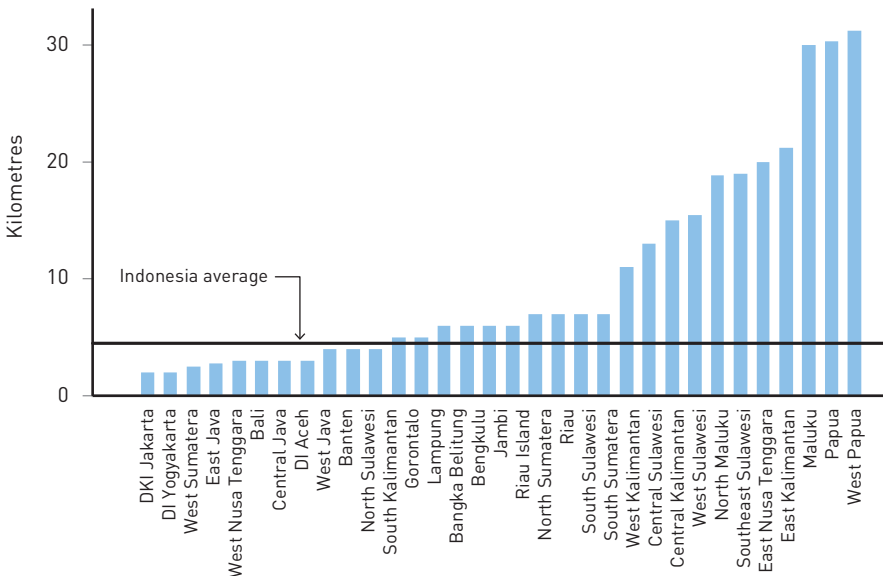
Regulations and directives relate to many dimensions of health care quality. The national hospital accreditation agency (KARS) was set up within the MoH in 1995 and re-launched in 2014 as an independent legal entity. This agency is the main vehicle for improving hospital quality and safety in Indonesia. In 2012, development of accreditation for *puskesmas* commenced within the MoH. Designated commissions for patient safety and HTA also started to operate in 2012 and 2014, respectively. In general, the government remains the main agent; however, civil society, the private sector and professional institutions are also included as partners in the formulation of policies and guidelines (Ministry of National Development and Planning, 2014a).

Although a number of regulations and directives have been developed, implementation as well as monitoring and evaluation of their impact remain weak. These legislative instruments do not clearly define roles and relationships between units, agencies, or even between national, provincial, district and facility levels. Dissemination and mapping of functions in an operational form are needed. Furthermore, accountability and reporting structures could be clarified (Ministry of National Development and Planning, 2014b).

6.4.2 Accessibility

The average distance to a health facility in Indonesia is only 5 km (National Institute of Health Research and Development, 2013). However, eastern provinces such as West Papua, Papua and Maluku have average distances of more than 30 km. This wide variation is correlated with the time ranges to reach public health facilities. While on average over 18% of Indonesians took more than one hour to reach a public hospital, over 40% of people in Maluku, West Sulawesi and West Kalimantan faced this barrier (National Institute of Health Research and Development, 2013). *Puskesmas* are more easily accessible than public hospitals. Even so, the population in several provinces in the eastern region has to travel for a long time to reach *puskesmas* (Papua 27.9%, East Nusa Tenggara 10.9% and West Kalimantan 10.9% have travel times of more than 60 minutes) (Ministry of National Development and Planning, 2014c) (Fig. 6.2).

Fig. 6.2 Indonesia: Median distance to the nearest public hospital and *puskesmas* by province, 2013



Source: Ministry of National Development and Planning, 2014c

Personal health-care access and quality in Indonesia, as measured by the Healthcare Access and Quality (HAQ) Index, improved from 37.2 in 1990 to 49.2 in 2015 (Barber et al., 2017). Among countries in South-East Asia, 2015 HAQ Index values ranged from 44.9 in Lao People's Democratic Republic to 75.5 in the Maldives. Despite overall gains in personal health-care access and quality, the gap between the highest and lowest levels increased from 1990 to 2015. The gap between Indonesia's HAQ Index versus expected frontier score for its resource level was 23.4 in 1990 and 25.2 in 2015, reflecting a widening difference between health-care access and quality, and what Indonesia could achieve given its current resources and level of development.

6.4.3 Resilience

Concerns about rising health-care expenditure and the sustainability of the national health insurance system relate to the increase in utilization of high-cost medical services, including for cardiovascular diseases, cancers and other chronic diseases. As was stated in section 6.3.3, the current JKN programme already suffers from a major deficit in funding. To maintain rational use of hospitalization and other high-cost services, it is important to strengthen promotive and preventive health services. Indonesia's recent efforts include enhancing primary care capacity through regulatory efforts and deployment of human resources for health. From the regulation perspective, it is now becoming mandatory to manage more diagnosed illnesses at the primary care level, in part to assist with cost containment of the insurance programme. However, there is a need to ensure that the medical curriculum can adapt to the higher competencies that are now required by medical professionals at the primary care level.

The ageing population will also create pressure around the capacity and financial sustainability of the health system. Although the population projections for 2030 predicts that Indonesia will continue to enjoy a "demographic dividend", there will be a rise in the elderly population, given the declining fertility rates over recent decades. Chronic conditions and other diseases requiring long-term care are increasing, demanding more investment in palliative care and also stronger preventive–promotive health services. One of the efforts to strengthen the latter is

the introduction of *posbindu*, which enables the community to participate under the coordination of *puskesmas* in the early detection of NCDs and prevention activities. From the curative care aspect, a back-referral system was introduced under the JKN system, in which patients with chronic illnesses such as hypertension and diabetes would be referred back to the primary health care system for long-term supervision and monitoring. The back-referral system also aims to reduce overutilization of hospitals for chronic diseases that can be managed at the primary care level.

6.5 Conclusions

The health system in Indonesia needs to reorient itself to the changing epidemiological landscape. The increasing burden of NCDs highlights the need to develop the capacity to deliver care for chronic conditions that require continuous long-term interaction between health providers and patients. The Central Government also needs to take into consideration the growing interregional disparity in terms of resources, services and health outcomes, and develop a comprehensive strategy to address this. With a large, widespread area and population, and with the commencement of a UHC system, the need for a reliable and integrated information system to support the planning and decision-making process is becoming even more urgent.

With the existing limitation of the public sector supply side for services, the JKN provides an opportunity for further collaboration with private health-care providers. However, there is a risk of fraud through overcharging of JKN and currently, there is no system for prevention of and prosecution for fraud. An overall accountable JKN system is needed as people need to see measures to ensure public reporting on performance and avoid corruption. Given the complexity of the health challenges in Indonesia, health financing reform is not a panacea for its health system. JKN alone will not and cannot be expected to solve the long list of health issues in the country. However, JKN provides a momentum to move towards more coordinated policies and strategies to achieve national health system goals, as well as towards a more equitable distribution of the burden of funding the system.

Thus, the government needs to take stock of this momentum to progress and make the necessary adjustments so that the health system can be more responsive to the ongoing epidemiological transition. It should function in a way that provides quality, efficient and equitable services while at the same time provides sustainable financial protection to the people. In doing so, Indonesia has the opportunity to harness the prospects of continuing economic growth and shift towards middle-income status, and the demographic dividend arising from the large proportion of a relatively young population to obtain the resources needed to invest in health. The progressive transition to a more stable and democratic government, and the development of a better aligned decentralized division of authority and responsibility, provides a basis for Indonesia to build the governance, regulatory and oversight systems to ensure that investments benefit the whole community, and reduce wastage and inefficiency.

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Chapter 7. Japan

Haruka Sakamoto, Cyrus Ghaznavi, Kenji Shibuya



7.1 Introduction

Japan, the world's third-largest economy, with a correspondingly high standard of living, level of development, safety and stability, has had great success in improving population health outcomes, such as boasting of the highest life expectancy in the world. However, the country faces many challenges, including an ageing population with a low fertility rate, a shrinking economy, and an increasing burden from NCDs and degenerative diseases, such as dementia, which all impose a considerable stress on the current health and long-term care systems in Japan.

7.1.1 Economic context

Japan is an archipelago set between the Sea of Japan to the west and the Pacific Ocean to the east, consisting of more than 6000 islands. The majority of its population inhabit the four major islands, which are divided into 47 prefectures. These are further divided into approximately 1700 cities, towns and villages. Japan's total population stands at 126 million in 2018, though it has been constantly declining since 2011. The proportion of the population aged 65 years and above reached 27.3% in 2016, which together with a low fertility rate and strict immigration policy, makes Japan one of the "oldest" countries in the world.

Japan is the world's third-largest economy in terms of total GDP. However, although Japan's GDP increased rapidly in the period immediately after the Second World War, the economic crisis of the 1990s caused several decades of stagnation and recession. The recession, along with more recent stagnation in GDP growth rate and an ageing population has meant that the Gini coefficient reached 0.33 in 2012, higher than the OECD average of 0.318. Moreover, although the unemployment rate was low at 3.4% in 2015, the number of part-time and contingent workers has been increasing in recent years. The majority of them are the elderly and post-childrearing women. The inequality in working conditions and low wages among this population pose a serious labour issue.

Table 7.1 Japan: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	116.8	123.5	126.8	128.1	127.1	126.8
Population density (people per sq.km of land area)	318.8	338.8	348	351.3	348.8	347.8
Fertility rate, total (births per woman)	1.8	1.5	1.4	1.4	1.5	1.44 (2016)
Birth rate, crude (per 1000 people)	13.5	10.0	9.4	8.5	8.0	7.8 (2016)
Death rate, crude (per 1000 people)	6.1	6.7	7.7	9.5	10.3	10.5 (2016)
Population growth (annual %)	0.8	0.3	0.2	0	-0.1	-0.2
Population ages 65 and above (% of total)	8.9	11.9	17.0	22.5	26.0	27.0
Age dependency ratio, old (% of working-age population)	13.2	17.0	24.9	35.1	42.7	45.0
Age dependency ratio, young (% of working-age population)	34.9	26.5	21.7	20.8	21.3	21.5
GDP (current US\$, billions)	1105.4	3132.8	4887.5	5700.1	4395	4872.1
GDP per capita (current US\$)	9465.4	25 359.3	38 532	44 507.7	34 567.7	38 428.1
GDP growth (annual %)	2.8	4.9	2.8	4.2	1.4	1.7
Gross national expenditure (% of GDP)	101.0	99.2	98.6	98.5	100.4	99.0 (2016)
Tax revenue (% of GDP)	10.5	12.9	10.4	8.8	11.4	11.1 (2016)
Central Government debt, total (% of GDP)	..	52.9	100.5	162.3	197	195.5 (2016)
Industry, value added (% of GDP)	..	..	32.8	28.4	28.9	29.3 (2016)
Agriculture, forestry and fishing, value added (% of GDP)	..	..	1.5	1.1	1.1	1.2 (2016)
Services, value added (% of GDP)	..	..	65.9	70.2	69.1	68.8 (2016)
Labour force, total (in millions) ^a	56.5	63.9	67.7	66.7	66.4	66.5
Unemployment, total (% of total labour force) (modelled ILO estimate) ^a	2.0	2.1	4.7	5.1	3.3	2.8
Income inequality (Gini coefficient) ^b	0.318 (1981)	0.364	0.381 (1999)	0.379 (2011)	0.376 (2014)	..
Current health expenditure (% of GDP)	..	..	7.2	9.2	10.9	..

Key: GDP: gross domestic product; ILO: International Labour Organization

Note: The Gini coefficient is a measure of income inequality; higher figures indicate greater inequality among the population (the Survey of the Redistribution of Income is conducted once in three years).

Sources: World Bank, 2018a; ^aStatistics Bureau, Ministry of Internal Affairs and Communications, 2017; ^bMinistry of Health, Labour and Welfare (MHLW), 2017a

7.1.2 Political context

The Liberal Democratic Party of Japan (LDP) has been the major party since 1955 (except in 1993 and between 2009 and 2012), so most of Japan's health-care systems have been created and managed under the LDP administration. Since the Second World War, political conflict between the major parties resulted in the expansion of health service coverage to more vulnerable groups, as the LDP attempted to weaken the socialist and communist party. Nobusuke Kishi of the LDP, then prime minister, strongly believed that attaining an equitable health-care and welfare system could be the driving force in making his administration sustainable and declared that Japan had officially achieved universal health insurance coverage in 1961. Since then, together with the pressure from the socialist party, the ruling LDP expanded the breadth and depth of universal insurance coverage (which in turn caused a constant increase in health-care expenditure).

In the early 1980s, at a time when global leaders were promoting austere fiscal policy, also known as "small government", the then prime minister, Yasuhiro Nakasone from the LDP also started an austere fiscal policy on health care in Japan. This was the turning point at which the government began to contain the health-care budget primarily through introducing a fee-control schedule (details of the fee-control schedule are explained later).

In 2001, Junichiro Koizumi of the LDP was elected as prime minister. He had a strong preference for "small government" and minimum government subsidy for social welfare. Although there was strong opposition from the Japan Medical Association (JMA) (mainly directed at the strong, austere fiscal policy on health care and the increase in both OOP expenditures and insurance premiums), Koizumi initiated the largest-ever cut in health-care budget in Japan's history, which inevitably put a strain on the health-care setting and created a "health-care crisis". Since then, how to balance cost and quality of health care remains a central debate in Japan.

Historically, both the Ministries of Health, Labour and Welfare, and the Ministry of Finance had strong influence over the health policy making process. Since 2016, the current Prime Minister, Shinzo Abe changed this process drastically as he believes that health care is the Japan's main

industry. Consequently, along with the Ministry of Economy, Trade and Industry, the cabinet office now leads many of health care policies in Japan.

7.1.3 Natural and human-induced disasters

Japan's geographical proximity to the Pacific Rim makes the country particularly prone to seismic activity, earthquakes, tsunamis and typhoons originating from the Pacific Ocean. Thus, disaster has been a major threat to population health, both in terms of acute response and long-term recovery phases. Of particular note, the devastating magnitude 9.0 Great East Japan Earthquake in 2011 killed more than 16 000 people and, coupled with the subsequent tsunami and Fukushima Daiichi nuclear power plant accident, this triple disaster caused massive destruction of local health-care and long-term care facilities. However, despite the damage to infrastructure, people in many affected areas have had continued access to quality health care under the universal health insurance system, in part due to introduction of temporary exemptions for OOP payments (Tanihara, Tomio and Kobayashi, 2013). While there is growing evidence that major disasters contribute to the development of CVDs, several studies from the area most seriously affected by the triple disaster showed only slight or no obvious increase in the risk of CVDs post-disaster (Toda et al., 2017). These experiences suggest that a strong universal health-care system supports robustness and resilience during public health emergencies in Japan.

As to the Fukushima Daiichi Nuclear Power Plant Accident, health threats have arisen in radiation-contaminated areas, and the cumulative dose from external and internal radiation exposure was a major public concern (Brumfiel and Cyranoski, 2011). Contrary to this belief, as a result of the natural weathering process and the success of strict control of food contamination, dosage levels attributed to the incident have been low enough such that the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and WHO concluded that the predicted risk of lifetime cancer is very low in the general population, except the most exposed infants and children.

7.2 Health status and risk factors

7.2.1 Health status

Life expectancy and healthy life expectancy in Japan were 79.9 years for men and 86.3 years for women, and 71.5 years for men and 76.3 years for women, respectively, in 2015; both statistics represented the highest in the world (Nomura et al., 2017). The top causes of death in 2005 and 2015 are shown in Table 7.2. Like many other high-income countries, according to the GBD study, NCDs are the leading cause of mortality and morbidity in Japan, while the burden of communicable diseases has decreased substantially over the past five decades. In 2015, the top three leading causes of death were cerebrovascular disease, ischaemic heart disease and lower respiratory tract infection. Though age-standardized rates of these diseases have shown a substantial decrease since 1990, the pace of decline in mortality has levelled off since 2005.

Table 7.2 Japan: Causes of death, both sexes, 2005 and 2015

Leading causes in 2005	Leading causes in 2015	Change in age-standardized death rate (%), 2005–2015
1 Cerebrovascular disease	1 Cerebrovascular disease	-19.3
2 Ischaemic heart disease	2 Ischaemic heart disease	-11.6
3 Lower respiratory infection	3 Lower respiratory infection	-6.5
4 Alzheimer's disease	4 Alzheimer's disease	3.7
5 Lung cancer	5 Lung cancer	-8.7
6 Stomach cancer	6 Stomach cancer	-5.9
7 Colorectal cancer	7 Colorectal cancer	-6.4
8 Liver cancer	8 Chronic kidney disease	-11.2
9 Self-harm	9 Liver cancer	4.1
10 Chronic kidney disease	10 COPD	-16.0
11 COPD	11 Pancreatic cancer	6.5
12 Pancreatic cancer	12 Self-harm	-2.3
13 Gallbladder cancer	13 Gallbladder cancer	5.1
14 Aortic aneurysm	14 Aortic aneurysm	2.1
15 Oesophageal cancer	15 Other cardiovascular disease	-8.7
16 Breast cancer	16 Interstitial lung disease	0.7
17 Other cardiovascular disease	17 Breast cancer	0.0
18 Cirrhosis hepatitis C	18 Oesophageal cancer	-14.4
19 Road injuries	19 Lymphoma	-6.6
20 Interstitial lung disease	20 Other neoplasms	-18.8

Key: COPD: chronic obstructive pulmonary disease; CVD: cardiovascular disease

Note: The ranking is based on the number of deaths from each cause

Source: Nomura et al., 2017

Because of prolonged life expectancy, the Japanese population now suffers from more chronic and age-related morbidity. Tables 7.3 and Fig. 7.1 show the causes of DALYs – a summary indicator of population health that combines mortality and morbidity – in 2015 in Japan. DALYs express equivalent years of healthy life lost due to states of poor health or disability, which explains the current status of population health in general rather than just in terms of mortality. Notably, a significant increase can be seen in Alzheimer disease, with an almost 50% increase in DALYs since 2005.

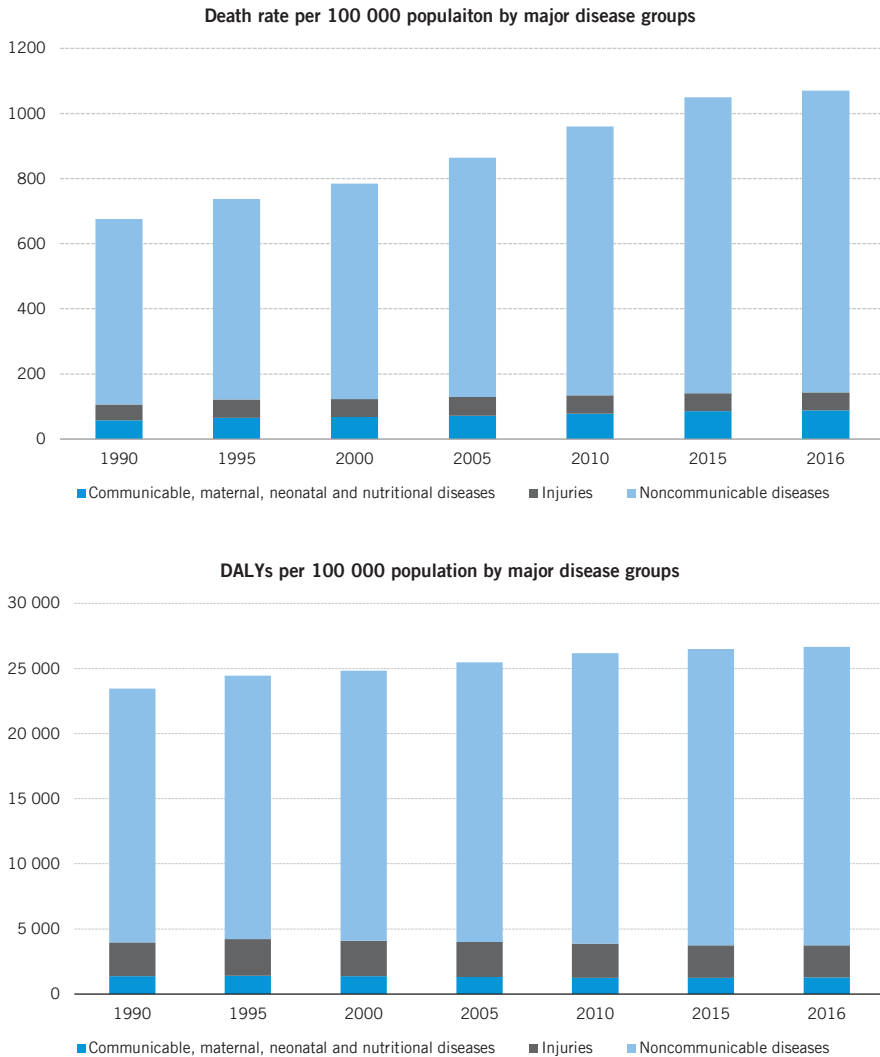
Table 7.3 Japan: Top ten causes of DALYs in 2015 and % change compared to 2005

Rank in 2015	Cause	Changes in number of DALYs (%), 2005–2015	Changes in age-standardized DALY rate (%), 2005–2015
1	Ischaemic heart disease	7.6	-14.5
2	Lower-back and neck pain	6.7	-0.1
3	Sense organ diseases	22.7	0.8
4	Cerebrovascular disease	-0.7	-21.4
5	Alzheimer's disease	49.6	3.3
6	Lower-respiratory infections	22.4	-10.8
7	Lung cancer	8.0	-11.1
8	Self-harm	-8.8	-5.3
9	Stomach cancer	-4.5	-20.6
10	Colorectal cancer	11.4	-6.4

Note: The ranking is based on the number of disability-adjusted life years (DALYs) from each cause

Source: Nomura et al., 2017

Fig. 7.1 Japan: Deaths and DALYs per 100 000 population by major disease groups, 1990–2016



Source: Institute for Health Metrics and Evaluation, 2018

Regional disparities are a growing concern. Among the 47 prefectures, the gaps between the highest and the lowest life expectancy have increased from 2.5 years in 1990 to 3.1 years in 2015; similarly, the gaps have

expanded from 2.3 years to 2.7 years for healthy life expectancy during the same period (Nomura et al., 2017). Little is known about the possible causes of regional disparities. Nomura et al. reported that there were no significant correlations between the age-standardized mortality or DALYs in 2015 and per capita health expenditure and health workforce density. Moreover, known risk factors (such as behavioural risk factors) were also uniformly distributed across prefectures. These disparities may be attributed to socioeconomic factors to some degree; however, further research is needed.

7.2.2 Risk factors

According to the GBD study, 47.1% of total deaths in 2015 were attributable to the following: behavioural risk factors accounted for 33.7% of total deaths, metabolic risks factors for 24.5%, and environmental and occupational risks factors for 6.7%.

While the Japanese population has been enjoying one of the highest life expectancies in the world, the pace of decline in mortality has levelled off since 2005. Moreover, there is an urgent need to reduce the gap between life expectancy and healthy life expectancy, and measures are required to reduce most of the attributable risk factors for both deaths and DALYs. As most risk factors linked to deaths/DALYs are modifiable, a comprehensive package of preventive measures, including a healthy lifestyle, diets and increasing coverage with antihypertensive drugs should be encouraged to ameliorate the effect of these risk factors.

Tobacco

The prevalence of smoking in the Japanese male population has dropped from 53.1% in 1990 to 31.7% in 2016, while the rates among women were almost same from 9.4% in 1990 to 9.0% in 2016 (MHLW, 2016a). However, Japan has made limited progress in reducing tobacco consumption over the past few decades compared to other OECD countries. Looking ahead to the 2020 Olympic and Paralympic games in Tokyo, there has been a movement to regulate second-hand smoke in bars and restaurants (currently there is no restriction on second-hand smoke in these venues), but the LDP is strongly opposed to such policies. This opposition is at least in part due to Japan Tobacco – the world’s third-largest tobacco company, which has

been a strong lobby on tobacco control policies in Japan. Japan Tobacco's strong connection with the government (i.e. the Minister of Finance is Japan Tobacco's biggest stockholder) makes it difficult to promote tobacco control measures in Japan.

Diabetes and hypertension

Diabetes and hypertension are the two major metabolic risk factors in Japan. The age-standardized prevalence of diabetes was 12.1% (16.3% for men and 9.3% for women) in 2016, which has been relatively stable in past decades (MHLW, 2016a). The prevalence of hypertension was 34.6% for men and 24.8% for women in 2016 (MHLW, 2016a). Salt intake is a major known cause for hypertension and, as such, lowering sodium intake has been strongly recommended. Thanks to public health programmes to promote reduction in salt intake over the past decades, the prevalence of hypertension has decreased since the 1980s. However, from 2000 onwards, there has been an increasing trend in the prevalence of hypertension among men aged 50–59 and 70–79 years; thus, further monitoring is needed for these age groups.

Body mass index (BMI)

The prevalence of obesity (BMI of 30 kg/m² or more) and overweight (BMI of 25 kg/m² or more) were only 4.5% for men and 3.3% for women in 2013, and 31.1% for men and 19.0% for women in 2016, respectively (MHLW, 2016a). The prevalence of overweight has been constant among women, while that among men has shown a constant increase from 11.9% in 1980 to 31.1% in 2016 (MHLW, 2016a). These prevalence rates are still much lower than those for other developed countries. In fact, BMIs among women of reproductive age in Japan tend to be low enough to be a cause for concern.

In conclusion, like many other developed countries, NCDs are major causes of death in Japan. Although Japan has attained favourable health outcomes such as the longest life expectancy in the world, the pace of improvement has slowed since 2005. As most risk factors linked to deaths/DALYs are modifiable, further scaling up of primary prevention and changes in lifestyle are needed.

7.3 The health system

Japan's health-care system is characterized by the universal insurance scheme, where participants are free to choose health-care facilities and access high-quality care at a relatively low price. Medical care is provided at primary, secondary and tertiary health-care facilities, while public health services are provided at regional public health centres or community health centres.

7.3.1 Organization

The Ministry of Health, Labour and Welfare (MHLW) is the central leading organization in the Japanese health-care system. The MHLW actively collaborates and cooperates with various other bodies such as the Cabinet, Ministry of Finance, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Agriculture, Forestry and Fisheries, Ministry of Economy, Trade and Industry, Japan Medical Association and Japanese Nursing Association.

Fig. 7.2 Japan: Organization chart of the Ministry of Health, Labour and Welfare



Source: MHLW, 2017b

Decentralization

Across the 47 prefectures in Japan, there are a total of 1718 municipalities (cities, towns and villages). Based on the regional context, each prefecture is required to create detailed “medical care plans”, which aim to establish a system that provides necessary health-care services for local residents seamlessly from the acute phase to the long-term phase. Although prefectural governors are authorized to develop a medical care plan (MCP), it is commonly discussed in committees composed of representatives from local medical and dental associations, hospitals and relevant stakeholders.

Under the Community Health Act of 1947, all prefectures and high-population municipalities (population above 500 000) are required to establish a regional public health centre, which provides and coordinates a wide range of public health services, including care for mental disorders, rare diseases, communicable diseases and food poisoning. In addition, all municipalities, irrespective of their size, are also required to establish a community health centre which, in line with MHLW regulations and using the MCP framework, is in charge of community-based activities, including health promotion activities such as ANC clinics, immunization, health check-ups, counselling and screening for cancer.

7.3.2 Patient-centredness

Article 25 of the Japanese Constitution fundamentally supports patient rights in Japan by stating that “all people shall have the right to maintain the minimum standards of wholesome and cultured living. In all spheres of life, the State shall use its endeavours for the promotion and extension of social welfare and security, and of public health.” Article 25 of the Constitution is the foundation of all health-care policies in Japan.

Patient organizations play a predominant role in patient advocacy. It is estimated that there are more than 3000 patient organizations in Japan, and they can participate as committee members during policy-setting meetings conducted by the MHLW. However, these patient organizations are relatively small and fragmented compared with those in the USA and the EU, which means that only a few patient organizations have significant clout over the policy-making process.

7.3.3 Financing

Earlier, Japan's health-care system was characterized as having a good quality of health-care services at a relatively low cost. However, mainly due to advanced technologies, the increasing prices of medicines and an ageing society, the current health expenditure has been climbing and is now ranked as the third highest among OECD countries. In 2017, approximately one third of the national budget was allocated to social security (health-care, pension, long-term care and welfare) (Ministry of Finance, 2017). The per capita health expenditure in Japan was US\$ 4435.6 in 2015, which was slightly higher than the OECD average of US\$ 4003.0 (OECD, 2018a). Table 7.4 shows the trends in health-care expenditure in Japan between 2000 and 2014: health expenditures paid by the public sector in Japan have been 80–85%, consistently sitting higher than the OECD average at around 70–75%, while OOP payments have been constantly low at around 14%.

Table 7.4 Japan: Trends in health-care expenditure, 2000–2014

Expenditure	2000	2005	2010	2014
Current health expenditure(% GDP)	7	8	9	11
Compulsory financing arrangement (% of CHE)	80	81	82	84
Voluntary financing arrangements(% of CHE)	20	19	18	16
Out-of-pocket payments (% of THE)	16	16	15	13

Key: GDP: gross domestic product; CHE: current health expenditure; THE: total health expenditure

Source: World Health Organization, 2018

Japan's health-care system is based on a social insurance system with tax subsidies and some amount of OOP payment, and it covers 100% of the population. All residents of Japan are required by law to enrol in a health insurance programme. For age 0–74 years, there are two main types of health insurance schemes in Japan – Employees' Health Insurance and National Health Insurance (NHI). Employees' Health Insurance covers government officials, employed workers and their dependents, while the NHI is designed for self-employed and unemployed people and is run by the municipal government (i.e. cities, towns and villages). Employees' Health Insurance is further divided into four major categories: Japan Health

Insurance Association (JHIA), Society-Managed Health Insurance (SMHI), Mutual Aid Societies (MAS) and Seaman’s insurance. Those who are above 75 years of age are covered with the late-stage medical care for the elderly, which will be explained later this section.

Table 7.5 Japan: Summary of health insurance schemes

Name of insurance scheme	Target population	Number of insurers	Population coverage (%) [*]
National Health Insurance	Self-employed	1716 municipal governments,	28.3
	Unemployed	164 NHI societies**	
	Elderly		
Employees’ health insurance			58.7
1 JHIA	Small- and medium- size companies	1	28.7
2 SMHI	Large-size companies	1409	23.0
3 MAS	Public servants	85	7.0
4 Seamen’s insurance	Seamen	1	0.1
Late-stage medical care for the elderly	Elderly over 75 years of age	1716 municipal governments	13

Key: JHIA: Japan Health Insurance Association; SMHI: Society-Managed Health Insurance; MAS: Mutual Aid Societies

Notes: *Those who are aged 75 years and above are covered with an independent insurance scheme (called the late-stage medical care system for the elderly), and thus the sum of NHI and Employees’ Health Insurance is not 100%. ** In general, insurers of the NHI are the municipal government; however, some NHIs have grouped to create NHI societies to have a larger financial pool, and is now accounted for 164 societies.

Source: MHLW, 2016b

As shown in Table 7.5, Japan’s health insurance system does not have a single pool, but rather insurers are divided into approximately 3000 organizations. Financial disparities between the NHI and Employees’ Health Insurance have been of major concern in recent decades. In particular, with urbanization and an ageing society, the size of risk pools in the NHI has changed significantly and now many smaller municipalities face declining funding and increasing health expenditures. Moreover, although there are several cross-subsidy mechanisms among various insurance schemes, premium rates largely differ across municipalities. This fragmented insurer system remains a source of systemic inefficiency and premium inequities.

For OOP payments, the rate is set as follows: pre-elementary school² = 20% of total health-care cost; elementary school up to age 69 years = 30%; age 70–75 years = 20%; and age 75 years or above = 10%. Although the OOP payment rate of 30% for elementary school up to age 69 years is relatively high by international standards, there is a monthly and annual cap on OOP payments for individuals and households. Patients are required to pay 30% of health-care costs up to the cap every calendar month, but are required to pay only the cap amount plus 1% of total health-care costs if the cap is exceeded. The monthly cap for the household is set between US\$ 312 and US\$ 2228, based on income. Thanks to this cap payment system, the OOP payment as a percentage of THE in Japan has remained around 14%, which is constantly lower than the OECD average.

Late-stage medical care system for the elderly

To reduce the disparities between the NHI and Employees' Health Insurance, the government introduced a late-stage medical care system for the elderly in 2008, which separated the elderly aged 75 years and above from the exiting health insurance system. The late-stage elderly contribute premiums of approximately 10% of total expenditure, which is deducted from their pensions. The remaining funds for the late-stage medical care system for the elderly is financed by government subsidies (50%) and contributions by the working population (40%).

Another unique trait of the Japanese health financing system is the uniform fee schedule, where all prices for health-care procedures, medical devices and pharmaceuticals are determined by the MHLW and are covered under the national insurance system. Once every two years, the MHLW reviews the scope of coverage by the national insurance scheme and the reimbursement billing conditions for procedures, drugs and medical devices. All hospitals and clinics, including private care facilities, are required to comply with the nationally uniform fee schedule set by the MHLW.

² Elementary school in Japan starts at 6 years of age.

7.3.4 Physical and human resources

In Japan, there were 8442 hospitals, 101 529 clinics and 68 940 dental clinics in 2016 (MHLW, 2016c). Among them, privately owned hospitals numbered 6849 (81.1%), of which 5754 (68.2%) are owned by non-profit medical corporations, 240 (2.8%) solely owned by private individuals, and 855 (10.1%) owned by others, including non-profit public corporations, non-profit school corporations and private medical schools. Although privately owned, they are strictly regulated by the Central Government in terms of price-setting and provision of services (i.e. the prices of health-care procedures are set under the uniform fee schedule). The remaining 1593 hospitals are government- or prefecture-owned hospitals.

Compared with other OECD countries, inpatient care in Japan is characterized by longer-than-average hospital stays, with a larger number of inpatient beds per capita. Although the government has promoted a decrease in the total number of inpatient beds, Japan still had 13.2 hospital beds per 1000 population in 2015, which was significantly higher than the OECD average of 4.9 beds per 1000 persons (OECD, 2016). The average length of hospital stay in Japan for acute care was 16.5 days in 2015, which was also longer than the OECD average of 6.8 days (OECD, 2018b). Japanese hospitals are generally well equipped with high-technology devices, such as computed tomography (CT) and magnetic resonance imaging (MRI) scanners. The number of CT scanners per 1000 population is 0.101, compared with a mean of 0.024 in other OECD countries. The number of MRI scanners per 1000 population is 0.047, which is also higher than that of the OECD average of 0.014.

In 2014, Japan had a relatively small number of physicians (2.35 per 1000 persons) but more nurses (9.06 per 1000 persons) when compared to other OECD countries (OECD average density is 3.02 and 8.03, respectively) (OECD, 2016). Like other countries, the uneven distribution of the health workforce in terms of specialty (especially for physicians) and locations, inadequate training system, and task-shifting is a major concern.

7.3.5 Provision of services

The Japanese health-care system does not necessarily distinguish between primary and secondary care, and there is no gate-keeper system. Historically, Japan did not have a general practitioner system, and most physicians chose a specialty without any national accreditation (i.e. physicians could freely profess their specialty to be internal medicine, surgery, paediatrics, etc.). Patients often go to secondary health-care facilities even with mild symptoms, and secondary health-care services are accessed directly at an affordable cost (set at a standard rate regardless of specialty, location, public/private facilities under the fee schedule) without the need for a referral from a primary health-care facility. These secondary services can be provided locally at small clinics or treatment centres, or at outpatient departments of larger hospitals that would be considered tertiary-care centres in a gate-keeping system.

Although hospital outpatient services are available without a referral, the government introduced a referral system for the use of tertiary-care services through clinic services. Patients without referral letters from primary care clinics are now required to pay at least US\$ 50 at the reception of large hospitals, such as university hospitals. However, the difference between primary and secondary health-care facilities remain vague. Some community-based clinics are often equipped with advanced technologies such as MRI machines, enabling the provision of hospital-level services at local clinics.

Management of NCDs

The Health Promotion Act was promulgated in 2002, requiring prefectural and municipal governments to develop health promotional plans and governments at all levels to monitor NCDs for effective health promotion (Ezoe et al., 2017). Under this Act, the MHLW promoted the “National Health Promotion Movement in the 21st century” (abbreviated as “Health Japan 21”) as a goal-oriented health promotion measure for the prevention of NCDs (Sakurai, 2003). The fundamental goals of “Health Japan 21” are:

- to improve healthy life expectancy and reduce health inequalities;

- to prevent the onset and progression of NCDs;
- to maintain and improve functions necessary for a healthy social life;
- to create a social environment in which individual health is protected and healthy behaviours are supported; and
- to improve lifestyle-related factors affecting health, such as nutrition, physical activity and other risk factors.

As part of preventive measures against NCDs, three types of health check-ups target the general population in Japan: (i) general health check-ups; (ii) specific health check-ups and specific health guidance (SHCSHG); and (iii) cancer screening. All employers are required by the Industry Safety and Health Act to provide general health check-ups to all employees at the time of contract as well as once every year. It includes (i) past medical history and occupation; (ii) subjective and objective symptoms; (iii) height, weight, vision and hearing; (iv) chest X-ray; (v) blood pressure; (vi) anaemia (complete blood count); (vii) liver function; (viii) cholesterol; (ix) diabetes mellitus; (x) urine analysis; and (xi) ECG. All costs are paid by the employers; individual workers do not pay for check-ups.

In addition to general health check-ups, the MHLW introduced in 2008 a nationwide screening programme for NCDs, called SHCSHG. Under this programme, all insurers are mandated to conduct SHCSHG for enrollees aged 40–74 years. This programme expands on general health check-ups to include a wider range of items and, based on the results, specific health guidance is offered to the participants identified as having risk factors for NCDs. All costs are covered by insurers; individuals are not required to pay for SHCSHG.

In 1983, the Japanese Government started to subsidize stomach and uterine cancer screening, followed by screening for lung, colon and breast cancer. At that time, no other country provided publicly funded cancer screening. However, compared with other developed countries, the screening rates in 2013 remained low at 45.8%, 41.4% and 47.5% for stomach, colon and lung cancer screening for men, respectively (National Cancer Center, 2017; Tsuji, 2009).

Management of communicable diseases, including emerging diseases

The Infectious Disease Surveillance Center (IDSC) was established under the National Institute of Infectious Disease (NIID) with the purpose of surveilling all targeted infectious diseases, which are divided into five categories according to the urgency of notification and severity. Based on the Infectious Disease Control Law of 1995, the IDSC conducts nationwide surveillance of infectious diseases and, according to disease category, collects data on the detection of infectious disease both/either from prefectural public health institutions and/or sentinel clinics and hospitals across Japan.

Under the Preventative Immunization Law, Japan started routine immunization services in 1948. The vaccine schedule was periodically revised and the country now maintains a childhood vaccination programme that is broadly consistent with the WHO-recommended vaccination schedule. The routine immunization for children includes bacillus Calmette-Guerin (BCG), measles-rubella (MR), varicella, hepatitis B, DPT-IPV (diphtheria-tetanus-pertussis and inactivated polio vaccine), Japanese encephalitis, pneumococcal, *Haemophilus influenzae* type b (Hib) and human papillomavirus (HPV). In addition, influenza vaccine is also provided to the elderly and at-risk populations. The entire cost of all the aforementioned vaccinations is covered by tax subsidies.

Management of MCH

There were approximately 1 000 000 births in Japan in 2015. The IMR was 2.0 per 1000 live births while the MMR was 5.0 per 100 000 live births in 2015, both of which are among the lowest in the world (World Bank, 2018b).

The Maternal and Child Health Act, 1965 entitles babies to free, publicly funded preventive health services, including access to the MCH Handbook (growth notes and medical records from during the pregnancy until 6 years of age), continued guidance and consultation with public health nurses for all newborn babies (additionally, extensive counselling is provided for underweight babies less than 2500 g), multiple births, single-mother households, and cases of suspected of child abuse, mass screening for congenital metabolic diseases, and routine immunizations. Newborns are

also entitled to well-baby check-ups three times within the first 3 years of life (3–4 months, 18 months and 3 years of age), which are provided at no cost by the municipal government. Moreover, most municipalities provide free additional health check-ups for infants and children up to five times.

The “Healthy parents and children” scheme was launched in 2001 and has started its second iteration in 2015. The scheme aims to improve health standards of mothers and children and set specific targets and indicators. Most MCH projects conducted both by the central and local governments are in line with the “Healthy parents and children” scheme. Areas of priority include: (i) seamless provision of public health measures for pregnant women and infants; (ii) public health measures for school-age children, from adolescence to adulthood; and (iii) development of a community that is supportive to children and their family members. Currently, particular countermeasures against child abuse are being taken. The number of cases of child abuse has increased from 11 631 in 1999 to 88 931 in 2014. As of April 2017, 210 child welfare offices were in charge of prevention of and response to child abuse. In 2007, each municipal government was required to set up a regional council for children requiring aid, with the goal of early detection and response to cases of potential child abuse. Although several countermeasures have been introduced, the number of child abuse cases has continued to increase and further efforts are needed.

7.4 Performance of the health system

7.4.1 Effectiveness and quality

Empirical evidence is scarce regarding the quality of primary health-care services in Japan. Hashimoto et al. (2011) showed that, compared to the USA, effective coverage for control of hypertension and hyperlipidaemia was much less in Japan. Using an administrative dataset, Tanaka et al. (2016) also reported that clinical practices for control of diabetes, including screening for complications of diabetes, are of relatively poor quality in Japan compared to those of the USA and European countries. These concerns might be attributable to relatively low rates of compliance to guidelines, limited opportunities for training in general practice, and the

division between preventive and curative services in Japan (Hashimoto et al., 2011).

According to the OECD Health Statistics 2015, the quality of acute care services in hospitals in Japan showed poor performance for acute myocardial infarction (AMI). The death rate due to AMI in Japan was 12%, compared with the OECD average of 8.0%. However, according to the national databases that cover around 90% of acute care hospitals in Japan, the in-hospital mortality rate due to AMI was around 7.2%, suggesting that databases need to be refined for cross-country comparisons (Sakamoto et al., 2018).

Moreover, evaluation of performance is still limited for outpatient services and chronic-care inpatient services. These data are covered mainly by the national database, which was primarily intended to facilitate reimbursements under the unified fee control schedule. As this database was not intended for research purposes, crucial data needed to determine service efficacy are often missing.

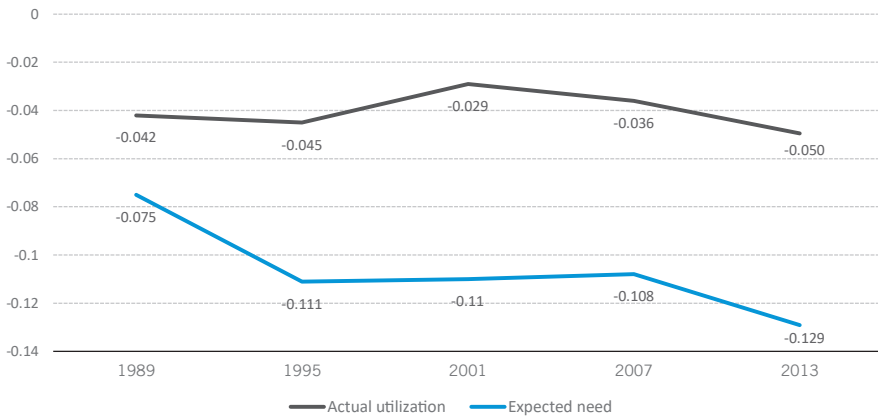
For data-driven, evidence-based policy-making, the government has slowly but steadily evolved its policy to make data available for open public use. However, the organizational infrastructure needed to improve the quality of data and to support wider use is lacking.

7.4.2 Accessibility

Watanabe and Hashimoto (2012), using methodology originally proposed by Wagstaff et al. (1991), measured horizontal inequality – in accessing a health-care facility by using cross-sectional, nationally representative household surveys. Horizontal inequality is calculated as the difference between two types of concentration indices – acute health-care visits over a household's income level and expected health-care needs based on demographic and clinical conditions. By using the dataset from the Comprehensive Survey of People's Living Condition, they calculated horizontal inequality in Japan and the results are presented in Fig. 7.3. The horizontal inequality (gaps between two indices) was negative, indicating that people with a lower household income were likely to withdraw health-care use despite their health care needs. This gap was at its largest in

2001, though it jumped back to approximately -0.05 in 2007 (Sakamoto et al., 2018).

Fig. 7.3 Japan: Horizontal equity in access to health care (concentration indices over household income), age 20+ years, 1989–2013

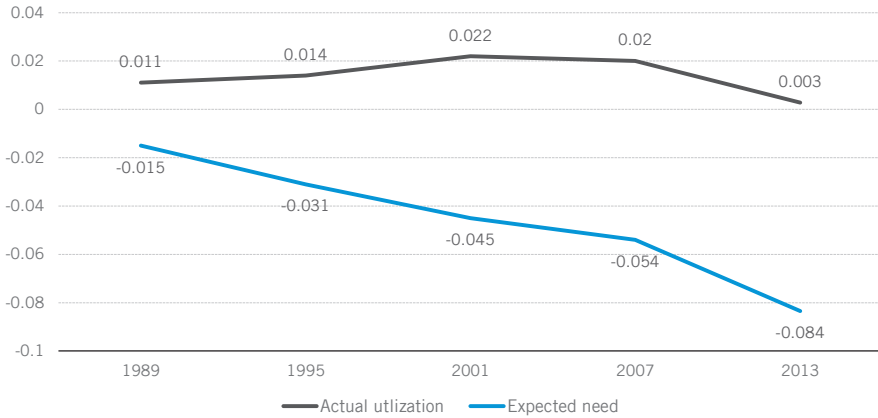


Notes: Actual utilization: concentration indices for actual health-care use; expected need: concentration indices for expected health-care needs (estimated health status)

Source: Sakamoto et al., 2018

Fig. 7.4 and 7.5 show horizontal inequality in access to health care for two age groups (20–64 years and 65 years and above, respectively). Compared with the younger group, horizontal inequality has been low in people aged 65 years and above, presumably due to the reduced co-payment rate, which contributes to equalizing health-care utilization regardless of income levels among the elderly. However, a further decline in horizontal inequality is seen in 2013 among the older age group, which may be an early sign of the declining household capacity to pay for health-care costs due to economic stagnation. Further monitoring is required to assess this trend (Sakamoto et al., 2018).

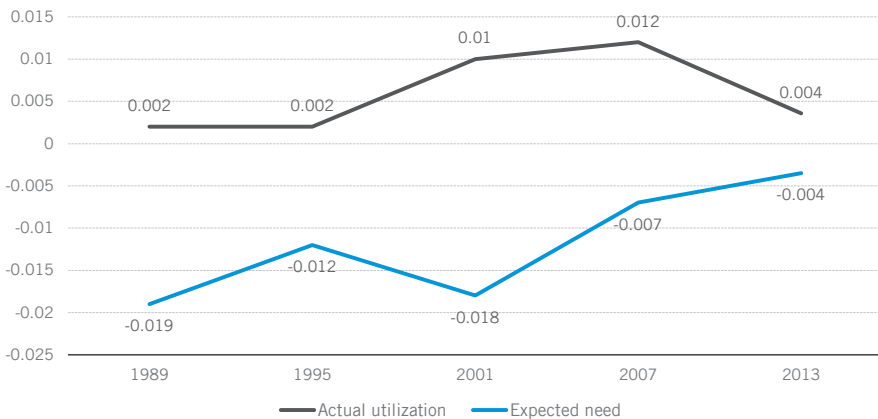
Fig. 7.4 Japan: Horizontal equity in access to health care (concentration indices over household income), age 20–64 years, 1989–2013



Notes: Actual utilization: concentration indices for actual health-care use; expected need: concentration indices for expected health-care needs (estimated health status)

Source: Calculated by Hashimoto from MHLW, 2016d

Fig. 7.5 Japan: Horizontal equity in access to health care (concentration indices over household income), age 65+ years, 1989–2013



Notes: Actual utilization: concentration indices for actual health-care use; expected need: concentration indices for expected health-care needs (estimated health status)

Source: Calculated by Hashimoto from MHLW, 2016d

It is worth noting that the Japanese health-care system does not adequately address the cultural needs of ethnic minorities, especially with respect to language barriers and religious backgrounds. Some efforts are being made in this direction as part of the preparations for the 2020 Tokyo Olympic and Paralympic games, foreseeing that there will be many foreign patients at that time. However, systematic and empirical evidence is scarce, making it difficult to assess the magnitude and severity of this problem.

7.4.3 Resilience

The likelihood of rising expenditure poses risks to fiscal sustainability. The ageing population and increases in the prices of medicines and medical devices have been pushing the total health-care expenditure, which has put a significant burden on the health-care system in Japan. To tackle this challenge, in 2008, the government (both the ruling party and the opposition party) agreed to pass the “Comprehensive Reform of Social Security and Tax”, a joint reform of the social security and taxation system that should improve fiscal sustainability for the health and long-term care system in Japan. It originally planned to raise the consumption tax, with any additional funds from it being channelled for social security costs, including health and long-term care. Though the current Abe Cabinet originally planned to increase the consumption tax rate to 10% in October 2015, it has been postponed to September 2019, which has delayed social security and taxation reform. An increase in the consumption tax being a big political issue, the future progress of reform remains unclear.

Integrated community care system (ICCS)

A majority of the elderly wish to stay in their homes during the very end of their lives. However, because of the increase in the number of unmarried people, single-person households and parent-child separated households, more elderly persons are living alone. Consequently, it is difficult to provide arrangements for them to die at home (78.4% die at health-care facilities). In response to this, the government promoted an Integrated Community Care System (ICCS) in 2006. This system aims to provide appropriate living arrangements, social care and daily life support services within the community as well as integrate prevention, medical services and long-term care for the elderly.

Twelve years since its adoption in 2006, the ICCS continues to be the central core policy of health and long-term care in Japan. However, several challenges remain: how to encourage local stakeholders to participate in the community discussion, how to channelize diverse interests to evolve a consensus on efficient allocation of resources, and how to meet bureaucratic demands both at the central and local government levels.

7.5 Conclusions

Thanks to the overall efficiency of its health system and parallel advances in technology, Japan has for many years enjoyed increased life expectancy, decreased maternal and infant mortality, and a reduced burden of communicable diseases. However, the Japanese health-care system faces several challenges, including an ageing society, increasing health-care expenditure, economic stagnation and increasing inequity, all of which place a heavy burden on the current health-care system.

Fundamentally, what Japan needs is a health-care paradigm shift. Such a shift in Japan's approach to health care has already been proposed in *Japan vision: health care 2035*, a report drafted by young Japanese leaders in health care under the leadership of the then minister Yasuhisa Shiozaki. The goal of *Japan vision: health care 2035* is to build a sustainable health-care system that delivers better health outcomes through care that is responsive and equitable to all members of society, and that contributes to prosperity in Japan and the world. Bearing in mind these transformations by 2035, fundamental reforms that focus on outcomes, quality, efficiency, care and integrated approaches across sectors will be necessary to maintain a low-cost, equitable health system in the future (Miyata et al., 2015).

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Chapter 8. Singapore

Joanne Yoong, Wei Yen Lim, Lydia Lin



8.1 Introduction

8.1.1 Economic context

The Republic of Singapore is an island state in South-East Asia, with a short history of 53 years following full independence in 1965. It is home to 5.61 million people, 100% of whom live in urban areas (World Bank, 2018). From a GDP of US\$ 7.4 billion in 1965, Singapore's GDP reached US\$ 295.0 billion in 2016 (Table 8.1), with a high GDP per capita (constant local currency unit) of S\$ 71 720 and an average GDP growth of 5% per annum over the past 10 years (Lim et al., 2016; World Bank, 2018).

Following the aftershocks of the 2008 financial crisis, Singapore's GDP shrunk 0.6% from 2008 to 2009 but quickly recovered, growing by 15.2% in 2010, 6.2% in 2011 and 3.9% in 2012 (World Bank, 2018). Unemployment rates increased to 4.4% in 2009 but have since returned to relatively low levels, at 2.0% in 2017 (ILO, 2018).

Median monthly income per household member grew from S\$ 1235 in 2005 to S\$ 2699 in 2017 among resident households. From 2012 to 2017, growth in average household income from work per member was faster among the lower 50% of households (4.2–4.6% per annum) than the higher 50% (2.2–4.2%). In 2017, the Gini coefficient was 0.459 (0.401 after taking into account government transfers and taxes), the lowest in a decade, although higher than the reported OECD 2014 average of 0.318 (Department of Statistics Singapore, 2018; OECD, 2018a).

Table 8.1 Singapore: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	2.4	3.0	4.0	5.1	5.5	5.6
Population density (people per sq.km of land area)	3602.9	4548	6011.8	7231.8	7806.8	7915.7
Fertility rate, total (births per woman)	1.8	1.8	1.6	1.2	1.2	1.2 (2016)
Birth rate, crude (per 1000 people)	17.6	18.2	13.7	9.3	9.7	9.4 (2016)
Death rate, crude (per 1000 people)	4.9	4.7	4.5	4.4	4.8	4.8 (2016)
Population growth (annual %)	1.3	3.9	1.7	1.8	1.2	0.1
Population ages 65 and above (% of total)	4.7	5.6	7.3	9.0	11.7	12.9

Table 8.1 Singapore: Socioeconomic indicators, 1980–2017 (contd)

Indicators	1980	1990	2000	2010	2015	2017
Age dependency ratio, old (% of working-age population)	6.9	7.7	10.3	12.2	16.0	17.9
Age dependency ratio, young (% of working-age population)	39.6	29.4	30.1	23.5	21.3	20.8
GDP (current US\$, billions)	11.9	36.2	95.8	236.4	304.1	323.9
GDP per capita (current US\$)	4927	11 864.3	23 792.6	46 569.7	54 940.9	57 714.3
GDP growth (annual %)	10.0	10.0	8.9	15.2	2.2	3.6
Gross national expenditure (% of GDP)	106.9	89.9	87.7	73.9	74.3	75.7
Tax revenue (% of GDP)	17.0	14.5	14.9	13.0	13.3	13.7 (2016)
Central Government debt, total (% of GDP)	..	77.8	84.1	102.9	104.6	112.3 (2016)
Industry, value added (% of GDP)	34.9	30.8	32.5	26.1	24.2	23.2
Agriculture, forestry and fishing, value added (% of GDP)	1.5	0.3	0.1	0.04	0.03	0.03
Services, value added (% of GDP)	59.9	64.2	60.6	68.3	69.9	70.4
Labour force, total (in millions)		1.5	2.0	2.8	3.2	3.3
Unemployment, total (% of total labour force) (modelled ILO estimate)	..	..	3.7	3.2	1.7	2.0
Current health expenditure (% of GDP)	..	..	3.4	3.2	4.3	..

Key: GDP: gross domestic product; ILO: International Labour Organization

Source: World Bank, 2018

8.1.2 Political context

The history of modern Singapore is marked by the establishment of a trading port by Stamford Raffles in 1819. Following the Anglo-Dutch Treaty of 1824, Singapore was established formally as a British colony; subsequently it developed into a major regional port. In 1959, following a wave of nationalism, Singapore was granted self-government and held its first general election. In 1963, Singapore joined the Federation of Malaya, Sarawak and North Borneo to form Malaysia, but this arrangement was short-lived, leading to its independence as a sovereign democratic republic in 1965.

As a former colony, Singapore’s legal system is based on English common law and a unicameral parliamentary system modelled after the Westminster system. Elections are contested within constituencies in general elections,

and the winners of each contest become members of Parliament for that constituency. Currently, there are 36 political parties registered in Singapore (Singapore Elections, 2018). However, every election since 1959 has been won by the main political party, the People's Action Party (PAP). Other notable parties include the Worker's Party and the Singapore Democratic Party.

8.1.3 Natural and human-induced disasters

Singapore is located at the tip of the Malay Peninsula in South-East Asia. Among 38 small island states, Singapore is an exception to not have recorded natural or human-induced disasters (Pelling and Uitto, 2001). The country is considered seismically safe as it is situated on a stable part of the Eurasian plate away from major fault lines. Exposure to other physical risk is relatively low due to its geographically favourable location between Malaysia, Sumatra and Borneo. Disaster resilience is also favourably shaped by a generally stable economy and political climate, as well as the establishment of good working relationships with key global actors, including the UN, WTO, Asia-Pacific Economic Cooperation (APEC) and ASEAN.

8.2 Health status and risk factors

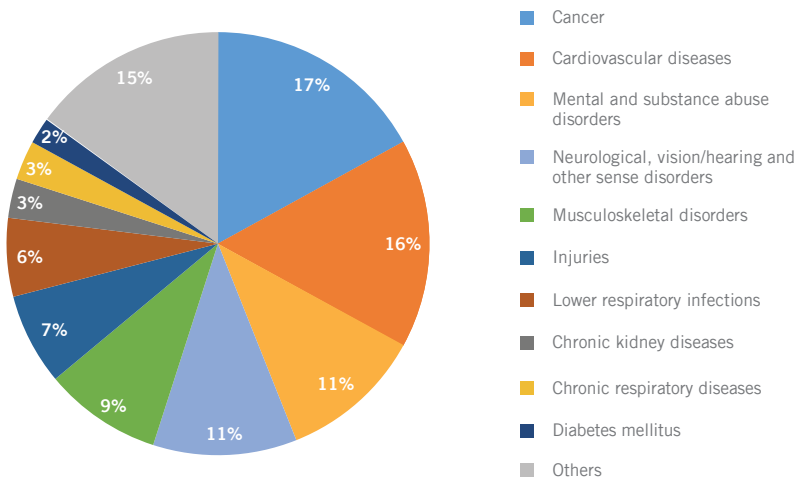
8.2.1 Health status

Life expectancy at birth has increased from 65.8 years in 1970 to 82.9 years for both genders in 2016, with women enjoying a higher average life expectancy of 85.1 years and men, 80.6 years (Department of Statistics Singapore, 2017; WHO, 2018). Significant improvements made in the areas of MCH have kept infant and under-five mortality rates low. The IMR per 1000 live births was 2.4 in 2016, compared to 20.5 in 1970. Similarly, the under-five mortality rate per 1000 live births decreased from 7.7 in 1990 to 2.8 in 2016 (World Bank, 2018).

In 1940, mortality due to communicable diseases was the leading cause of death (57%) but this was reduced to 37% in 1960, and further to 15% in 1980, suggesting completion of its epidemiological transition (Lim et al., 2013). Mortality due to NCDs steadily increased to represent 80% of all deaths in 2013 (MoH, 2017a). In 2017, the leading causes of mortality were

cancer, pneumonia and ischaemic heart disease (IHD), which together account for 67.7% (two thirds) of deaths (MoH, 2017a). In 2015, the disease burden was a total of 705 071 DALYs lost to mortality and morbidities, of which more than half (55%) were contributed by cancers (17%), CVDs (16%), neurological, visual/hearing/sense disorders (11%), and mental and substance abuse disorders (11%) (Fig. 8.1) (MoH, 2017b).

Fig. 8.1 Singapore: Distribution of DALYs by major disease groups, 2015



Source: MoH, 2017b

A total of 64 341 incident cases of cancer were diagnosed among the resident population during the period 2011–2015 (National Registry of Diseases Office, 2017). Of these, 31 284 (48.6%) were men and 33 057 (51.4%) women. The age-standardized incidence rate for all cancers in 2015 based on the most recent GBD Study was 305.5 per 100 000, faring well in comparison to the OECD average of 444.1 per 100 000 (Melaku et al., 2018). Of all cancers, colorectal, lung and prostate cancers were the three leading cancers diagnosed among men. Among women, breast, colorectal and lung cancers were the most common. The highest mortality rates were recorded for lung cancer among men and breast cancer among women (National Registry of Diseases Office, 2017).

While IHD is OECD's leading cause of all deaths, IHD is the third most common cause in Singapore (National Registry of Diseases Office, 2018; OECD, 2017). Mortality rates for coronary heart disease have shown consistent declines in Singapore over the past 15 years, although men still have almost twice the death rate of women, a difference that has remained constant over the years (National Registry of Diseases Office, 2018). The incidence of events of AMI among adults has also decreased since 1990. Similar to the general population's ethnic distribution, most of the episodes of AMI occurred among the Chinese, followed by the Malays and the Indians. The age-standardized mortality rate declined significantly from 33.5 per 100 000 in 2007 to 17.0 per 100 000 in 2016 (National Registry of Diseases Office, 2018).

8.2.2 Risk factors

Singapore is a tropical climate in close proximity to the equator, with no natural seasons in terms of moisture and thermal changes. The island has high humidity, abundant rainfall and relatively constant temperatures between 24 °C and 31 °C throughout the year. These particular conditions mean that Singapore is susceptible to mosquito-borne diseases, including dengue fever, malaria and chikungunya fever. As a major global trade and travel hub, Singapore is well connected to many cities around the world, and remains vulnerable to outbreaks and importation of communicable diseases (MoH, 2017c).

The prevalence of lifestyle factors that predispose to cancer and CVDs is higher among men than women in Singapore. The 1992–2010 National Health Surveys show that men have a consistently higher prevalence of smoking, hypertension, consumption of daily alcohol, and hyperlipidaemia than women. The prevalence of obesity has grown from 5.1% in 1992 to 10.8% in 2010 (MoH, 2017b), and is a major concern in Singapore as in other parts of the world. A total of 81.0% of the adult population between 18 and 69 years of age reported no regular physical activity in 2010 (MoH, 2011). Separately, the prevalence of diabetes mellitus increased from 8.6% in 1992 to 11.3% in 2010 (MoH, 2011). It has been estimated that one in three Singaporeans will develop diabetes over their lifetime, with a projected 1 million persons with diabetes by 2050, prompting the country's declaration of a whole-of-nation campaign called the "War on Diabetes" (MoH, 2017d).

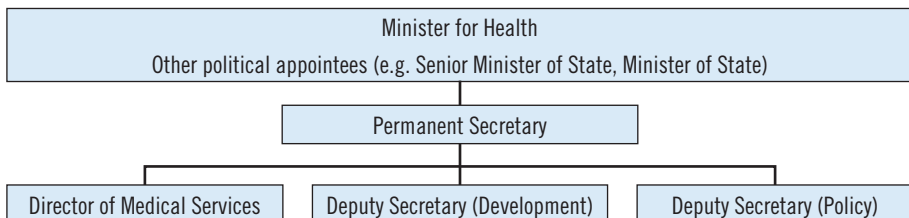
Singapore also faces new challenges with a rapidly ageing population. Total fertility (births per woman) is steadily decreasing, from 3.1 in 1970 to 1.2 in 2016, below the replacement level of 2.1 (Department of Statistics Singapore, 2017). At the same time, the percentage of the population aged 60 years and above is projected to increase from 19.5% in 2017 to 30.6% by 2030, and to 40.1% by 2050 (United Nations Population Division, 2017). As this demographic shift increases the dependency ratio, it is expected that the burden of chronic diseases and contributions to health-care cost will continue to grow. The health workforce also faces the challenges of an ageing population and the swiftly changing expectations of medical care. One challenge is to ensure that adequate numbers of health-care professionals are trained in the areas of elderly care such as geriatric medicine, and intermediate- and long-term care (ILTC). With the demands of chronic and multiple comorbid conditions, the health-care system has to fundamentally change the way services are organized and delivered. Many of the reforms are aimed at addressing these challenges; which is discussed in the subsequent sections.

8.3 The health system

8.3.1 Organization and governance

The MoH has overall regulatory powers, and is led by the minister, the permanent secretary and senior civil servants. The two key functional arms of the MoH are the Policy and Corporate Group, led by two deputy secretaries for health, and the Professional Group, led by the director of medical services (Fig. 8.2).

Fig. 8.2 Singapore: Leadership structure and organization of the MoH



Source: By the authors

Singapore has a mixed service delivery model. Prevention services are primarily provided through the MoH's statutory boards – the Health Promotion Board and the Health Sciences Authority. Public providers deliver 80% of acute care services; in primary care, 80% of the demand is met by private providers, while 20% is delivered through 20 government polyclinics (Haseltine, 2013; Lim et al., n.d.). The government has emphasized the importance of ILTC (e.g. nursing homes, community hospitals and hospices), especially for the elderly and those suitable for home care. Community hospitals focus on inpatient rehabilitative or convalescent care and are mostly run by not-for-profit voluntary welfare organizations (VWOs). Other services, such as day-care centres and nursing homes, are run by both for-profit companies and VWOs. In addition to facilities, the MoH provides development grants for providers of ILTC (Lim et al., n.d.).

Following the 1983 National Health Plan, public hospitals were “corporatized” or “restructured”, i.e. hospitals remained publicly owned but run as private enterprises, which would provide autonomy to the management and flexibility to respond to patient needs. Introduction of competition was also intended to increase choices and cost-sharing for consumers (Lim et al., n.d.). Today, all public hospitals are managed by a holding company for public health-care assets called MoH Holdings (MoHHs) and are overseen by and coordinated through the MoH. Unlike private hospitals, they receive government funding for providing subsidized medical services. An MoHH develops and builds the physical and information technology (IT) infrastructure as well as the recruitment and human resource management framework for the entire public health-care sector, and performs selected systems-level finance, advisory and support functions. The MoH as regulator ensures standards for patient safety, welfare and continuity of care by drafting and effecting laws pertaining to health-care standards, enforcement and audit to ensure compliance, influencing the conduct of health-care professionals and establishing national standards of care provision.

In 2000, public health-care institutions were concentrated in two clusters – Singapore Health Services and the National Healthcare Group – but these were lacking in adequate step-down care, ILTC and community-based

care services. To better integrate partner networks and providers, a regional health system concept was implemented in 2009, resulting in six geographically defined regional health systems – Singapore Health Services, the National Healthcare Group, National University Health System, Alexandra Health Pte Ltd, Jurong Health Services and the Eastern Health Alliance (Lim et al., n.d.; Ong SE et al., 2018). In 2017, it was announced that the six regional health systems would be further reorganized into three integrated clusters – Singapore Health Services, the National Healthcare Group and National University Health System – each offering a fully comprehensive suite of services encompassing acute, primary and community care (Hui, 2017).

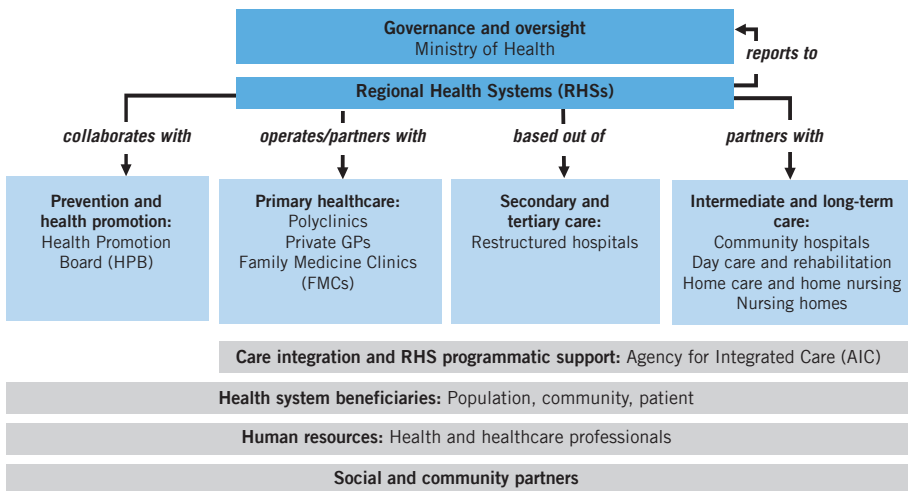
8.3.2 Patient-centredness

The initial concept of the regional health systems was intended to enable patient-centred care, promote newly integrated clinical pathways and care coordinators who work with multidisciplinary teams over the patient's lifetime. Subsequent strengthening of enablers and linkages between providers have furthered this aim (Saxena, 2009), including efforts to integrate specialist outpatient clinics and primary care providers to improve chronic disease management and community-based care. For example, the Frontier Family Medicine Clinic and the National University Hospital (NUH) formed a partnership to allow follow up of chronic and specialist outpatient care at clinics rather than hospitals. Supported by data linkages, primary care physicians of the Frontier Family Medicine Clinic were able to access appropriate patient information of the NUH and facilitate shared care, resulting in fewer appointments, more continuous care and system-level savings (MoH, 2015a). Similarly, under Khoo Teck Puat Hospital's Ageing-in-Place programme, community nurses are deployed to manage patients at home, serving as a single point of contact for health-care services (e.g. home care and specialist appointments) as well as non-medical services (e.g. befriending, wellness and home help). Over 3000 patients have benefited from the Ageing-in-Place programme and similar islandwide programmes, and readmission rates have fallen by 61% (Hui, 2013; MoH, 2015a). Other cluster-led efforts have focused on inpatient and ILTC services, such as the co-location of community

hospitals for rehabilitation with acute hospitals, and linkages with other community-based post-discharge/step-down services.

The Agency for Integrated Care plays a key role at the national level (Fig. 8.3). The Agency for Integrated Care began as a division of the MoH, responsible for coordinating placements for ILTC services, but is now an independent corporate entity (Agency for Integrated Care, 2018) stewarding the VWO-driven ILTC sector. The Agency coordinates referrals to ILTC services, facilitates discharge planning for patients from acute-care hospitals and disburses grants directly to patients on behalf of the MoH and Temasek Cares, such as the Senior Mobility Fund and the Caregivers' Training Grant. The Agency for Integrated Care also fosters the progress of the ILTC sector by promoting human resource development, developing service standards, piloting new programmes in partnership with providers, building institutional capabilities and educating patients (Saxena, 2009).

Fig. 8.3 Singapore: Key actors in service integration



Source: Adapted from Ong SE et al., 2018

8.3.3 Financing

Singapore's financing system is motivated by the twin philosophies of individual responsibility while safeguarding basic, affordable health care for all (Republic of Singapore Ministerial Committee on Health Policy,

1993). Health expenditure rose from 3.93% of the GDP in 2011 to 4.92% in 2014, but this remains low relative to the OECD average of 9% in 2015 (OECD, 2018b; WHO, 2018). Health-care costs are typically covered by a mix of government subsidies, statutory financing schemes, private voluntary insurance, employer medical benefits and OOP payments (Ong SE et al., 2018). Public health-care services are subsidized up to 80%, depending on means-testing. Three statutory financing mechanisms (the “3Ms”) are central to financing the remaining portion – Medisave, MediShield Life and Medifund. Implemented in 1984, Medisave is a mandatory medical savings account financed from payroll deductions, which can be used by an individual or their immediate family to pay for hospitalization, day surgery and approved outpatient expenses. MediShield Life is a universal health insurance scheme that provides lifelong catastrophic cover for large hospitalization bills and selected specialist outpatient treatments (e.g. chemotherapy, kidney dialysis); supplemental coverage can be purchased in the form of private integrated shield plans and riders. Premiums for MediShield Life and integrated shield plans can be paid using Medisave (Khalik, 2016). Finally, the Medical Endowment Fund or Medifund is an endowment set aside to support those in financial difficulty even after subsidies, Medisave and Medishield are exhausted (MoH, 2018a).

OOP expenditures were 54.8% of the total spending on health in 2014, higher than the OECD average of 13.6% in the same year (OECD, 2018b; Ong SE et al., 2018). Recent initiatives to lower OOP payments include the Community Health Assist Scheme, which comprises means-tested subsidies for private primary care and subsidies for lower-income households. These are provided for ILTC services at MoH-funded institutions as well as day rehabilitation, home medical, home nursing and home palliative services).

8.3.4 Physical and human resources

In 2017, there were 2102 registered private primary care clinics and 20 public polyclinics, and 250 public and 861 private dental clinics (MoH, 2018b). There were nine public and nine private acute hospitals; and an additional eight national specialist centres providing cancer, cardiac, eye, skin, neuroscience and dental care. Patients requiring intermediate care

were discharged to eight community hospitals. Seventy-three nursing homes and two inpatient hospices met demands for residential long-term care (MoH, 2018b). In the same year, there were 2.4 doctors, 0.4 dentists, 0.5 pharmacists and 7.4 nurses per 1000 population (MoH, 2018c). These ratios are low compared to other developed countries with generally older populations (Lim et al., n.d.). Efforts are being made to increase local training capacity and facilitate mid-career conversions, as well as respond to changing population needs. The number of trainees in family medicine is set to increase by 30% while those for internal, geriatric and rehabilitation medicine will increase by 93% in 2019 compared to 2015. By 2020, 92% more advanced practice nurses will be registered, with their professional capabilities expanded to oversee nurse-led primary and community care clinics, and implement evidence-based care programmes (MoH, 2016).

8.3.5 Provision of services

Management of NCDs

The Health Promotion Board was established in 2001 to drive national health promotion and disease prevention, especially to address smoking, obesity, physical inactivity and poor nutrition. Some key initiatives of the Health Promotion Board include the 2014 Healthy Living Master Plan to facilitate nationwide healthy living; the Healthier Dining programme, which identifies and labels healthier eating options in 2700 outlets at over 60 hawker centres and 450 coffee shops (Lai, 2017), and the National Steps Challenge. The Health Promotion Board also works with the regional health systems to conduct community health screenings and intervention programmes.

Recognizing that a strong primary care sector is critical to managing NCDs in an ageing population (MoH, 2017e), the Chronic Disease Management Programme was first introduced in 2006 for diabetes, hypertension, hyperlipidaemia and stroke. Today, the programme covers 20 chronic diseases (MoH, 2015b). The Programme coordinates systematic, evidence-based chronic disease management programmes across 700 general practice clinics and groups, and enables the use of Medisave to cover these conditions (MoH, 2015b).

As mentioned earlier, a national strategy focused specifically on arresting the rise of diabetes and related complications, the “War on Diabetes”, was announced in 2016 (MoH, 2017d), with a dedicated S\$ 15 million injected into Health Promotion Board’s efforts towards diabetes prevention in addition to an existing S\$ 20 million grant in 2015 (Choo, 2018).

A National Mental Health Blueprint was first collaboratively developed in 2007 by the MoH, the Institute of Mental Health, Health Promotion Board, various hospitals, the Ministry of Education and the Ministry of Community Development, Youth and Sports. This plan proposed a holistic approach from screening to treatment, and focused initiatives on children and youth, working adults and the elderly. In response to anticipated national demand in an ageing population, the MoH launched a Community Mental Health Masterplan in 2012 with additional funding, and further committed to another five-year plan in 2017 (MoH, 2017e).

Management of communicable diseases including emerging diseases

Singapore’s Infectious Diseases Act was promulgated in 1976 and is jointly administered by the MoH and the National Environment Agency. It empowers the Director of Medical Services and the Director-General of Public Health from the National Environment Agency to implement measures for outbreak prevention and control, and to prevent the introduction of disease. The agency also formulates guidelines for reporting and notification (Lim et al., n.d.).

Childhood immunization programmes date back to BCG in the mid-1950s, and today cover hepatitis B; diphtheria, pertussis and tetanus (DPT); poliomyelitis; Hib; measles, mumps and rubella; pneumococcal disease; and human papillomavirus (HPV), although only DPT and measles, mumps and rubella are compulsory (MoH, 2017c). By 2016, the programme achieved 99.2% coverage for BCG, 96.1% for hepatitis B, 97.0% for DPT, 91.8% for Hib, 94.7% and 88.2% for the first and second doses of measles, mumps and rubella, and 80.6% for pneumococcal disease (MoH, 2017c).

The burden of malaria, TB and HIV/AIDS has been kept relatively low. Despite being in a malaria-endemic region, Singapore has remained malaria-free by WHO standards since 1982 (Lim et al., n.d.), with a 2016

incidence of 0.4 per 100 000 (of which 95.2% of cases were imported). An Advisory Committee on AIDS was formed by the MoH in 1985, soon after the first reported case. Under the current National HIV/AIDS Control Programme, Singapore reported 408 notifications for HIV infection in 2016. However, sustained declines in the cases of TB after the introduction of the Singapore Tuberculosis Elimination Programme (STEP) in 1997 are possibly in reversal. In 2016, 2310 new cases of TB were reported (up 15.5% from 2015), including three new cases of drug-resistant TB, which is of concern (MoH, 2017c).

Dengue fever is endemic, with severe outbreaks in 2005, 2007 and 2013 (the worst year, with 22 170 cases) (Lim et al., n.d.). The surveillance programme was enhanced in 2015 to include samples from polyclinics and private laboratories, in addition to an islandwide network of general practitioners (Ong SE et al., 2018). The year 2017 saw a lull, consistent with an historical trend where the predominant serotype switches to one for which local seroprevalence is high, perhaps contributing to the currently low number of dengue cases. There are no signs of an outbreak in 2018 (Ong J et al., 2018).

Hand, foot and mouth disease is also endemic and is legally notifiable by medical practitioners, child-care centres or kindergartens (MoH, 2017c). A total of 42 154 cases of hand, foot and mouth disease were reported in 2016, with an incidence of 751.7 per 100 000 (MoH, 2017c). The protocol for response includes viral isolation and, since 2010, child-care centres or kindergartens with prolonged transmission of hand, foot and mouth disease are identified on the website of the MoH, followed by mandatory 10 days' closure if disease transmission exceeds 16 days. These measures continue to be enforced along with public education.

In 2016, Zika virus disease was declared a Public Health Emergency of International Concern. The first case imported from Brazil was reported in May 2016; the first local cluster was reported in August 2016. An epidemiology team was formed to enhance response capabilities and the outbreak (298 cases) was contained four weeks after coordinated national action (MoH, 2017c).

Management of MCH

Singapore's 2016 MMR was 4.8 in 100 000 (MoH, 2017c). Childhood mortality is very low and mainly associated with conditions such as stillbirths of unknown cause, genetic disorders and serious accidents (Department of Statistics Singapore, 2017; Ho, 2009). Medisave may be used to cover maternity care (including assisted reproduction), as well as health-care services for children. All Singaporean newborns receive an immediate Medisave grant of S\$ 4000 as well as a Baby Bonus (a cash transfer of S\$ 6000–S\$ 8000 and a matched savings account that can be used for health care and early childhood interventions).

8.4 Performance of the health system

8.4.1 Effectiveness and quality

Singapore has seen a rapid convergence to world standards in health outcomes such as life expectancy (currently 83 years) as well as infant mortality and under-five mortality. Performance indicators such as vaccination coverage, cancer survival and 28-day survival from AMI are comparable to and often better than those for other developed countries. Health-care costs are low compared to other high-income countries, but with better or similar outcomes. In 2014, the efficiency of Singapore's health system was ranked first of 51 countries by Bloomberg; and its health-care outcomes second in the world (Bloomberg, 2014; The Economist Intelligence Unit, 2014).

Singapore is committed to and has done well with respect to the SDGs (Lim et al., 2016). In the Global Burden of Diseases, Injuries, and Risk Factors Study 2016, Singapore scored the highest among 188 countries evaluated on 37 of 50 health-related SDG indicators monitored over 1990–2016, with a score of 86.8 out of a possible 100 (followed by Iceland with 86.0 and Sweden 85.6, and relative to a global median score of 56.7) (Fullman et al., 2017).

In areas such as performance monitoring and public availability of these data, Singapore is making good progress. The effectiveness and quality of health care for Singaporeans are regularly tracked and reported to Parliament as key performance indicators of the MoH. Hospital-related

data are collected and monitored, including financial data (such as costs to patients) and hospital utilization data (such as the number of surgeries, bed occupancy rates, waiting times, discharge diagnoses, inpatient and outpatient numbers). The list of indicators also includes many tracer indicators for the health-related MDGs/SDGs (e.g. vaccination coverage) and chronic conditions as recommended by WHO and the World Bank (e.g. premature mortality from cancer) (Tan et al., 2014). Recent quality improvement initiatives include the development of the National Standards for Healthcare to ensure that the health-care delivered is appropriate to the patient's needs based on current evidence and clinical knowledge across the continuum of health care (Scheutz, 2013). These standards are also used to benchmark health-care providers in Singapore against others around the world. To promote greater transparency, hospitals are encouraged to publish the clinical outcomes of common procedures on the Internet (MoH, 2018a). The MoH also conducts regular national surveys to monitor the health status of Singaporeans, and commissions independent patient satisfaction surveys to monitor the patients' perception of care and providers (Scheutz, 2013).

Realizing that the effectiveness of initiatives and novel technology should be evaluated against the availability of financial resources, the MoH set up the Agency for Care Effectiveness in August 2015. The Agency for Care Effectiveness was established as a national HTA agency to drive better decision-making in health care in future, and to support care that offers better value (i.e. effectiveness per unit cost) (Agency for Care Effectiveness, 2018).

8.4.2 Accessibility

Singapore has been actively broadening its safety nets for financial protection in healthcare, including schemes such as the Pioneer Generation Package (benefits for cohort of Singaporeans born in/before 1949), MediShield Life, and improvements to the Community Health Assist Scheme. The redesigned MediShield Life scheme that was introduced to the public in 2015 has also helped to improve accessibility of basic health insurance to those who were previously too old or too ill to be insured. MediShield Life is universal, covering all Singapore Citizens and Permanent

Residents on a mandatory basis, including the elderly (no maximum age) and those with pre-existing conditions or congenital abnormalities. In the first 10 months of its implementation, MediShield Life paid out \$102.5 million in 65,000 claims to people who previously had not been insured (Khalik, 2016). Singapore was among the top Asian and ASEAN countries on the Healthcare Access and Quality Index based on the 2015 Global Burden of Disease studies (Barber et al., 2017).

One common criticism is that the profusion of new schemes, subsidies and exemptions has resulted in a system that is in principle more accessible, but in practice overly complicated and challenging to navigate for the ordinary consumer (Lim et al., n.d.), which strengthens the case for integration and simplification (Ong SE et al., 2018).

8.4.3 Resilience

The outbreak of SARS in Singapore in 2003 was a watershed event that led to significant strengthening of health systems related to the surveillance and containment of emerging infectious diseases. Post-SARS, health-care policy-makers have continued to invest in building a health-care system with the capacity to respond pre-emptively and decisively to contain the threat of new outbreaks, including the commitment to establish a new 330 bed National Centre for Infectious Diseases by end of 2018.

As Singapore prepares for the impact of ageing, the definition of resilience has widened to include efforts to build capacity to address the long-term threat of chronic diseases. Efforts at prevention are being scaled up to reduce future downstream costs. This includes large-scale efforts at health promotion, such as the continuing commitment to the “National Steps Challenge”, the War on Diabetes, and Screen-for-Life, the national screening programme. While continuing to upgrade its hospital infrastructure (including the recent addition of new co-located general and community hospitals), Singapore is refocusing on primary and community-based care, building family medicine clinics and community health centres, and increasing nursing home beds and places for centre- and home-based care.

In addition to physical infrastructure, these future needs imply necessary growth in other pillars of the health-care system. While the government has

begun to work towards a “future-ready health-care workforce” through initiatives such as skills training and re-training courses, there is growing recognition that with Singapore’s limited local labour pool, this growth will be unsustainable without structural changes in the deployment of human resources or increased dependence on foreign skilled labour. Singapore thus looks towards technology as a primary driver of gains in efficiency and future sustainability. New models of care are being piloted, which rely heavily on technology to enable more effective and cost-efficient service delivery outside the traditional labour-intensive, hospital-based setting, such as tele-monitoring for patients with stable chronic disease in the community. From the IT perspective, national electronic medical records – a key backbone for integration and coordination of care – remain a work in progress. Steps have been recently taken towards having disparate institutions link their records, including making it compulsory for private facilities to provide patient data, and grants to help nursing homes and private clinics develop their systems. To remain committed to UHC requires balancing efforts at financing and managing the attendant fiscal pressures from increases in government health-care spending. These include recent changes that prevent first dollar cover, even under private medical insurance.

Most notably, at the highest-level of policy-making, Singapore has taken the explicit step of setting up an Office of Healthcare Transformation, led by a chief scientist with the mandate of test-bedding innovations to support a long-term vision of the future health-care system, through collaborations across the government as well as the private sector. The Office of Healthcare Transformation began operations in January 2018.

8.5 Conclusions

Looking ahead, the MoH has espoused a strategic vision based on three key shifts that will drive the health-care sector in the coming years. The first of these is to go “beyond hospital to community”, bolstering the full spectrum of service delivery outside acute care towards not just primary care but a robust long-term care sector as well as community-based models of care. The supply-side expansion of primary and community care, as mentioned above, will continue under the Healthy Workplan 2020 and beyond, and

be supported by the planned roll-out of a national community nursing programme. Other future developments that will enable broader access to care include the redesigning of the existing long-term care insurance financing framework, to be renamed CareShield. While details of the new scheme are yet to be finalized, the financing of long-term care will be expanded in a manner similar to MediShield Life, providing universal lifetime coverage at the cost of increased premiums, although with significant subsidy support for smooth transition.

The second thrust is to go “beyond quality to value”, driving innovations towards cost efficiency. In addition to the establishment of Agency for Care Effectiveness, the MoH is currently engaged in discussions around value-driven outcomes or efforts to implement reporting frameworks that increase transparency with respect to quality and cost indicators to activate change. Pilots of value-driven outcomes are in their initial stages across the major health-care clusters, but future developments are likely to see expansion of scope throughout the public health-care system as well as the range of quality indicators to include patient-reported outcomes. The MoH is also examining the feasibility of using mechanisms of bundled payments in the near future.

Finally, the third shift envisions going “beyond health-care to health”, underlining the importance of healthy living and preventive care at home, in the community and the workplace. Efforts to coordinate stakeholders and empower individuals will strongly leverage technology as part of Singapore’s Smart Nation platform. Future plans are likely to build upon the recently launched consumer-facing gateway, HealthHub, an integrated platform that enables Singaporeans to access their own records and other online services. This third shift implicitly acknowledges the role of the social determinants of health, and a greater recognition of the importance of integrating not just health-care services but health and social care more broadly. In 2018, as part of efforts to further bring health and social care together for the ageing population, the MoH announced a merger between the Agency for Integrated Care and the Pioneer Generation Office, to be renamed the Silver Generation Office, with an expanded mandate to coordinate care for seniors and their caregivers.

Key challenges will continue to emerge due to the rapid transition to a super-aged society, coupled with inflation of health-care costs. Given the strong past performance of the health-care system, and despite the large strides made in the past towards greater efficiency, capturing incremental value in a mature health-care system will become increasingly difficult. Singaporeans now hold higher expectations of quality of service and scope for co-managing their health, which sets a high bar for patient satisfaction. Finally, while chronic diseases loom large in the planning of health services, emerging communicable diseases remain an important threat, including the rising background spectre of drug resistance. Meeting these challenges will require continuing innovation, collaboration and commitment from all stakeholders.

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Chapter 9. Sri Lanka

Palitha Abeykoon, Lalini Chandika Rajapaksa, Sudirikku Hennadige Padmal de Silva



9.1 Introduction

The Democratic Socialist Republic of Sri Lanka is an island nation separated from south-eastern India by a narrow strip of sea not more than 40 km at its widest point. The country is home to 21.4 million people and has a population density of 342.0 per sq.km. The population of Sri Lanka is predominantly Sinhalese, the majority of whom are Buddhists. Sri Lankan Tamils make up around 15.3% of the population and Sri Lankan Moors a further 9.3% (Department of Census and Statistics, 2015). In 2009, the Sri Lankan government won a war against Liberation Tigers of Tamil Eelam (LTTE), which was ongoing for over 25 years. A large proportion of the population is literate; life expectancy at birth is 75 years, the Human Development Index is 0.766, ranking Sri Lanka at the 72nd place (UNDP, 2016) and the Sustainable Development Goal (SDG) Index for Sri Lanka is 62 (Fullman et al., 2017).

The country has a fast ageing population (Table 9.1), a feature of this process being its feminization. Fifty-six per cent of the elderly population are women (Department of Census and Statistics, 2015); this proportion increases to 61% among those 80 years and above. A decline in the total dependency ratio is noted, with a lowering of child dependency and an increase in elder dependency.

9.1.1 Economic context

At the time of Independence, the country's economy was dependent on the export of tea, rubber, coconut and graphite. These commodities brought in favourable incomes, which supported the pursuit of a welfare economy focused on equity. This has paid dividends in terms of significant improvements in human development; however, the high consumption, low investment in economic development, declining commodity prices and failure to diversify led to a decline in the economy. A change in the political scenario in 1977 led to economic liberalization, which has been pursued since then (Indraratna, 1998).

Currently, Sri Lanka is an LMIC with a per capita GDP of US\$ 4065.2 (2017). The economy grew markedly in the post-conflict period, reaching an annual GDP growth rate of 8% in 2010 but has had a declining trend from 2012.

Unemployment as a percentage of the total labour force has continuously declined from 1990 to 2016. The poverty head count ratio was reported to be 4.1 in 2016 (World Bank, 2018) and the income share held by the lowest 20% has declined since 2012 (World Bank, 2018). The main sectors of the economy are tourism, tea export, apparel and textile export. Overseas employment contributes substantially to foreign exchange earnings.

The service sector is the major contributor to the GDP (56.8%), employing 44% of the workforce; manufacturing industries contribute approximately 26.8% of the GDP and employ about 27% of the workforce, while agriculture accounts for approximately 6.9% of the GDP and employs 25% of the workforce (Ministry of Finance, 2017).

Table 9.1 Sri Lanka: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	15.0	17.3	18.8	20.2	21.0	21.4
Population density (people per sq.km of land area)	239.8	276.3	299.5	322.1	334.3	342
Fertility rate, total (births per woman)	3.4	2.5	2.2	2.2	2.1	2.0 (2016)
Birth rate, crude (per 1000 people)	27.0	20.6	18.5	17.5	15.6	15.3 (2016)
Death rate, crude (per 1000 people)	6.3	6.5	7.0	6.5	6.8	6.9 (2016)
Population growth (annual %)	1.7	1.3	0.6	0.6	0.9	1.1
Population ages 65 years and above (% of total)	4.4	5.5	6.2	7.3	9.3	10.1
Age dependency ratio, old (% of working-age population)	7.3	8.8	9.3	10.9	14.1	15.3
Age dependency ratio, young (% of working-age population)	60.1	51.4	39.9	37.8	37.2	36.4
GDP (current US\$, billions)	4.0	8.0	16.3	56.7	80.6	87.2
GDP per capita (current US\$)	267.7	463.5	869.5	2808.5	3842.2	4065.2
GDP growth (annual %)	5.8	6.4	6.0	8.0	5.0	3.1
Gross national expenditure (% of GDP)	122.6	107.9	110.6	107.3	107.5	107.2
Tax revenue (% of GDP)	..	19.0	14.5	11.3	12.4	12.3 (2016)
Central Government debt, total (% of GDP)	..	96.6	96.9	71.6	77.7	..
Industry, value added (% of GDP)	29.9	26.3	27.3	26.6	27.2	27.2
Agriculture, forestry and fishing, value added (% of GDP)	27.8	26.7	19.9	8.5	8.2	7.7
Services, value added (% of GDP)	42.3	47	52.8	54.6	57.4	55.8
Labour force, total (in millions)	..	7.4	7.8	8.2	8.5	8.7
Unemployment, total (% of total labour force) (modelled ILO estimate)	..	..	7.7	4.9	4.7	4.1
Poverty headcount ratio at US\$ 1.90 a day (2011 PPP) (% of population)	..	8.7	..	..	..	0.7 (2016)
Income inequality (Gini coefficient; World Bank estimate)	..	32.4	..	..	..	39.8 (2016)
Personal remittances, received (% of GDP)	3.8	5.0	7.1	7.3	8.7	8.2
Current health expenditure (% of GDP)	..	..	4.1	3.0	3.0	..

Key: GDP: gross domestic product; ILO: International Labour Organization; PPP: purchasing power parity

Source: World Bank, 2018

9.1.2 Political context

The third Constitution of Sri Lanka promulgated in 1978 provided for a unicameral parliament and an Executive President who is the head of State, head of Government and the commander in chief of the Armed Forces. The president heads the Cabinet and appoints ministers from among the members of parliament. The Parliament of Sri Lanka is a 225-member legislature with 196 members elected from 22 multi-seat electoral districts and 29 nominated from a national list (Parliament of the Democratic Socialist Republic of Sri Lanka, 1978).

The 13th amendment to the Constitution (1987) decentralized the administration to nine provinces. Provincial councils are directly elected, the leader of the council's majority party serves as the chief minister. Provincial ministers are elected from among the elected councillors. A provincial governor and a provincial secretary are appointed by the President; the latter heads the provincial administration. Below the provincial level are elected municipal councils and urban councils, responsible for municipalities and cities, respectively, and the Pradeshiya sabhas representing a demarcated cluster of villages (Parliament of the Democratic Socialist Republic of Sri Lanka, 1987).

Sri Lanka's judiciary consists of a Supreme Court – the highest and final superior court, a Court of Appeal, high courts and a number of magistrate courts. The legal framework of the country is derived from the British, Indian and American legal systems, while Kandyan, Muslim and Thesawalami laws are applicable to certain aspects of life and to defined sections of the population.

9.1.3 Natural and human-induced disasters

Sri Lanka is prone to floods, landslides and drought, the past six years witnessing several major incidents affecting thousands of people. The 2004 Indian Ocean Tsunami is reported as the worst natural disaster to affect the country with 35 000 fatalities, 5000 missing persons and financial damage exceeding US\$ 1 billion (Ministry of Disaster Management – Sri Lanka, 2018).

Since Independence, Sri Lanka has experienced three armed conflicts, which impacted the whole country. Two insurgencies originated in the south of the country led by the Janatha Vimukthi Peramuna (JVP). About 60 000 people lost their lives and a considerable number were displaced from their homes although this did not result in a major population migration (Siriwardhana and Wickramage, 2014).

The war with the LTTE, which started in 1983, resulted in more than 100 000 deaths, hundreds of thousands of injured, and led to internal and further external displacement and migration of hundreds of thousands of people (Siriwardhana and Wickramage, 2014).

9.2 Health status and risk factors

9.2.1 Health status

Sri Lanka has been able to achieve a relatively high level of health despite being an LMIC. Table 9.2 shows that life expectancy at birth has been increasing steadily for both sexes, women enjoying 6.7 years of life more than men. Healthy life expectancy at birth also has shown an increase over the years but at a much slower rate than life expectancy, the difference between the two measures increasing over time.

Significant improvements have been made in crude death rates, infant and child mortality rates. The maternal mortality ratio (MMR) continues to decline, though at a slower pace during the past 5 years. The country has been able to eliminate malaria, filariasis, polio and neonatal tetanus (WHO, 2018).

Table 9.2 Sri Lanka: Mortality and health indicators, 1970–2016

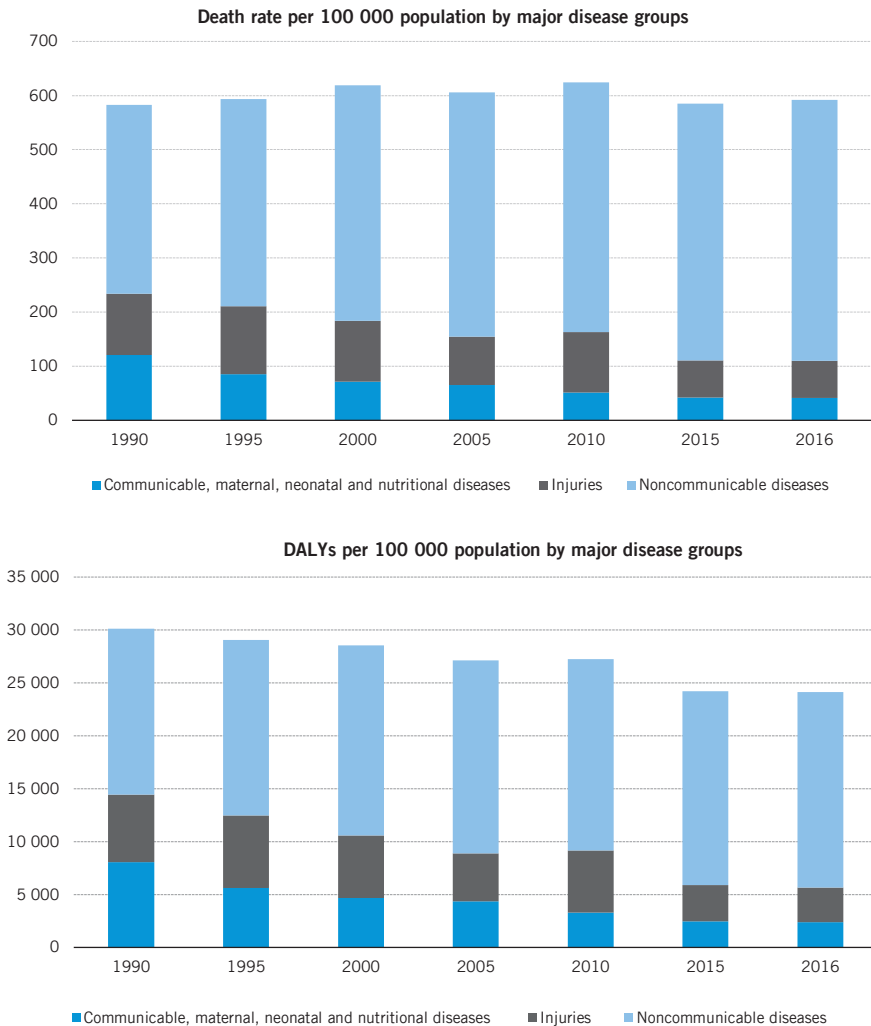
Indicators	1970	1980	1990	2000	2010	2015	2016
Life expectancy at birth, total (years)	64.1	68.2	69.4	71.0	74.4	75.1	75.3
Life expectancy at birth, men (years)	62.4	66.3	66.3	67.5	70.9	71.7	71.9
Life expectancy at birth, women (years)	66.2	70.4	73.2	74.9	77.9	78.4	78.6
Mortality rate, men (per 1000 adult men)	248.3	224.1	258.9	244.8	202.1	198	195.7
Mortality rate, women (per 1000 adult women)	171.4	138.2	120.8	99.9	78.8	74.1	72.9
MMR, modelled estimate (per 100 000 live births)	..	..	75.0	57.0	35.0	30.0	..
IMR per 1000 live births	54.0	39.6	18.1	14.2	10.0	8.2	7.8
Child mortality per 1000 live births (under 5)	71.7	50.1	21.3	16.5	11.6	9.5	9.1

Key: IMR: infant mortality rate; MMR: maternal mortality ratio

Source: World Bank, 2018

Fig. 9.1 shows that NCDs form the bulk of the disease burden and account for the highest deaths per 100 000 population, the next highest being injuries, suggesting that the country is in the late stages of the epidemiological transition. A steady decline in DALYs due to all three categories is noted.

Fig. 9.1 Sri Lanka: Deaths and DALYs per 100 000 population by major disease groups, 1990–2016



Source: Institute for Health Metrics and Evaluation, 2017

Ischaemic heart disease, cerebrovascular diseases and diabetes are the three leading causes of death in Sri Lanka – all three have been increasing since 2005, the highest increase being in diabetes (46.1%). These are followed by Alzheimer disease, asthma and self-harm – Alzheimer showing a 35% increase while the other two have shown a decline. Of the causes of death ranked among the first ten, the highest decrease in the number of deaths is seen for self-harm (17%). Most premature deaths are caused by ischaemic heart disease, self-harm, diabetes, cerebrovascular diseases and road injuries (Institute for Health Metrics and Evaluation, 2018).

Data on hospital deaths (MoH, 2016) show that both in 2010 and 2016, ischaemic heart disease and neoplasms were the two leading causes, accounting for 23.9% and 26.1%, respectively, of all deaths. In 2016, zoonotic and bacterial diseases had a higher proportion of deaths compared to 2010, probably due to the epidemics of H1N1 and dengue/dengue haemorrhagic fever (DHF) seen that year (Table 9.3).

Table 9.3 Sri Lanka: Leading causes of hospital deaths (based on public sector data, 2010 and 2016)

Rank	Condition	2010 %	Condition	2016 %
1	Ischaemic heart disease	12.8	Ischaemic heart disease	14.1
2	Neoplasms	11.1	Neoplasms	12.0
3	Pulmonary heart disease and diseases of the pulmonary circulation	8.7	Zoonotic and other bacterial diseases	11.6
4	Cerebrovascular disease	8.7	Pulmonary heart disease and diseases of the pulmonary circulation	8.7
5	Disease of the respiratory system excluding upper respiratory tract infection (URTI)	7.0	Disease of the respiratory system excluding URTI	8.3
6	Zoonotic and other bacterial diseases	6.6	Cerebrovascular disease	8.2
7	Diseases of the gastrointestinal tract	6.2	Pneumonia	6.4
8	Diseases of the urinary system	5.7	Diseases of the urinary system	6.2
9	Pneumonia	5.2	Diseases of the gastrointestinal tract	5.5
10	Symptoms, signs and abnormal clinical and laboratory findings	5.0	Traumatic injuries	3.9

Source: Ministry of Health, Nutrition and Indigenous Medicine, 2016

In both sexes, ischaemic heart disease and diabetes mellitus are the leading contributors to DALYs, followed by cerebrovascular disease, malignancies and hearing loss among women, while in men the 3rd, 4th and 5th ranks

are taken by cirrhosis, cerebrovascular disease and road injury. These same causes in both men and women have the highest years of life lost (YLLs), suggesting premature loss of life, which has the potential to impact the economic productivity of the country.

Years lost due to disability (YLDs) indicate conditions that people live with and for which services need to be provided. In both sexes, diabetes mellitus and hearing loss have a high number of years lived with disease, while back and neck pain appears to be a problem women endure (Table 9.4).

Table 9.4 Sri Lanka: Leading causes of DALYs by sex, 2016 estimates

Rank	Top ten ranking for men	YLLs (x 1000)	YLDs (x 1000)	DALYs (x 1000)	Top ten ranking for women	YLLs (x 1000)	YLDs (x 1000)	DALYs (x 1000)
1	Ischaemic heart disease	405.2	13.4	418.6	Ischaemic heart disease	241.5	10.1	251.5
2	Diabetes mellitus	129.3	63.8	193.1	Diabetes mellitus	138.5	69.6	208.1
3	Cirrhosis of the liver	173.4	2.1	175.5	Stroke	106.4	20.6	127.0
4	Stroke	148.5	15.9	164.4	Other malignant neoplasms	97.3	0.2	97.4
5	Road injury	115.9	13.5	129.4	Other hearing loss	0	88.4	88.4
6	Other malignant neoplasms	125.2	0.2	125.4	Asthma	62.9	23.3	86.2
7	Self-harm	110.3	1.2	111.5	Alzheimer disease	67.4	16.7	84.2
8	COPD	69.5	38.8	108.3	Back and neck pain	0	69.4	69.4
9	Other hearing loss	0	90.4	90.4	Kidney disease	57.3	10.0	67.3
10	Asthma	66.3	22.1	88.4	COPD	41.1	24.7	65.8

Key: COPD: chronic obstructive pulmonary disease; DALY: disability-adjusted life year; YLD: years lost due to disability; YLL: years of life lost

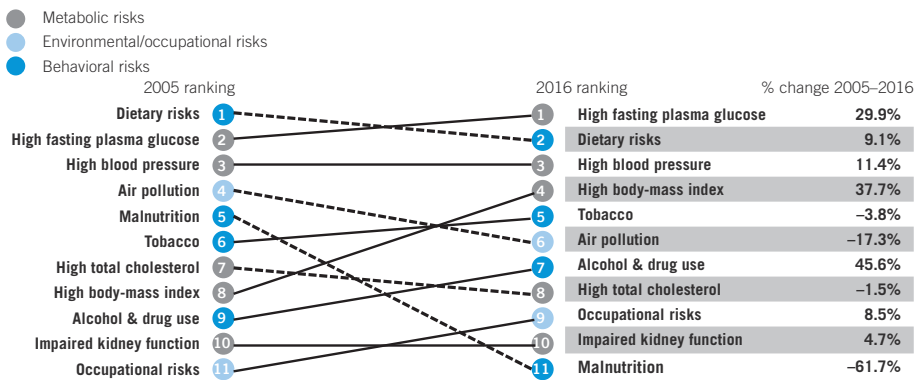
Source: WHO, 2018

9.2.2 Risk factors

The WHO STEPwise approach to surveillance of NCDs (STEPS) in Sri Lanka (WHO, 2015) estimated that 90% of Sri Lankan adults (18–69 years) have at least one of the NCD risk factors, 73.5% have 1–2 risk factors, and 18.3% have 3–5 risk factors), the prevalence being similar among men and women.

Estimates of the Global Burden of Disease (GBD) study (2016) show that the risk factors contributing to the most DALYs in Sri Lanka were high fasting plasma glucose level followed by dietary risks (2nd), high blood pressure (3rd), high BMI (4th) and tobacco use (5th). In comparison with 2005, high fasting plasma glucose level had surpassed dietary risk as the leading risk factor. Alcohol and drug use showed the highest increase (45.6%) followed by high BMI (37.7%) (Institute for Health Metrics and Evaluation, 2018) (Fig. 9.2).

Fig. 9.2 Sri Lanka: Top 10 risks contributing to DALYs and percent change, all ages, 2005 and 2016



Source: Institute for Health Metrics and Evaluation, 2018

It is estimated that tobacco-related illness causes about 20 000 deaths per year in Sri Lanka, i.e. about 15.6% of all deaths (MoH, 2009). According to the STEPS survey 2015, 45.7% of men and 5.3% of women were current users of a tobacco product, most being daily users. Prevalence of current smoking was 29.4% in men, more than two thirds of whom were daily smokers. A little over a third (34.8%) of the men were current alcohol users and 17% of men reported heavy episodic drinking during the 30 days preceding the survey (WHO, 2015). In 2015, it was estimated that the costs of managing alcohol- and tobacco-related illness in the public sector was 21.9% and 16.4%, respectively, of the total health costs in that year (National Authority on Tobacco and Alcohol, 2017; Ranaweera et al., 2018).

Both routine data and surveys (NCD risk factor survey [WHO, 2015], Demographic and Health Survey [DHS] of 2016) highlight the increasing problem of overweight and obesity in the country. The NCD risk factor survey (WHO, 2015) identified that nearly one fourth of the men (24.6%) and one third of the women (34.3%) 18–69 years of age were either overweight or obese (WHO, 2015). The DHS 2015 reported that of the women 15–49 years of age, who were not pregnant and who had not had a birth in the 2 months prior to the survey, 32% were overweight (BMI 25.0–29.9 kg/m²) while 13% were obese (BMI 30 kg/m² or more). Routine data (Ministry of Health, Nutrition and Indigenous Medicine, 2018b) reports show that 21.3% of women who registered for ANC before 12 weeks of pregnancy had a BMI of over 25 kg/m².

Sri Lanka continues to have unacceptable rates of childhood undernutrition. It is well recognized that good nutrition during the first 1000 days of life has lasting health benefits in life and that low birth-weight babies are programmed to be at increased risk of NCDs in later life (Barker, 2007). Prevalence of low birth weight has been fluctuating between 13.3% and 11.4% during the years 2007–2015 (Ministry of Health, Nutrition and Indigenous Medicine, 2018b). The DHS 2016 reported a higher rate of 16.7% among live births in the five years preceding the survey, based on the Child Health and Development Record.

Maternal BMI being a major determinant of low birth weight, it is important to note that undernutrition is also seen among women in the reproductive age group. The Reproductive Health Management Information System (RHMISS) reports that in the period 2009–2015, a fifth to a quarter of women who registered for ANC before 12 weeks had a BMI of less than 18.5 kg/m² (Ministry of Health, Nutrition and Indigenous Medicine, 2018b)

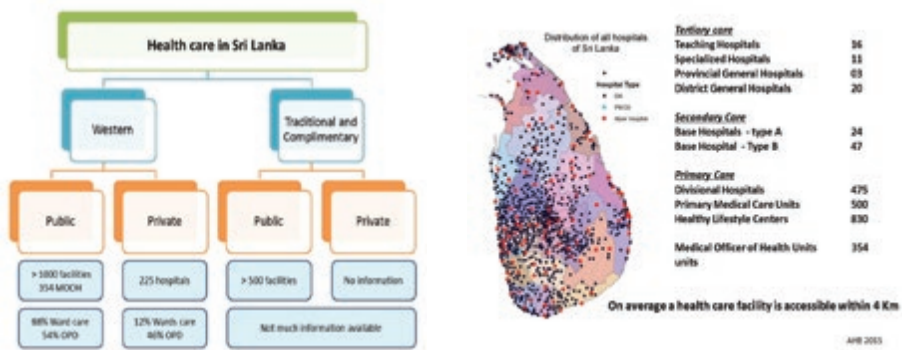
Linear growth retardation in the first 2 years of life and subsequent obesity are known risk factors for NCDs, especially CVDs (Black et al., 2013). The DHS 2015 reported that 17% of children under 5 years of age are stunted, with 4% being severely stunted, 15% are wasted and 21% are underweight. Stunting has remained the same as in the DHS 2006 and it is noted that there are wide inter-district and -sectoral variations in all three measures (Department of Census and Statistics, 2016).

9.3 The health system

9.3.1 Organization and governance

Contemporary Sri Lanka has a pluralistic health system, comprising western allopathic, the four traditional Sri Lankan systems of care, namely: Ayurveda, Siddha, Unani, Deshiya-Chikitsa, as well as Acupuncture. In both systems, health care is provided by the government, private sector and very limited services by non-profit organizations. The traditional systems of care are used by a minority of the population and data are not routinely available (Ministry of Health, Nutrition and Indigenous Medicine, 2016). This section describes the allopathic health services of the country (Fig. 9.3).

Fig. 9.3 Sri Lanka: Organization of the health-care system



Source: Ministry of Health, Nutrition and Indigenous Medicine, 2017 and authors' own data

The country's government health system is recognized as a high-impact, low-cost model that provides all its citizens with moderate-quality services. Comprehensive promotive, preventive and curative services are available through the public sector allopathic services and are spread all over the island. The system is funded by public finances, universally accessible and free of charge at the point of delivery, ensuring equal access to low socioeconomic groups (Smith, 2018). The public sector provides 88% of inpatient care and half of outpatient care, with the private sector providing the remainder of inpatient and outpatient care (Ministry of Health, Nutrition and Indigenous Medicine, 2018a; Withanachchi and Uchida,

2006). An expanding private sector is operating in selected urban settings, complementing the State sector hospitals.

An important change in the system of health-care provision came with the devolution of power to the provinces in 1989, resulting in the establishment of provincial health ministries, provincial and divisional directors of health services and shared responsibilities for the provision of care. Teaching hospitals, specialized hospitals, provincial general and selected district general hospitals are under the central Ministry of Health (MoH), while the rest of the facilities, including preventive health-care services, are under the administrative purview of the provincial health ministries.

The private sector comprises a mix of large hospital groups, small hospitals and private nursing homes, as well as full-time and part-time general practices. Private hospitals are located mainly in urban areas and are staffed by both full-time private doctors and government doctors working in their off-duty hours. Private general practices mainly provide ambulatory care and have wide coverage throughout the island. These are supervised by full-time general practitioners, some of whom are specialists in general practice or by government medical officers working part time. The increase in private sector services has been backed by industry-driven chains of pharmaceutical and laboratory services, as well as small-scale individual-owned laboratories and privately owned pharmacies.

9.3.2 Patient-centredness

Investment in health-care services by successive governments has resulted in increased population coverage; a primary care facility supervised by a qualified medical officer (at least MBBS) being physically accessible within 4 km on average (Ministry of Health, Nutrition and Indigenous Medicine, 2016). Despite the existence of a formal referral system within the structured network of institutions, people are not restricted from accessing specialized care directly at any level of care provision. Although this provides for individual preference, continuity, coordination and integration of care are poorly served. Physical comfort of patients is an aspect that needs considerable improvement within the network of government health-care institutions.

9.3.3 Financing

The public sector health services are financed from the tax revenue, with a very small percentage from international development assistance. The health spending is mostly from the Central Government (Health Economics Cell, 2016) with a small contribution from provincial and local governments. It must be noted that the finances for provincial and local governments also come principally from the Central Government through the finance commission (Ministry of Finance, 2017).

Public expenditure on health care has fluctuated between 2% and 1.66% of the GDP between 2006 and 2015, while the total health expenditure has stagnated at around 3% of the GDP. In 2013, the total health expenditure was estimated to be around US\$ 2 billion, with the public–private contribution ratio being 55:45. Per capita health expenditure was estimated to be US\$ 97 (Health Economics Cell, 2016).

The National Health Accounts for 2013 showed that 91% of health expenditure was utilized by the curative sector and 4.5% by the preventive sector. NCDs accounted for 35% while infectious and parasitic diseases accounted for 22% of the total health expenditure (Health Economics Cell, 2016).

Private health services are funded mostly by out-of-pocket spending by households. The bulk of household spending on health is for fees to private medical practitioners (36%), purchase of medical and pharmaceutical items (24%) and payments to private hospitals and nursing homes (22%). The Household Income and Expenditure Survey (HIES) (2012–13) shows that 5.3% of households spent more than 10% of their total expenditure on health, while 0.9% of households spent more than a quarter of the total expenditure on health care (Hui, Tores and Travis, 2018).

9.3.4 Physical and human resources

The State curative facilities are organized as a tiered structure, each providing a defined level of care. They range from teaching hospitals attached to universities with superspecialties, provincial, district general and base hospitals with selected specialties to divisional hospitals

(outpatient care and inpatient care) and primary medical care units offering only outpatient care. There are also a few specialized hospitals which serve as centres of excellence in the system (Table 9.5).

Table 9.5 Sri Lanka: Numbers and types of government hospitals with associated bed numbers at line ministry and provincial level

Hospital type	Number of hospitals			Bed strength		
	Line ministry	Province	Total	Line ministry	Province	Total
National hospital	1	-	1	3294	-	3294
Teaching hospitals	20	-	20	19 503	-	19 503
Provincial general hospitals	3	-	3	5160	-	5160
District general hospitals	10	9	19	6623	4524	11 147
Base hospitals – type A	5	22	27	1439	7473	8912
Base hospitals – type B	3	49	52	701	7204	7905
Divisional hospitals – type A (>100 beds)	2	61	63	355	5254	5609
Divisional hospitals – type B (50–100 beds)	2	136	138	100	8071	8171
Divisional hospitals – type C (<50 beds)	1	288	289	59	6816	6875
Primary medical care units	1	505	506	0	198	445
Total	48	1070	1118	35 814	39 540	76 781

Source: Ministry of Health, Nutrition and Indigenous Medicine, 2018c

The preventive and promotive arm of the health-care system provides a comprehensive care package at the field level through an island wide network of 354 health units/medical officer of health units. Both domiciliary and clinic-based care is delivered to a geographically defined population by a team of health-care professionals. Health services are mainly focused on maternal and child health (MCH), school health, environmental sanitation, food and water hygiene, and prevention and control of communicable diseases.

Most of the human resource categories in Sri Lanka are trained within the country. The nine medical faculties under the Ministry of Higher Education are responsible for the production of medical, dental and selected paramedical categories supplementary to medicine. The Post Graduate Institute of Medicine, attached to the Faculty of Medicine, University of Colombo, functions as the only postgraduate training facility for the

country. Competitive entry examinations limit the number of candidates admitted for postgraduate training and opportunity to complete publicly funded postdoctoral attachments at identified centres of excellence. Registration by the Sri Lanka Medical Council is mandatory to practise medicine in the country; the Sri Lanka Medical Council functions as the gatekeeper for maintaining the standards of medical practitioners allowed to practise in Sri Lanka.

Institutions under the MoH produce almost all other human resources (nursing officers, pharmacists, laboratory technicians, ECG technicians, midwives, public health inspectors, etc.) for the government sector. Eighteen nurse training schools follow a standard curriculum of three years and produce around 2500 nurses annually. Similarly, there are State-owned training schools for pharmacy, laboratory technology, public health inspectors and public health midwives. Major private hospital groups in Sri Lanka run their own schools for training nurses, which are attached to their hospitals. Despite using accredited training curricula, these training schools are not allowed access to the State facilities nor can their nurses get employment in the public sector.

To improve the coordination of planning, production, deployment and retention of health workers, a human resources for health (HRH) coordination unit was established in 2016. Retaining human resources in rural areas continues to be a challenge in many parts of the country. A structured continuous health professional development system, linked to career development pathways, is needed for all staff categories. While the country prides itself on the vast network of community-based family health workers, re-tooling and re-scaling of front-line health functionaries is needed to address the epidemic of NCDs facing the country. Specific human resource skills in geriatrics, palliative care medicine, rehabilitation care, speech therapy and occupational therapy also need to be developed. Table 9.6 summarizes the available data on health-care worker status in Sri Lanka.

Table 9.6 Sri Lanka: Trends in key health professionals per 100 000 population, 2000–2012

Year	Medical officers	Dental surgeons	Registered/assistant medical officers	Nurses	Public health nurses	Public health inspectors
2000	41.1	3.3	7.0	76.0	1.4	7.7
2005	51.9	4.9	6.5	101.4	1.6	7.7
2010	71.0	5.5	5.4	171.2	1.8	7.0
2012	78.6	6.0	5.6	180.3	1.6	7.5

Source: Yiengprugsawan, Healy and Kendig, 2016

9.3.5 Provision of services

Management of NCDs

Taking into consideration the burden posed by NCDs, the central MoH created a special NCD Bureau in 2016, under a Deputy Director General of Health Services. The Bureau brings together all NCD-related programmes currently carried out by different actors within and outside the MoH, such as the National Authority on Tobacco and Alcohol, Family Health Bureau, Food Control unit, Environment and Occupational Health and the Nutrition Coordination unit of the MoH.

Sri Lanka has endorsed the WHO FCTC and has already incorporated the following measures: increased taxation (some varieties taxed up to 75%), 80% pictorial warnings on packaging, establishment of a tobacco quit help-line and plain packaging of tobacco products by 2019. A traffic light system has been introduced for labelling of sugar content, and a sugar-sweetened beverage tax was also introduced in 2017.

Recognizing the need for special services geared to serve the needs of NCDs, the MoH has established around 900 healthy lifestyle centres covering the entire country. These provide screening for NCDs and risk factors, referral for care, health promotion and behaviour change education. The services provided by Well Women Clinics, which have been in operation within the preventive care sector, have been extended to include NCD and risk factor screening.

As a means of financial risk protection for the population accessing government services for procedures that need special supplies and commodities, efforts have been made to ensure increased supplies within the government system and reduce waiting times for these procedures, thus decreasing the likelihood of patients using the private sector. A list of 18 drugs considered essential for management of NCDs (MoH, 2013) has been published and the supply chain management system within the MoH has been strengthened. In addition, substantial price reductions were made for a list of 48 essential drugs, including drugs commonly used in the treatment of NCDs through a price cap regulation (Parliament of the Democratic Socialist Republic of Sri Lanka, 2015).

A Parliamentary Select Committee was established to examine the alarming increase in road traffic accidents, which resulted in a National Action Plan on Road Safety. The MoH has initiated surveillance of injuries needing admission at sentinel sites with a view to planning measures to reduce resultant mortality and morbidity.

The MoH has endorsed the reorganization of primary health care as the means of improving effective access, quality and continuity of care for the majority of NCDs. This envisages a “shared care cluster system” where a primary health-care institution that serves a defined population is linked to specific higher-level institutions. An essential service package and a service delivery model to provide this care are being developed currently. Improved supply chain management, laboratory service, an improved skill mix and a personalized health record are important components of the envisaged plan (Ministry of Health, Nutrition and Indigenous Medicine, 2018a).

Management of communicable diseases, including emerging diseases

Prevention and control of communicable diseases and emerging diseases come under the Deputy Director General for Public Health Services of the MoH. Vertical programmes function for prevention and control of TB, HIV/STIs, filariasis, leprosy, rabies, dengue and malaria. The Epidemiology Unit established in 1959 functions as the national focal point for disease surveillance.

The country commenced the Expanded Programme on Immunization in 1978. It has periodically added new vaccines to the Programme (measles 1984, measles and rubella, and adult tetanus and diphtheria 2001, hepatitis B 2003 and *Haemophilus influenzae* type B [HiB] 2008) (Epidemiology Unit: Ministry of Health, Nutrition and Indigenous Medicine, 2018). The Programme has achieved near universal coverage and, in 2016, it recorded 99.2% coverage for BCG, 96% coverage for both the triple (DPT–HepB–HiB) and the polio vaccines, and 97.1% coverage for measles (Department of Census and Statistics, 2016).

The HIV prevalence in Sri Lanka is low, at <0.1%, and is concentrated among key population groups. The prevalence of TB has remained stagnant over the past decade and continues to be endemic in several areas, the estimated incidence being 65 per 100 000 population (United Nations Sri Lanka, 2018). The number of patients presenting with multidrug-resistant (MDR)-TB has increased over the years, causing concern (Ministry of Health Nutrition and Indigenous Medicine, 2016). During the year 2017, the country experienced the worst outbreak of Dengue with around 186000 new incidences and around 300 deaths as well as seeing a rise in H1N1 infections which increased mortality and morbidity due to infectious disease. The re-emergence of diseases such as leprosy is noteworthy. Leishmaniasis has gained importance with increasing exposure of populations to the vector. Increasing AMR to commonly used antibiotics is a major concern.

Sri Lanka maintains strict preparedness for pandemic measures and has been able to prevent any serious outbreak from occurring in the country.

Management of MCH

From 1926, Sri Lanka has had a system for delivery of MCH care, which has produced significant gains in terms of infant mortality rate (IMR) (8), neonatal mortality rate (NMR) (5.8), under-5 mortality rate (9.4) and MMR (26.8) (Ministry of Health, Nutrition and Indigenous Medicine, 2016).

However, the rate of decline of these indicators has slowed down in the past decade and has been accompanied by a change in the relative importance of the causes of mortality. Further improvements in the IMR and under-5 mortality rate will depend to a large extent on improvements in perinatal mortality and morbidity. These will necessitate improved coordination

between field and institutional services, re-tooling of the skill mix of human resources, multidisciplinary care teams, highly specialized facilities and improvement in quality of care, all needing substantial financial investments (Family Health Bureau: Ministry of Health, 2015; Rajapaksa et al., 2014).

9.4 Performance of the health system

9.4.1 Effectiveness and quality

Sri Lanka is acknowledged as a country that has an effective, equitable, low-cost health-care system (Smith, 2018). Health outcomes are better than those in many countries in the region and countries with a comparable income (World Bank, 2018). Data from the GBD project have been used to develop a health-care access and quality index using 30 cause-specific mortality rates for 30 conditions. Sri Lanka has a score of 72.8 out of a possible 100, an improvement from the 1990 figure of 56.9. The current figure is better than that of most of the neighbouring countries such as Indonesia, Malaysia and Thailand (Barber et al., 2017). The SDG Index calculated using 37 of the 50 SDGs is a proxy measure of the overall effectiveness of the health-care system. Sri Lanka, with a score of 62 out of 100, ranks 70th out of 188 countries, Malaysia and Maldives are ranked higher than Sri Lanka, while other countries in the region are ranked below Sri Lanka. In respect of this Index too, the country has shown progress from a score of 38 in 1990 to the current score (Fullman et al., 2017).

A National Health Performance Framework – a framework for monitoring the performance of the State health system – has been adopted. Financial allocation, service provision and service utilization are documented regularly and are published online. Health coverage indicators, health conditions and risk factor survey reports are also made available and are accessible to the general public.

The State has endorsed the SDG framework and keeps track of 46 health-related indicators nationally and at the subnational level. An SDG tracker for Sri Lanka is available online (United Nations Sri Lanka, 2018) with free access. However, a culture of accessing these statistics is not evident in the general population.

The quality of outpatient primary care in Sri Lanka is generally considered high for an LMIC. The quality of care in the public sector was seen to be better than that in the private sector in many areas, despite financial constraints (Rannan-Eliya et al., 2015a). Studies have shown that the quality of diagnosis and management aspects of care in the public sector is similar to that of the private sector. However, the private sector allows patients a choice of providers and better quality care in non-clinical areas (Rannan-Eliya et al., 2015b).

Russel and Gilson (2006) studying an urban population in Sri Lanka found that, irrespective of income group, people relied on the government sector for technical competence, especially in receiving inpatient care. But service providers in the government sector were found to lack soft skills and interpersonal skills so that high-income people and even a considerable proportion of middle-income ones opted to seek care in the private sector for moderate illnesses. Similarly, children with high-risk symptoms were taken to government sector institutions whereas children with low-risk symptoms were taken to the private sector.

9.4.2 Accessibility

The State provides access to a health-care facility within 4 km of the population. Each district has at least one tertiary care facility and one secondary care facility. Emergency care is provided at all facilities. Specialized care is made available at the secondary and tertiary levels of care. Despite having comprehensive care in each district, many services are seen to be inequitably distributed (Ministry of Health, Nutrition and Indigenous Medicine, 2016).

In spite of the geographical dispersion of facilities, the rate of utilization is poor among the working population (Ministry of Health, Nutrition and Indigenous Medicine, 2016). The STEPS survey identified that a third of the adult population had never been screened for hypertension, as was the case for diabetes (WHO, 2015). This is attributed to limited service availability during time periods convenient to the working population.

9.4.3 Resilience

The Sri Lankan population is ageing fast. Around 75% of the current disease burden is attributed to NCDs. Deficiencies in the current system in addressing NCDs and the needs of the elderly have been identified for reorganization. Reorganization of primary care to address this emerging burden and to improve access to quality care for the entire population is being planned. The strengths and successes of the current field health services of the preventive sector will be harmonized to develop a suitable service delivery model for the primary health care curative system.

Inadequate tax revenues and government debt have limited further allocations for health. Low spending on health by the State is coupled with issues in continuous financial flows and public financial management. The Inland Revenue Act, 24 of 2017, in effect from 1 April 2018, was introduced by the government to increase the tax revenue of the country. Increasing tax revenues needs to be complemented with identification of additional financing mechanisms such as earmarked taxes from alcohol, tobacco and sugar-sweetened beverages, and increasing recovery from insurance for increasing the health budget. Revisiting the public financial management system as well as addressing inefficiencies will be critical for sustaining and increasing the resources for health.

The medical officer of Health units focusing on MCH care, the curative care facilities providing outpatient and inpatient care, as well as the TB, STI, filariasis, malaria and leprosy programmes are designed vertically with varied levels of functional integration. Most of these programmes have their own budget lines, own cadres of medical officers and support staff. The reorganization envisages an integrated system to improve efficiency.

The State employs around 141 000 health-care workers. The HRH coordination unit of the MoH coordinates the recruitment, training, deployment and planning of all human resources. All State employees are entitled to a pension, medical schemes and subsidized State-sponsored loans. Some of the higher grade professionals are entitled to additional allowances (communication and research), State-funded postgraduate education and vehicle permits with a duty concession. Periodic compulsory transfer schemes, which allow the possibility of shifting to better work settings with increasing seniority, have contributed to the continuous

retention of human resources in difficult stations. Having the opportunity to enhance incomes through private practice during off-duty hours has facilitated rural retention and minimized brain drain.

9.5 Conclusions

Future developments

The MoH has identified the reorganization of primary health care as the means of achieving UHC and specifically as a means of addressing the growing burden of NCDs. Towards this end, it has formulated a strategic plan that will drive the provision of health-care services in the coming years (Ministry of Health, Nutrition and Indigenous Medicine, 2018a). These planned programmes would underpin the progress Sri Lanka has made in addressing the issues of equity and social determinants of health.

This strategic plan will consist of a package of essential services focused on the management of NCDs in the community, linking curative, preventive and promotive services, and would ensure patient-centred continuity of care. The reforms envisage the incorporation of new technology into the health-care system in a judicious and equitable manner.

The first step in the planned reforms would be a redefinition of primary care institutions with empanelling of populations to each institution and the identification of a practicable referral system. It would also include the rationalization of human resources with a skill mix necessary for optimum service delivery at each level. These would be complemented by ancillary services and essential supplies.

An individualized patient record system would form an integral part of the envisaged reorganization. Each person will be provided a secure smart health card, which will contain personal health information accessible at both public and private health-care delivery points. This would further strengthen the synergies between the private and public sectors and facilitate continuity of care. The patient information system would be synchronized with institutional as well as disease notification and surveillance systems.

An important arm of the reforms envisages building on the health literacy of the populations to engage and empower individuals to take more responsibility for their own health and to leverage technological advances and innovations for this purpose.

The health emergency preparedness and response system and the capacity of the health system to respond to health issues arising due to climate change would be further strengthened.

Challenges

Although the country has made remarkable progress over the years, particularly in the fields of communicable diseases and MCH, the system has not evolved appropriately to meet the changing demands of the demographic and epidemiological transition. Hence, the health services of Sri Lanka would continue to be challenged by the rapidly ageing population and the changing disease burden.

Furthermore, the MCH statistics indicate stagnation over the past decade, associated with changes in the causes of mortality. The current MCH strategies need to be re-examined to address these challenges.

While the health system has been able to deliver a set of essential services in an equitable fashion, maintaining equity while improving the quality of services to meet client expectations and satisfaction remains a challenge.

The present structure for delivery of care is fragmented into functional silos. Although this has produced the desired results in the past, a more integrated approach to service delivery is needed to address the emerging challenges. Given the financial limitations, another challenge would be to reorient the system so that human and other resources function in a synchronized manner with optimal productivity.

Sri Lanka has been delivering good health care at low cost; however, further incremental improvements will necessitate further substantial investments. Improving the health of the population entails addressing equity in social and economic policies, the environment and personal behaviours of the people in an integrated and comprehensive manner, rather than a narrow focus on delivery of health services. The challenge is in accomplishing this.

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Chapter 10. Thailand

Walaiporn Patcharanarumol, Suladda Pongutta, Woranan Witthayapipopsakul, Shaheda Viriyathorn, and Viroj Tangcharoensathien



Many parts of this mini-HiT chapter are excerpted from the chapters' summary and contents of *Thailand Health Systems in Transition 2015* with some modification and update of data. A major contribution was made by the late Dr Pongpisut Jongudomsuk, who was an author of the *Thailand HiT 2015*.

10.1 Introduction

Thailand, a founding member of ASEAN, is at the centre of the Indochina peninsula and is bordered by Cambodia, Lao People's Democratic Republic, Malaysia and Myanmar. Thailand's population in 2017 was 68.9 million with 96% being of Thai ethnicity. The country's official language is Thai and 93% of the population is Buddhist. As of 2011, there were approximately 3.5 million migrants (Tangcharoensathien, Thwin and Patcharanarumol, 2017) residing in the country. The adult literacy rate is high at 93.5% with a small gender gap – men 95.6% and women 91.5%.

10.1.1 Economic context

Thailand has been one of the fastest-growing economies in Asia and in South-East Asia. It experienced rapid growth between 1985 and 1996, and is presently a newly industrialized country and a major exporter. Thailand faced the Asian financial crisis in 1997 and subsequently took 10 years to recover from the crisis; the gross national income (GNI) per capita in 2006 was equal to that in 1997. Thailand has become an upper-middle-income country since 2011 and its GNI per capita was at US\$ 5640 in 2016 (World Bank, 2018a).

When the ASEAN Economic Community emerged in 2015 to integrate the regional economies for better competitiveness with the rest of the world, Thailand was less competitive than other ASEAN members, such as Cambodia, Lao People's Democratic Republic and Viet Nam, especially on labour costs. However, the size of the labour force in Thailand has been steadily increasing. The number of registered unemployed reduced to 1.3% in 2005. Although the unemployment rate in Thailand is reported at less than 1% and despite favourable economic growth, income distribution has not improved much with the Gini index at 45.3 in 1990 and 39.4 in 2010 (World Bank, 2018a).

The Government of Thailand is moving the country to "Thailand 4.0", which could help the country escape the middle-income trap and growing disparities. Thailand is adopting various measures to shift from a production-based to a service-based economy, moving from producing commodities to innovative products, emphasizing promotion of technology, creativity and innovation in selected industries (Royal Thai Embassy, n.d.).

Table 10.1 Thailand: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	47.4	56.6	63.0	67.2	68.7	69.0
Population density (people per sq.km of land area)	92.8	110.8	123.2	131.6	134.4	135.1
Population growth (annual %)	2.1	1.4	1.0	0.5	0.4	0.3
Population ages 65 and above (% of total)	3.7	4.5	6.5	8.9	10.6	11.4
Age dependency ratio, old (% of working-age population)	6.6	6.9	9.4	12.4	14.8	15.9
Age dependency ratio, young (% of working-age population)	69.4	46.3	34.5	26.7	25.2	24.3
GDP (current US\$, billions)	32.4	85.3	126.4	341.1	401.4	455.2
GDP per capita (current US\$)	682.8	1508.3	2007.6	5075.3	5846.4	6593.8
GDP growth (annual %)	5.2	11.2	4.5	7.5	3.0	3.9
Gross national expenditure (% of GDP)	106.3	107.5	91.6	94.3	88.5	85.4 (2016)
Tax revenue (% of GDP)	13.1	16.9	13.0	14.9	16.0	15.5 (2016)
Central Government debt, total (% of GDP)	..	18.4	22.0	26.9	35.3	..
Industry, value added (% of GDP)	28.7	37.2	36.8	40.0	36.2	35.0
Agriculture, forestry and fishing, value added (% of GDP)	23.2	12.5	8.5	10.5	9.0	8.7
Services, value added (% of GDP)	..	..	54.7	49.5	54.8	56.3
Labour force, total (in millions)		29.9	35.14	39.3	38.89	39.14
Unemployment, total (% of total labour force) (modelled ILO estimate)	..	..	2.4	0.6	0.6	1.1
Poverty headcount ratio at \$1.90 a day (2011 purchasing power parity) (% of population)	..	9.4	2.5	0.1	0	..
Income inequality (Gini coefficient; World Bank estimate)	..	45.3	42.8	39.4	36.0	..
Personal remittances, received (% of GDP)	1.2	1.1	1.3	1.3	1.5	1.5
Current health expenditure (% of GDP)	..	..	3.2	3.6	3.8	..

Key: GDP: gross domestic product; ILO: International Labour Organization; PPP: purchasing power parity

Source: World Bank, 2018a

10.1.2 Political context

Thailand's first Constitution was endorsed in 1932, immediately after the democratic revolution that transformed Thailand from an absolute to a constitutional monarchy. Since then, there have been eighteen charters or constitutions, reflecting a high degree of political instability with frequent military takeovers. There have been eight coups d'état and 12 rebellions. Thailand has a multiparty system; it usually has a multiparty coalition government. The current military government has been in power since 2014.

According to the Constitution, the three independent and counterbalanced powers are executive, legislative and judicial. The King under the Constitution is a symbol of national identity and unity. The late King Bhumibol commanded a great deal of respect and moral authority among the population to resolve various political crises.

According to the worldwide governance indicators, political stability has deteriorated, with the percentile rank down from 65 in 2000 to 16 in 2016 (indicates the rank of a country among all countries in the world). The ranking for control of corruption has declined from 51 in 2000 to 40 in 2016. The ranking of its effectiveness increased only from 63 to 66 during the same period³ (World Bank, 2018c).

10.1.3 Natural and human-induced disasters

Between 1994 to 2015, the top three natural disasters in Thailand in terms of frequency were floods, storms and drought, while in terms of total deaths were earthquakes, floods and storms (UN Office for Disaster Risk Reduction, n.d.). The Indian Ocean tsunami hit the west coast of southern Thailand in December 2004, resulting in 4812 confirmed deaths, 8458 injuries and 4499 persons missing. One of the most severe and long periods of flooding happened between July 2011 and January 2012; affecting 65 out of the 76 provinces and resulting in 815 confirmed deaths, damage to 21 000 sq.km of farmland and an estimated economic loss of 1425 billion baht. Drought has also occasionally had a serious impact; the April 2008 and

³ 0 corresponds to the lowest rank, 100 corresponds to the highest rank.

March 2010 draughts affected approximately 10 million and 6.48 million people, respectively.

Human-induced disasters occur periodically. In October 2004, a massive explosion at a fireworks factory in the ancient Thai capital of Ayuthaya killed 14 people. The factory was operating illegally. In May 2006, eight people were killed and 56 were injured in a fire at a nightclub in a resort in Pattaya. The fire broke out shortly before the club was to open. All the victims were Thai and most of them worked at the club. In January 2009, 66 people were killed and more than 200 were injured in a fire at the upscale Santika nightclub in Bangkok on New Year's Day. Police charged the singer of a pop group called Burn with negligence for lighting fireworks that set off the fire (Hays, 2014).

10.2 Health status and risk factors

10.2.1 Health status

Life expectancy

The overall health status of Thai people has improved over the years. During the period 1990–2016, the world development indicators (World Bank, 2018a) show increasing life expectancy at birth from 67.2 to 71.6 years for men and 73.4 to 79.1 years for women. During the same period, the adult mortality rate for men and women decreased overall, although there was an increase in mortality among men during 1990–2000 due to HIV/AIDS. World Health Organization reports that, in 2016, Thailand's healthy life expectancy at birth was 66.8 years; 64.0 for men and 69.8 years for women (WHO, 2018a). Thailand is fast becoming an ageing society as the percentage of the population aged 60 years and above reached 15.8% in 2015 and is projected to reach 26.9% in 2030 (UN Department of Economic and Social Affairs, Population Division, 2015).

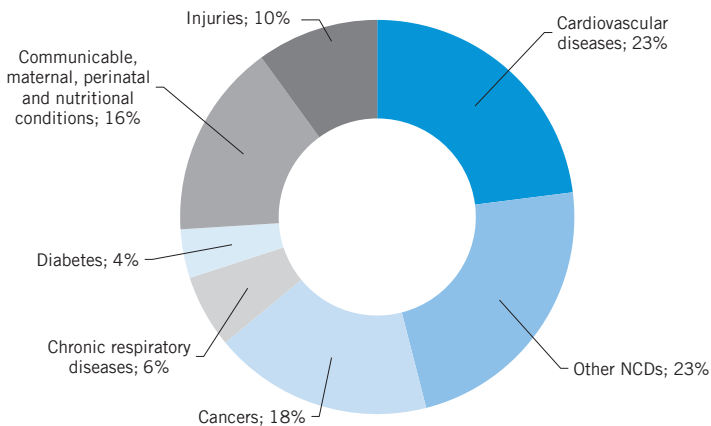
Table 10.2 Thailand: Life expectancy at birth and adult mortality rate, 1990–2016

Indicators	1990	1995	2000	2005	2010	2016
Life expectancy at birth (in years)						
Total	70.2	70.2	70.6	72.1	73.9	75.3
Male	67.2	66.6	66.9	68.8	70.4	71.6
Female	73.4	74	74.5	75.3	77.6	79.1
Fertility rate, total (births per woman)	2.1	1.9	1.7	1.6	1.5	1.4
Birth rate, crude (per 1000 people)	19.2	16.9	14.5	12.9	11.8	10.3
Death rate, crude (per 1000 people)	5.7	6.3	6.8	7.1	7.3	7.8
Adult mortality rate						
Male (per 1000 male adults)	227.6	253.7	257.7	234.4	215.5	201.7
Female (per 1000 female adults)	135.5	135.1	137.1	124.3	104.8	92.5

Source: World Bank, 2018a

Main causes of death

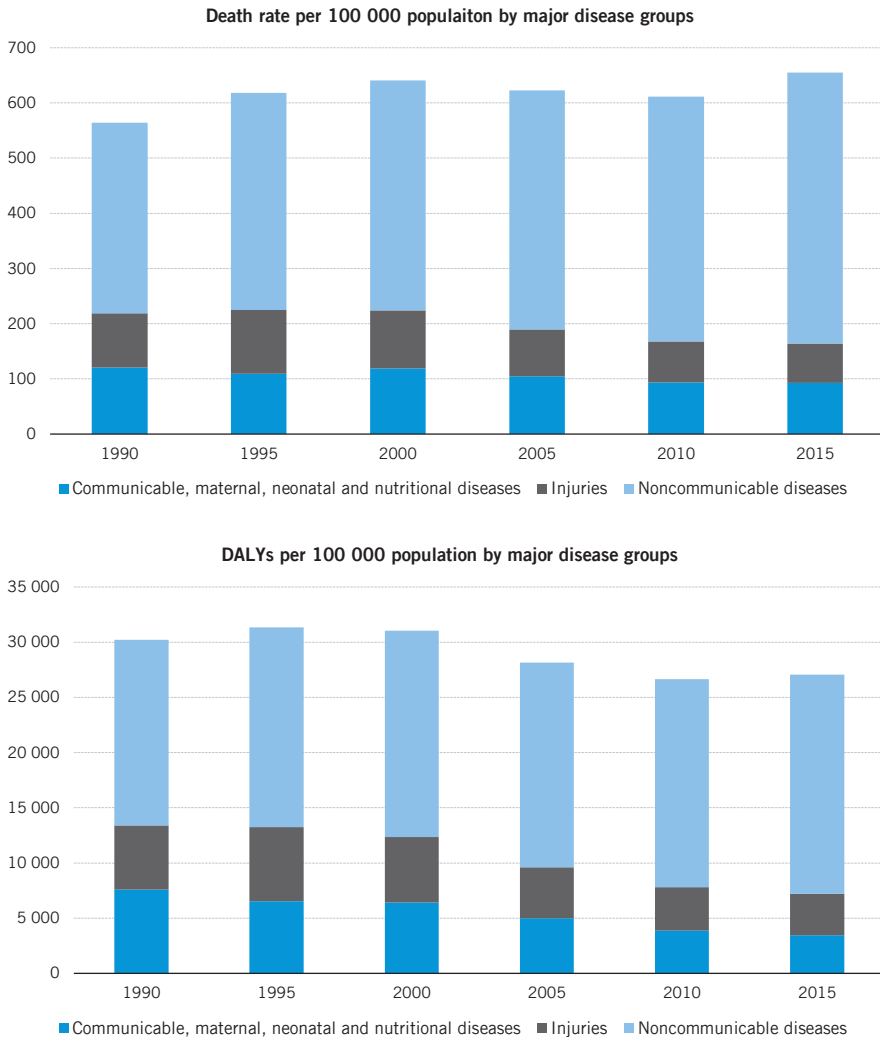
WHO reports a total number of about 539 000 deaths in Thailand in 2016 and NCDs are estimated to account for 74% of the total deaths (WHO, 2018b) (Fig. 10.1).

Fig. 10.1 Thailand: Proportional mortality (% of total deaths, all ages, both sexes) by cause, 2016

Source: WHO, 2018b

This ratio has been stable for the past 25 years although slowly a rise in total death rates can be seen as the country is ageing, and a slow shift in causes of death, with injuries becoming the second cause of DALYs (Fig. 10.2).

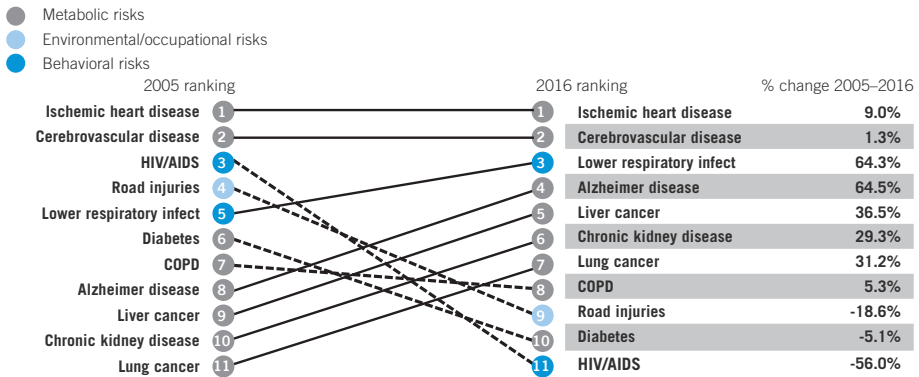
Fig. 10.2 Thailand: Deaths and DALYs per 100 000 populations by major disease groups, 1990–2015



Source: Institute for Health Metrics and Evaluation, 2017

HIV/AIDS contributed to a stagnation in reduction of the mortality due to infectious diseases until universal access to ART was launched in 2004 (Aungkulanon et al., 2012). HIV/AIDS was still the main cause of death in Thailand in 2005 but it was the eleventh rank in 2016, with -56.0% change between 2005 and 2016 (Institute for Health Metrics and Evaluation, 2018) (Fig. 10.3).

Fig. 10.3 Thailand: Top 10 causes of death and percent change, all ages, 2005 and 2016



Source: Institute for Health Metrics and Evaluation, 2018

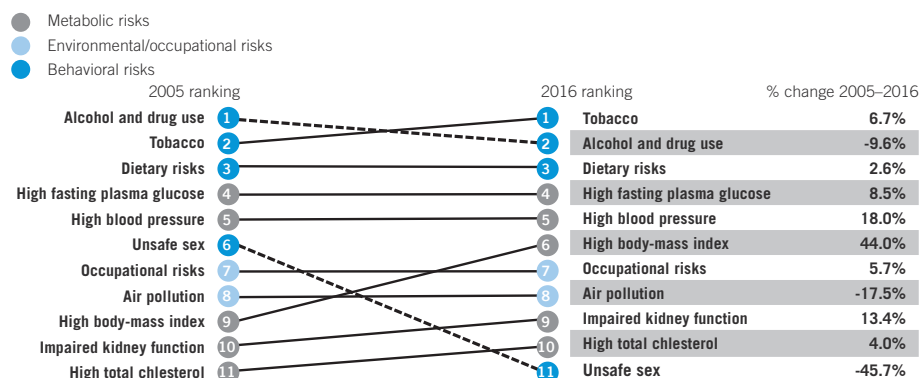
The Institute for Health Metrics and Evaluation (2018) identified the top 10 causes of DALYs in Thailand compared to other countries relative to the group average based on the regional classification of the Global Burden of Disease, known trade partnership and sociodemographic indicators. Road injuries are the most serious problem contributing to DALYs, despite active policies to curb traffic injuries and mortality, such as the national speed limit law, drink-driving law, motorcycle helmet law and seat-belt law; however, law enforcement was not effective at the score of only 3, 6, 6 and 6, respectively (0 minimum and 10 maximum) (WHO Regional Office for South-East Asia, 2015).

10.2.2 Risk factors

During 2005–2016, risk factors continued to be the same. Alcohol and drug use, tobacco and dietary habits were the top three behavioural risks contributing to DALYs while high fasting plasma glucose and high blood

pressure were the top fourth and fifth. Notably, high BMI shifted from the ninth up to the sixth rank (Fig. 10.4).

Fig. 10.4 Thailand: Top 10 risks contributing to DALYs and percent change, all ages, 2005 and 2016



Source: Institute for Health Metrics and Evaluation, 2018

Table 10.3 presents the risk factors of Thai adults. Alcohol consumption, tobacco smoking and adult obesity are higher in men than women, while Thai women are less active than men (WHO, 2018b). Although Thailand has tried many policies and strategies to fight tobacco use, the prevalence of adult smoking has stagnated at around 20%.

Table 10.3 Thailand: Prevalence of adult risk factors by sex

Indicators	Males	Females	Total
Alcohol per capita consumption, in litres of pure alcohol (2016)	14	3	8
Tobacco smoking (2016)	40%	2%	21%
Raised blood pressure (2015)	26%	24%	25%
Adult obesity (2016)	12%	7%	10%
Physical inactivity (2016)	23%	28%	25%

Source: WHO, 2018b

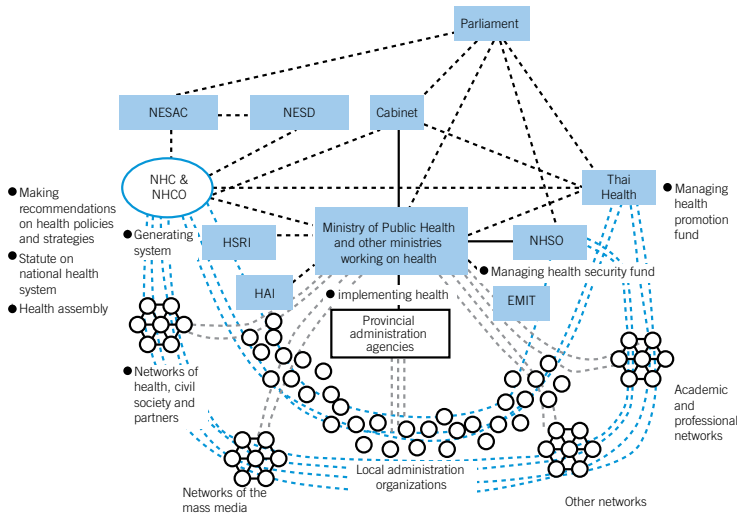
10.3 The health system

10.3.1 Organization and governance

The Ministry of Public Health (MoPH) is the national health authority responsible for formulating, implementing and monitoring health policies. Over the years, the role of the MoPH has changed, as several semi-autonomous and autonomous health agencies have been established by legislation. These include the Health Systems Research Institute (1992), Healthcare Accreditation Institute (1999), the Thai Health Promotion Foundation (2001), the National Health Security Office (2002) and the National Health Commission Office (2007).

The MoPH and these independent agencies work together and form a complex interdependent governing structure (Fig. 10.5). In addition, non-State actors and civic groups are actively involved in health through

Fig. 10.5 Thailand: Linkages of governance mechanisms in the national health system



Key: NESDB: National Economic and Social Development Board; NHSO: National Health Security Office; NHC: National Health Commission; NHCO: National Health Commission Office; ThaiHealth: Thai Health Promotion Foundation; HSRI: Health Systems Research Institute; EMIT: Emergency Medical Institute of Thailand

Note: Solid lines refer to the line of command, reporting and direct accountability, while dotted lines depict intersectoral coordination.

Source: Wibulpolprasert, 2011

various approaches. By law, the National Health Commission Office is mandated to convene an annual National Health Assembly (NHA), ensuring active participation by all governments, nongovernments and people in formulating health policy through deliberations during the NHA, and finally through NHA Resolutions.

The advent of the National Health Security Office (NHSO) has had a major impact in transforming the integrated model of the MoPH as both the purchaser and service provider, to NHSO as the purchaser and MoPH as the service provider.

Thailand has a long history of decentralization of health management to the provincial health offices (PHOs). All public hospitals under the MoPH have the financial power to retain and use revenue according to regulations, subject to a regular audit by the auditor-general. The PHO also holds regulatory power, such as issuance of new licences or renewal of annual licences of private pharmacies and private clinics, and consumer protection on food, drugs and cosmetics in the respective provinces.

The Decentralization Act, 1999 requested the MoPH to devolve all public health facilities to the local elected government units, i.e. health centres to tambon (subdistrict) administration organizations (TAOs), district hospitals to municipalities and provincial hospitals to provincial administration organizations. Progress in implementing the Decentralization Act has been slow, only 51 health centres out of a total of 9762 (0.52%) have been devolved and only one MoPH district hospital is an autonomous hospital.

Multiple factors contributed to the non-progress in devolving health centres to TAOs, such as shift in the Central Government priority, readiness of the MoPH to devolve authority to TAOs and, at the same time, the readiness of TAOs to take on the responsibility of health centres and health-related issues (Kulthanmanusorn et al., 2017). In practice, the current integrated model of primary health care consisting of health centres and district hospital can contribute to equitable access and efficiency of health systems. In pursuing this shift, what is not clear is the underlying cause for change: what is wrong with the current situation? Why is there a need to devolve all health centres to more than 5000 TAOs and all district hospitals to municipalities? How will the people benefit? And what is the value added due to such decentralization?

10.3.2 Patient-centredness

The extensive geographical coverage of primary health care and hospital services with proper referral mechanisms (both refer up and down) that patients are able to access and use of health services is the foundation for patient-centredness in Thailand.

Box 10.1 Thailand: Declaration of Patient Rights⁴

1. The right to use essential health services without discrimination by social status, race, nationality, religion and other factors.
2. The right to get adequate information before obtaining a health service and the right to consent or refuse treatment except in the case of an emergency or life-threatening situation.
3. The right to get urgent attention and immediate relief in the case of critical conditions or near death, regardless of the patient's requests or no request for assistance.
4. The right to know the full name and family name and specialty of the health-care provider who provides health service to them.
5. The right to request a second opinion and opt for another health-care provider.
6. The right to request that their personal health information shall be kept confidential and the only exception being with the consent of patient or due to legal obligation.
7. The right to demand complete information regarding their role as subjects in research and the associated risk, in order to make an informed decision to participate in, or withdraw from, the research carried out by the health-care provider.
8. The right to know and demand the full and current information about their medical treatment as in the medical record as requested.
9. The father/mother or legal representative may use their rights on behalf of a child under the age of 18 years or who is physically or mentally disadvantaged due to which they could not exercise their rights.

“Patient rights” are guaranteed by several mechanisms. Access to essential health services has been considered as a basic right since the promulgation of the Thai Constitution in 1997. Professional organizations, including the Medical Council, the Nursing and Midwifery Council, the Pharmacy Council and the Dental Council have adopted the “Declaration of Patient Rights” (Box 10.1) since 1998 and request all health-care providers to ensure

⁴ This is an unofficial translation of the Declaration of Patient Rights.

that patient rights are fully observed in their clinical and professional practices. The Declaration of Patient Rights is posted publicly at every place that provides health care.

10.3.3 Financing

Since 2002, Thailand has achieved UHC for the Thai citizens, provided by three public health insurance schemes. Civil servants and their dependents are covered by the Civil Servant Medical Benefit Scheme (CSMBS); private sector employees are covered by the Social Health Insurance (SHI) Scheme and the rest of the population by Universal Coverage Scheme (UCS). These three public health insurance schemes are managed by three different agencies, namely, the Ministry of Finance, Ministry of Labour and NHSO, respectively, which resulted in a purchaser–provider split. A combination of provider payment methods is applied. Closed-ended provider payments, using a combination of capitation and Diagnostic Related Group (DRG) play a dominant role, notably, capitation for outpatient payment is applied by the SHI and UCS, while fee for service is used by the CSMBS outpatient payment. DRG use for inpatient payment was widely applied by the CSMBS and UCS though with some variations, and partially applied by the SHI. Private health insurance comprises an insignificant proportion as people could pay for it on a voluntary basis on top of the three main public health insurance schemes.

Thailand has about 3.5 million migrant workers, as estimated in 2011. Less than 9% of them are covered by the SHI scheme, while in 2016, about 33.7% (or 1.1 million) were covered by the voluntary migrant health insurance scheme managed by the MoPH. Thailand still needs to scale up the coverage of voluntary migrant health insurance as well as migrant-friendly services (Tangcharoensathien, Thwin and Patcharanarumol, 2017).

The current health expenditure was about 3.1% of the GDP during 2001 and increased to 3.77% of the GDP in 2015. Public expenditure on health has gradually increased from 56% in 2001 to 77% of the current health expenditure in 2015. At the same time, out-of-pocket expenditure reduced from 33.1% to 11.7% during the same period. The major sources of funds are from general tax; followed by direct out-of-pocket payment, premiums

of SHI and private insurance. External sources were insignificant, at 0.3% of the current health expenditure in 2015 (World Bank, 2018a).

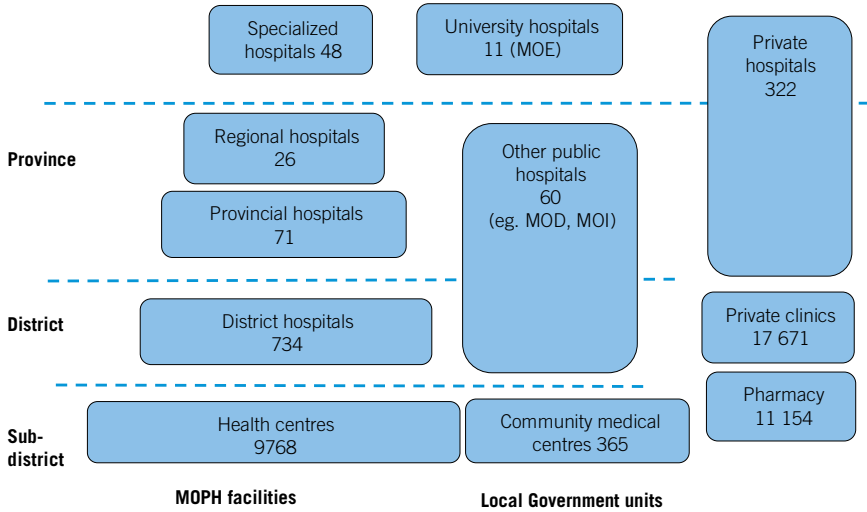
There was a significant increase in general government health expenditure from 11% to 13% in 2001–2003, which increased to 16.6% in 2015. At about 70%, curative expenditure dominates total health spending, of which 30% is utilized for inpatient services and 40% for outpatient services. Expenditure for prevention and public health services was a small proportion of the overall health expenses (National Health Accounts Working Team, 2017).

Thailand legislated an earmarked sin tax of 2% additional surcharge on tobacco and alcohol excise duty since 2001. This is pooled and managed by the Thai Health Promotion Foundation for health promotion activities, mainly to deal with key health risks such as alcohol and tobacco use, HIV/AIDS, NCD and road safety.

10.3.4 Physical and human resources

Since 1980, the Thai Government has had a high political commitment to invest in health infrastructure and expand health facilities to all areas in Thailand. Every subdistrict (tambon) has at least one health centre covering an average of 5000 people and every district has a district hospital, with a range of 30–120 hospital beds, covering an average of 50 000 people in a district. The district hospital and all health centres in a district collectively work as a network of the district health system. Every province has a provincial hospital with a range of 150 to more than 1000 beds. A regional hospital acts as a referral hub for many provincial hospitals in the region (Fig. 10.6). The health delivery system in Thailand is dominated by public health facilities; only 21% of total beds are in private hospitals. More than two thirds of the total private hospitals have less than 100 beds. Private hospitals with more than 100 beds are located in urban areas. Some of them are registered in the stock market and provide services to international patients in Bangkok. The widespread availability of public health facilities throughout the country and, importantly, the linkage among them has acted as a prerequisite for the implementation of UHC.

Fig. 10.6 Thailand: Number of healthcare facilities, 2015



Key: MOE: Ministry of Education; MOD: Ministry of Defence; MOI: Ministry of Interior; MOPH: Ministry of Public Health

Source: By the authors

In parallel with the expansion of health infrastructure, the required health workforce could be produced domestically; with the quality being guaranteed through use of standard curriculums, and national licensing examinations of all health cadres. In 2015, Thailand had 2.8 physicians, nurses and midwives per 1000 population (World Bank, 2018b), slightly higher than the 2.28 minimum threshold required by WHO (2006). In addition, the Government has made various policy interventions for retention of the rural health workforce in public health facilities, such as the recruitment of local students for local training and local placement, especially for mandatory government rural services of all new health professional graduates. Both financial and non-financial incentives are offered, for example, special allowances for those who work in rural areas, free housing, and social recognition of the best rural doctor award every year.

High geographical coverage of functioning primary health care with adequate numbers of a competent health workforce made the rapid rolling out of UHC in 2001–2002 successful without additional government investment in public health infrastructure and workforce. However, the public sector reform in 2002 resulted in a freeze in the number of staff in the public sector with abolishment of all posts that became vacant due to retirement. The health sector was also impacted by the negative consequences of this downsizing policy. The mandatory postgraduation requirement to join government service for nurses and pharmacists was terminated since there were no posts available in public hospitals and the graduates were on short-term contracts in public hospitals. This created job uncertainty and offered no incentive for them to remain in public hospitals. Currently, only doctors and dentists are obligated to do mandatory rural service after graduation. Presently, the Government still meets the demand for new nursing posts on an ad-hoc basis.

Apart from health professionals, there are more than 1 million village health volunteers who support health activities in communities throughout the country. They have made a significant contribution to the management of NCDs (Treerutkuarkul, 2008).

10.3.5 Provision of services

The Thai health delivery system is multidimensional and aims to improve geographical access to the population and enhance the efficiency of the health system. Health centres and district hospitals, together with provincial hospitals distributed throughout the country, are crucial for providing essential health services to the people. The name “health centre” in Thailand has been changed to “Subdistrict Health Promotion Hospital” to emphasize health promotion activities, including a focus on disease prevention, such as screening for diabetes mellitus, hypertension and cervical cancer.

Specialized health services and high-cost interventions are improved in several public health facilities under the management of UCS to ensure equitable access for beneficiaries of the UCS. Examples include ART for patients with HIV/AIDS, open-heart surgery, renal replacement therapy for all peritoneal dialysis, haemodialysis and kidney transplant. Public

hospitals are encouraged to meet the hospital accreditation requirement provided by the independent Healthcare Accreditation Institute.

Although much has been done, there is still room for considerable improvement, particularly in the areas of mental health care, palliative care, long-term and intermediate care to meet the demands of an ageing society and concomitant increase in NCDs.

Management of NCDs

Curative services for NCDs are covered under each public health insurance scheme. The basic prevention of NCDs, e.g. screening and health promotion services, are covered for all the Thai population under the management of the UCS. The prevention of NCDs covers routine health check-up, risk and disease screening for diabetes, hypertension, cervical cancer, etc. These services are covered by the per capita budget for health facilities with some top-up payments. Basically, most of the services are provided by hospitals and health centres for the catchment population in each area.

Contracting units for primary care, which are mainly district hospitals and their network of primary care units and health centres, are key health-care providers responsible for providing health promotion and prevention services to the targeted populations in their locality, including community health promotion activities and campaigns. These activities include promotion of good behaviour, such as exercise, healthy diet, safe sex, control of alcohol drinking and smoking as well as environmental control. The behavioural risk factors surveillance system has been conducted by the Bureau of Non-Communicable Diseases under the Disease Control Department, MoPH, to monitor risk behaviours contributing to chronic diseases. In addition, a health exam survey is routinely conducted every five years.

In 2004, the Local Health Fund initiative was piloted. Under this Fund, matching amounts from the NHSO and local government units were pooled to tackle community health problems and ensure that community health services reach underprivileged groups or meet specific health needs in the community. The scheme has now been expanded to almost all local governments (about 7700 local government units throughout the country).

The health workforce at the primary health care level is critical to provision of basic health services, particularly in the era of chronic NCDs and an ageing society. Most health centres are supervised by professional nurses and four-year trained public health officers. There are currently plans to develop an adequate number of staff with the competency and skill mix to manage NCDs, cater to the changing health needs of the ageing population with increasing disabilities and need for home health-care services, as well as primary prevention and screening.

Management of communicable diseases including emerging diseases

Control of communicable diseases is the responsibility of the Department of Disease Control (DDC), MoPH. Routine disease surveillance is conducted by public health facilities in collaboration with the DDC. For specific communicable diseases, health facilities notify patients and then send a report to the provincial level and ministry level, respectively. Most infectious diseases are managed effectively but managing TB is a big challenge, with 117 000 new TB cases and 1200 deaths in 2015, making Thailand one of the 30 highest TB-, TB/HIV- and MDR-TB-burden countries (WHO Regional Office for South-East Asia, 2017). Outbreak detection is the responsibility of the Bureau of Epidemiology, DDC. Normally, district and provincial health authorities in collaboration with the local government unit primarily manage outbreak control with supervision of the DDC. Some outbreak investigations for emerging diseases are centrally managed by the MoPH.

The DDC, MoPH implements the IHR by strengthening the requirement for core capacity, e.g. laboratory, surveillance, response and human resources. Thailand has also adopted the “One Health” concept (Sommanustweechai et al., 2017) to address the threat of emerging infectious diseases. To this end, it has implemented multidisciplinary approaches to disease detection and response as well as further strengthened the public health emergency response, laboratory capacity and biosafety, and modelling. Recently, Thailand responded suitably to importation of MERS-CoV (Middle East respiratory syndrome coronavirus) infections. Thailand has also collaborated well with other countries in the region through enhanced animal surveillance of influenza A (H7N9).

Management of MCH

Thailand achieved MDGs 4 and 5 on maternal and child mortality. Improvements in MCH services, including high vaccine coverage, have halved the MMR from 40 in 1990 to 20 per 100 000 live births in 2015. The IMR and under-five mortality rate also significantly decreased to 10.5 and 12.2 per 1000 live births in 2016.

However, Thailand is facing new challenges. The fertility rate is getting lower; at 1.482 births per woman it is lower than the replacement fertility rate. At the same time, the teenage pregnancy rate was the highest in South-East Asia. Babies born to girls aged 15–19 years accounted for 32 out of every 1000 live births in 2002 but 54 out of every 1000 live births (United Nations Population Fund, n.d.) in 2014. Teenage pregnancies result in a poorer quality of life for both the mother and the child throughout their life-course.

Table 10.4 Thailand: Maternal, child and adolescent health indicators, 1990–2016

Indicators	1990	1995	2000	2005	2010	2016
Adolescent birth rate (per 1000 women aged 15–19 years)	51.4	47.5	43.4	42.2	47.9	51.8
Infant mortality rate (per 1000 live births)	30.9	24.4	19.6	15.6	12.8	10.5
Under-five mortality rate (per 1000 live births)	37.8	29.2	23.1	18.2	14.9	12.2
Maternal mortality ratio (per 100 000 live births)	40.0	23.0	25.0	26.0	23.0	20.0 (2015)

Source: World Bank, 2018a

Accessibility and demand for basic MCH services such as ANC, pregnancy, childbirth, neonatal care, family planning, child immunization and well-baby clinics are generally high. Child immunization coverage has been above 90% for decades with 99% coverage for measles, diphtheria–tetanus–pertussis (DTP) and hepatitis B vaccine in 2017 (World Bank, 2018a). This high coverage outperforms many of the high-income developed countries in Europe and Asia Pacific (WHO Regional Office for the Western Pacific, 2015). ART coverage for prevention of mother-to-child transmission (PMTCT) was at 94–95% of pregnant women living with HIV during 2010–2016 (World Bank, 2018a). Thailand became the first country in Asia to

eliminate mother-to-child transmission of HIV and syphilis (WHO Regional Office for South-East Asia, 2016).

The Thailand chapter in a book entitled *Good health at low cost* (Patcharanarumol et al., 2011) clearly indicates that all essential interventions for MCH services, which are effective in addressing nine major causes of under-five mortality (diarrhoea, pneumonia, measles, malaria, HIV/AIDS, birth asphyxia, preterm delivery, neonatal tetanus and neonatal sepsis) and desirable for the mother's survival, have been fully integrated into primary health-care networks of district hospitals and health centres. Nurses at district hospitals and health centres are crucial for providing MCH services. They provide ANC services as well as advice on and counselling for PMTCT, whereas high-risk pregnancies such as among women with diabetes, a history of preterm labour and hypertension, and complicated cases would be referred to a doctor.

Nurses and public health staff are key providers of family planning services, e.g. birth control pills and condoms, while doctors at district hospitals provide permanent family planning services for men and women. Child immunizations are mainly provided by nurses and public health staff in the public sector.

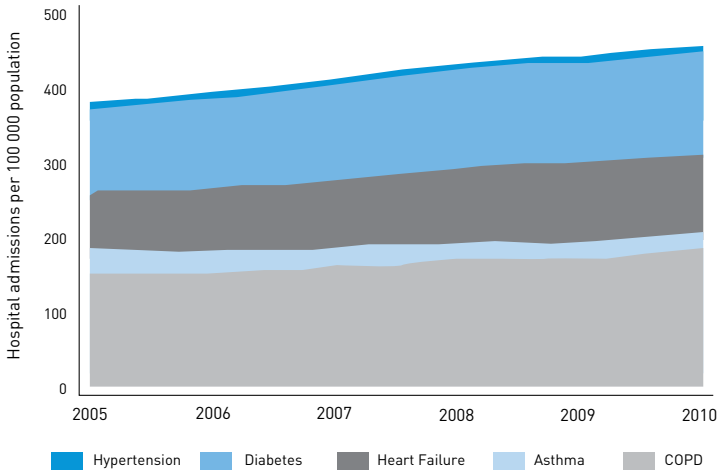
10.4 Performance of the health system

10.4.1 Effectiveness and quality

Avoidable hospital admission for chronic conditions

Hospital admission for a chronic condition could be reduced when effective interventions are performed well at the primary care level or through provision of ambulatory care. Ambulatory care-sensitive conditions (ACSC) have been measured for hospital admissions of chronic conditions. The prevalence of hospitalization due to ACSC of five illnesses (hypertension, diabetes, heart failure, asthma and COPD) increased from 378.7 in 2005 to 453.0 per 100 000 members in 2010. The most common were COPD, diabetes and heart failure (Fig. 10.7). These admissions due to ACSC would have huge cost implications for public hospitals. On the contrary, there would be gains in efficiency for the health system as a whole when these chronic conditions are well controlled at the primary care level.

Fig. 10.7 Thailand: Hospital admissions with conditions deemed controllable with ambulatory care, 15–74 years, 2005–2010

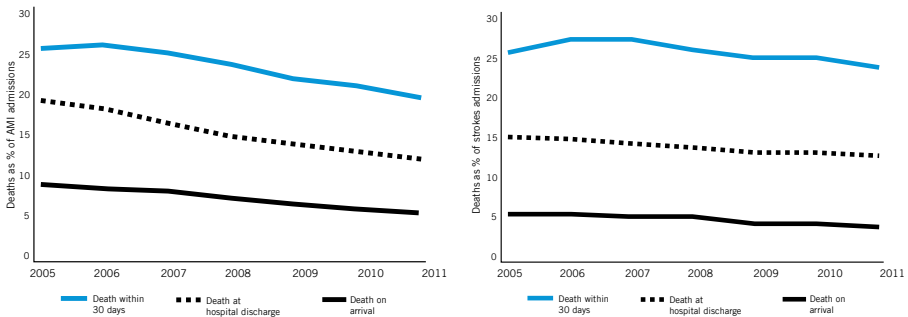


Source: WHO Regional Office for the Western Pacific, 2015

Reducing deaths from AMI and hospitalization due to ischaemic and haemorrhagic strokes

Fig. 10.8 shows that deaths following hospitalization due to acute myocardial infarction (AMI), ischaemic and haemorrhagic strokes have reduced during 2005–2011. The reduction in deaths from AMI had a better

Fig. 10.8 Thailand: Deaths from AMI (left) and strokes (right) on hospital arrival, at discharge and within 30 days of UCS patients, 2005–2011



Key: UCS: universal coverage scheme

Source: WHO Regional Office for the Western Pacific, 2015

trend than those due to ischaemic and haemorrhagic strokes during the same period. This reflects better progress in treatment outcomes of AMI than of ischaemic and haemorrhagic strokes, which could mirror an improvement in the quality of hospital services for AMI, ischaemic and haemorrhagic strokes.

10.4.2 Accessibility

Utilization of curative services; as reported by NHSO-the agency that manages UCS, has increased after the reform in UHC. The total annual number of outpatient visits by UCS members increased from 111.9 million in 2003 to 153.4 million in 2010 to 184.3 million in 2017 (National Health Security Office, 2017). Furthermore, the total annual inpatient admissions increased from 4.3 to 5.6 million to 6.0 million, whereas the total number of UCS members increased slightly from 46.0 to 47.7 million to 48.1 million over the same period, reflecting better access and increased per capita rate of utilization. The rate of outpatient use has grown more than that of admissions.

Data from national household surveys reveal that for all public-private facility types, approximately 87.8% and 60.7% of UCS patients exercised their insurance entitlement using outpatient services and hospital admissions, respectively, in 2017. Uptake of the UCS entitlement when using outpatient visits at district hospitals and health centres was more common than that for provincial hospitals. Uptake of the UCS entitlement using hospital admissions in public hospitals was much higher than that in private hospitals (Patcharanarumol et al., 2011).

For high-cost interventions, especially for renal replacement therapy, between 2013 and 2017, the number of patients with chronic kidney failure who got peritoneal dialysis increased from 14 225 to 28 258 cases; the number on haemodialysis increased from 7855 to 16 527 cases and kidney transplant increased from 86 to 208 cases (Patcharanarumol et al., 2011).

Screening for diabetes by measuring fasting blood sugar among Thai adults (35–74 years) increased from 56.3% in 2016 to 59.3% in 2017 and screening for hypertension increased from 58.5% in 2016 to 60.9% in 2017. However,

these screening outputs were much lower than the target of at least 90% for both diabetes and hypertension (Patcharanarumol et al., 2011).

The evidence reveals that UCS resulted in pro-poor use of health services; the lower socioeconomic status of UCS members, and higher access to health services, particularly in district hospitals and health centres. The book *Thai health systems in transition* (WHO Regional Office for the Western Pacific, 2015) indicates that “across the gradient of household’s living standard measured by asset quintiles, the poorest quintile used outpatient services disproportionately more (26–28% vs 8–10% of total national outpatient services) than the richest counterpart during the first decade after UC reform. To a similar degree, inpatient admissions were concentrated more among the poor than the rich over the same period.”

10.4.3 Resilience

The Thai health systems have proven resilience to many large-scale natural and human-induced disasters and policy reforms. These include Asian Economic Crisis (1997), sin tax for Thai Health Promotion Foundation (2001), health financing reforms for UHC policy (2002), H5N1 outbreak (2004), Tsunami (2006), National Health Commission Office (2007), severe flood (2011) and cases of MERS-CoV in 2016. In addition, the governance system for health has changed dramatically with the establishment of new autonomous agencies in health. It is noteworthy that the health systems of Thailand responded well to those crises and reforms in a positive way so that health outcomes continued to improve and the system has remained sustainable.

Political commitment and sufficient domestic resources were crucial factors for supporting the resilience of the health systems. Importantly, a competent health workforce and village health volunteers, who were committed to serving people for better health, were indispensable factors. Their implementing capacity to implement and translate policy reforms into real actions was incredible, as they could adjust and adapt themselves sufficiently to respond to major disasters and pandemics. Collaboration with and support of the non-health sectors, e.g. during the severe flood in 2011, Army-supported mobile hospitals and transportation were used to deliver peritoneal dialysis solution to patients’ homes in flooded areas.

Furthermore, Thai society is unique as Thai citizens actively support others, even when they are not rich. These are foundations for the resilience of health systems.

10.5 Conclusions

Thailand became an ageing society in 2015 when the proportion of people aged above 60 years reached 15.82% of total population. In addition, between 1970 and 2016, the percentage of the population aged 65 years and above more than tripled from 3.1% to 10.9%. The health-care system in Thailand is organized to manage acute episodic care while an ageing population needs long-term care, which involved integration of the health and social services. Almost all the elderly in Thailand who need long-term care receive informal care from their family members or relatives. There are some institutionalized long-term care centres organized by private for-profit organizations. However, many issues, including standards of care and living, level of training needed for carers and care managers, and licensing and accreditation still need to be clarified. Even then, most of these long-term care facilities are prohibitively expensive for the majority of the people. The health-care system also needs to be strengthened, especially at the primary health care level to support community-oriented long-term care. There is an urgent need for effective collaboration between the health and social welfare sectors to develop family- and community-based systems that can respond to the needs of the elderly.

While rural health services are well established and maintained, and have contributed significantly to the UHC goals of equitable access and financial risk protection; urban health systems are dominated by hospital-oriented care, private clinics and hospitals, and suffer from weak municipality health systems characterized by ineffective primary health care infrastructure, ill-suited to cater to the needs of patients with chronic diseases. There is great scope for strengthening urban primary health care systems and the feasibility should be explored of contracting out to qualified private clinics for not just curative but also preventive and health promotion services.

Increased prevalence of chronic disabling conditions in the elderly results in an increasing demand for rehabilitation services. Rehabilitation personnel are concentrated in tertiary urban hospitals not reachable by the majority of

rural people in need of care. Increased training capacity, redistribution of rehabilitation personnel and redesigning community-based and secondary health care are some of the challenges for future reforms. Future reforms are also needed to develop palliative care services. There is currently no specific organization responsible for delivering palliative care, while there is exponential growth in demand. A particular challenge is the strengthening of home-based palliative care to which most terminally ill patients have access.

Mental health care should be organized through a network in which primary health care provides community-based mental health promotion and prevention. Primary health care has to ensure regular supplies of antipsychotic drugs and adherence to medication with support from families and the community. Strengthening primary health care and referral processes with an adequate number of skilled staff is a key success factor for effective management of mental health care in the society.

Many of the risk factors that impact NCDs are multisectoral and are supported by strong industrial lobbies. The health and non-health sectors have to work together to tackle these issues. Since 2007, Thailand has had an annual NHA. Working across sectors, including public, private, academia and civil society, the NHA uses the “Health in All Policies” philosophy to pass resolutions that often deal with the economic and social determinants of health. However, ownership and capacity of intersectoral partners and agencies charged with implementing these resolutions has been a major challenge, resulting in poor downstream enactment. Although the NHA is a good mechanism for multisectoral and intersectoral collaboration on health-related issues that are of concern to the population, much more work is needed to improve implementation of its resolutions by line agencies and ministries (Kanchanachitra et al., 2018).

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Chapter 11. The Philippines

Manuel M Dayrit, Elvira SN Dayrit, Jeremie E De Guzman, Geminn Louis C Apostol



11.1 Introduction

11.1.1 Socioeconomic context

The Philippines is a tropical archipelago of 7107 islands with a total population of 104.9 million (World Bank, 2018a). The 81 provinces, 145 cities and 1489 municipalities are organized into 17 administrative regions, the densest of which is the National Capital Region (NCR) (20 785 people per sq.km) (Philippine Statistics Authority, 2017a) where Metro Manila is located. Each municipality is composed of 10–50 *barangays* (villages). The *barangay* is the smallest political unit, with a population size of between 1000 and 20 000 people. There are a total of 42 036 *barangays* in the country, of which 4720 are classified as geographically isolated and disadvantaged areas (GIDA).

About 49 million people live in highly urbanized areas and 55.9 million in rural areas. Recently classified as a lower middle-income country (LMIC), the Philippines has one of the most vibrant economies in South-East Asia. The GDP has been growing at an annual rate of 6.4% from 2010 to 2017 (World Bank, 2018a). The economic policy is focused on globalization, trade liberalization, deregulation and market reforms, all of which rely on a dynamic private sector. The drivers of growth are the services sector (59.9% of GDP) and industry (30.5% of GDP). The contribution of agriculture to the GDP has decreased from 12% in 2006 to less than 10% in 2017 (World Bank, 2018a). The Philippines has continued to invest in human capital development through increased spending on health, education and service delivery. In 2015, the share of health expenditure was 4.4% of the GDP (World Bank, 2018a), which is slightly below the minimum of 5% recommended by the United Nations (UN).

The poorest segments of the population are farmers and fishermen who live at subsistence level. Rural poverty drives the poor to urban centres, where they become slum dwellers. To identify the poor and allow for a more targeted provision of welfare and social protection services, the National Household Targeting System for Poverty Reduction (NHTS-PR) was established in 2008 (Fernandez, 2012). By 2012, the national poverty database consisted of about 5.2 million poor households located in 1630 municipalities and cities nationwide.

In 2010, the country committed to UHC with three strategic thrusts: (i) financial risk protection through expansion in enrolment and benefit delivery of the National Health Insurance Program (NHIP); (ii) improved access to quality hospitals and health-care facilities; and (iii) attainment of the health-related MDGs (Department of Health, 2010).

Macroeconomic indicators are given in Table 11.1.

Table 11.1 Philippines: Socioeconomic indicators, 1980–2017

Indicators	1980	1990	2000	2010	2015	2017
Population, total (in millions)	47.4	61.9	78.0	93.7	101.7	104.9
Population density (people per sq.km of land area)	159.0	207.8	261.6	314.3	341.1	351.9
Fertility rate, total (births per woman)	5.2	4.3	3.8	3.2	3.0	2.9 (2016)
Birth rate, crude (per 1000 people)	36.6	33	29.6	24.8	23.4	23.2 (2016)
Death rate, crude (per 1000 people)	8.2	6.6	6.0	6.2	6.5	6.5 (2016)
Population growth (annual %)	2.7	2.5	2.1	1.6	1.6	1.5 (2016)
Population ages 65 and above (% of total)	3.2	3.1	3.3	4.1	4.6	4.8
Age dependency ratio, old (% of working-age population)	6.0	5.6	5.6	6.7	7.2	7.6
Age dependency ratio, young (% of working-age population)	80.3	73.2	66.1	54.7	51.0	50.0
GDP (current US\$, billions)	32.5	44.3	81.0	199.6	292.8	313.6
GDP per capita (current US\$)	684.7	715.3	1038.9	2129.5	2878.3	2989
GDP growth (annual %)	5.1	3.0	4.4	7.6	6.1	6.7
Gross national expenditure (% of GDP)	104.9	105.8	102	101.8	105.9	109.6
Tax revenue (% of GDP)	..	14.1	12.8	12.1	13.6	13.7 (2016)
Central Government debt, total (% of GDP)	..	51.3	60.5	52.4	..	..
Agriculture, forestry and fishing, value added (% of GDP)	25.1	21.9	14.0	12.3	10.3	9.7
Industry, value added (% of GDP)	38.8	34.5	34.5	32.6	30.9	30.5
Services, value added (% of GDP)	36.1	43.6	51.6	55.1	58.8	59.9
Labour force, total (in millions)		22.7	30.0	38.6	43.0	44.6
Unemployment, total (% of total labour force) (modelled ILO estimate)	..	..	3.7	3.6	3.0	2.3
Personal remittances, received (% of GDP)	1.9	3.3	8.5	10.8	10.2	10.5
Current health expenditure (% of GDP)	..	..	3.2	4.3	4.4	..
Income inequality (Gini coefficient; World Bank estimate)			46.17			

Key: GDP: gross domestic product; ILO – International Labour Organization

Source: World Bank, 2018a

11.1.2 Political context

The Philippines is a democratic republic with three branches of government: executive, legislature and judiciary. It has a constitution, which is the fundamental law of the land. The President, Vice President and members of Congress are all elected by popular elections. The President appoints members of the Judiciary and Cabinet, with the latter heading the large line agencies of the government. The appointment of these officials needs to be confirmed by the Legislature. The Secretary of the Department of Health (DoH) is a member of the President's Cabinet.

Public health policy is formulated through actions of the Executive branch (e.g. Presidential Executive Orders; DoH Administrative Orders) and the Legislature (laws).

11.1.3 Natural and human-induced disasters

The Philippines is the world's third most at-risk country for natural disasters (Bündnis Entwicklung Hilft, 2017). Compared to neighbouring countries, the Philippines has the highest risk index (5.2) in the ASEAN region; Cambodia, Indonesia and Viet Nam have risk indexes of 4.7, 4.4 and 3.5, respectively (INFORM Global Risk Index, 2018).

From 2000 to 2016, the Philippines experienced 281 natural disasters, which affected roughly 125 million people and caused over 23 000 deaths. The associated socioeconomic damage was about US\$ 20 billion, with an average annual damage of US\$ 1.2 billion (Jha et al., 2018). Between 2006 and 2015, the Philippines had an average occurrence of 18.1 disasters per year (Guha-Sapir et al., 2016).

11.2 Health status and risk factors

11.2.1 Health status

Life expectancy

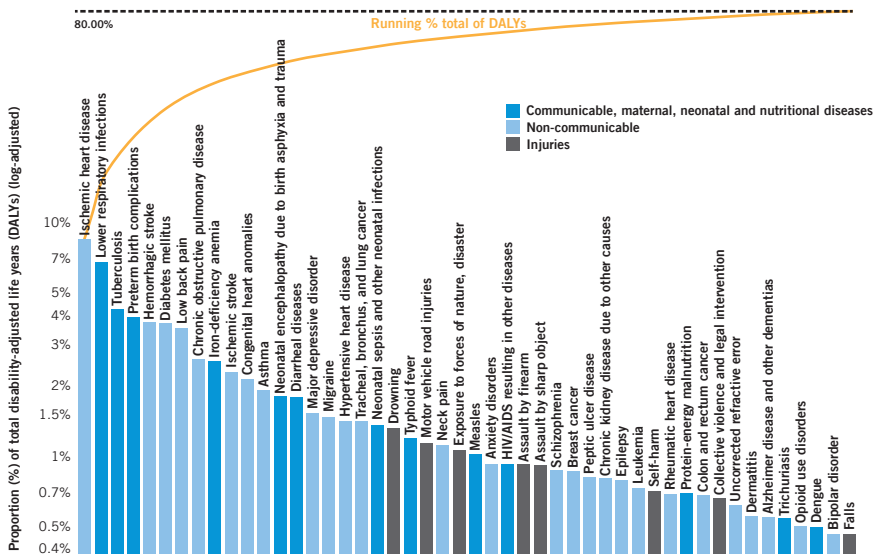
Between 1990 and 2016, the average life expectancy of Filipinos at birth showed a modest increase from 65 years to 69 years. In 2016, it was 66 years for men and 73 years for women. However, these gains in life expectancy have lagged behind those of other countries in the region. For

example, in 1974, both Thailand and the Philippines had the same average life expectancy of 61 years; today, Thai citizens live 6 years longer than Filipinos (World Bank, 2018b).

Burden of disease

The health status of Filipinos reflects the epidemiological transition occurring in LMICs where the burden of NCDs has overtaken that of communicable diseases. In an analysis of the disease burden, Wong et al. identified 221 categories of illness and, using Pareto analysis, showed that the top 48 or 22% of diseases accounted for 80% of total DALYs lost (Fig. 11.1). Twenty-seven diseases were NCDs, 13 were communicable, maternal and nutritional diseases, and eight were injuries. In terms of DALYs, NCDs accounted for 61% of the disease burden in 2015, with a projected rise to 66.5% by 2035. On the other hand, the share of disease burden of communicable, maternal, neonatal and nutritional disorders is projected to decrease from 30.8% to 25.5% in the same 20-year period (Wong et al., 2018).

Fig. 11.1 Philippines: Top 48 diseases based on DALYs, 2015



Source: Wong et al., 2018

Five NCDs in the top 20, which are closely associated with lifestyle, smoking, diet and exercise, accounted for one third of DALYs, namely, ischaemic heart disease, haemorrhagic stroke, ischaemic stroke, hypertensive heart disease and diabetes mellitus. Related to this, the prevalence of obesity in the population is now at 9.2% for children aged 10–19 years of age and 31.1% in adults aged 20 years and above (Food and Nutrition Research Institute, 2015).

Other NCDs in the top 48 worth noting are: COPD associated with tobacco use (2.6% of DALYs); asthma (2.0%); mental disorders, including depression, anxiety, Alzheimer, dementia, schizophrenia and bipolar disorder (4.2%); cancers, including breast, colon and leukaemia (2.4%); motor vehicle road injuries (1.6%) and exposure to forces of nature and disasters (1.0%).

The rise in the NCD disease burden is already impacting the social insurance system. Diabetes (3.5% of total DALYs) affects 5% of all Filipinos, with a prevalence of 12% among persons aged 60–69 years (Panelo et al., 2017) and is a major cost driver. In 2015, the Philippine Health Insurance Corporation (PhilHealth) paid out PhP 6.3 billion for haemodialysis of diabetic end-stage renal disease, accounting for 7.2% of PhilHealth claims that year (Philippine Health Insurance Corporation, 2015).

Two communicable diseases, i.e. lower respiratory tract infections (community-acquired pneumonias) and TB are ranked second and third, respectively, jointly contributing 11.1% of the total DALYs.

TB prevalence was halved from 1990 to 2015, thus achieving the MDG goal. However, a 2016 national survey showed that TB prevalence had not decreased compared to the 2007 national survey and that the number of missed cases was high. Smear-positive TB increased from 1.93 per 1000 in 2007 to 2.86 per 1000 in 2016. Rifampicin resistance in 2016 was 7.3% (Department of Health, Foundation for the Advancement of Clinical Epidemiology & Philippine Council for Health Research and Development, 2017).

The Philippines did not achieve the 2015 MDG target for HIV/ AIDS and had the highest percentage increase (140%) of new HIV infections in the Asia and the Pacific from 2010 to 2016 (UNAIDS, 2017). Reasons for the increase include the shift to a more aggressive subtype of the virus (Salvana et al., 2017), increase in transmission among men who have sex with men (MSM) (Department of Health – Epidemiology Bureau, 2018), and increase in testing due to an increase in the number of testing sites.

Infant mortality rate

There have been significant gains in reducing infant and child mortality in the past 25 years. The IMR fell from 34 infant deaths per 1000 live births in 1993 to 21 per 1000 in 2016 (Philippine Statistics Authority and ICF International, 2018). However, the decline in infant deaths has levelled off, possibly due to the persistently high neonatal mortality (Kraft et al., 2013). The burden of disease analysis supports this hypothesis. Disorders in the neonatal period, namely, neonatal encephalopathy due to birth asphyxia, and trauma and neonatal sepsis account for 3.2% of total DALYs.

Undernutrition

Stunting persists at 33.4% among children less than 5 years of age and is associated with a complex web of determinants, which include poverty, access to clean water and sanitation, female education, maternal nutrition, family size and food security. It is highest in the poorest quintile at 49.7% compared to 14.7% in the richest quintile (Food and Nutrition Research Institute, 2015).

Maternal mortality ratio

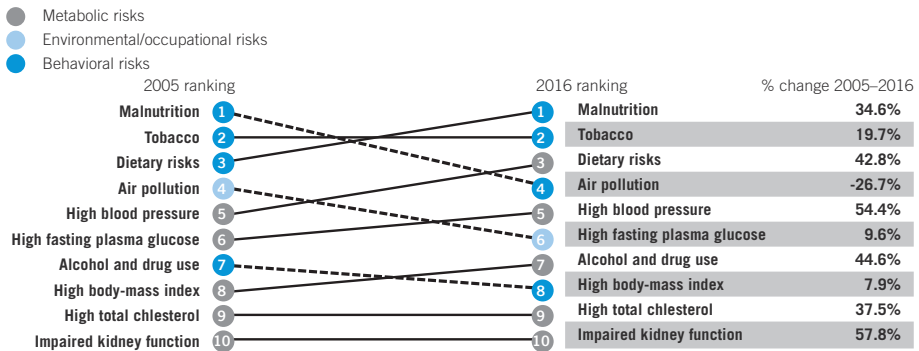
A WHO report classified the Philippines as one of 26 countries that have shown “no progress” in reducing MMR based on modelled estimates of MMR. Specifically, in 1990, MMR stood at 152 per 100 000 live births; it was at 114 in 2015 (WHO, 2015).

Poor access to health care among the poorest quintiles is one explanation for the unchanged MMR. Only 40% of mothers from the poorest quintile are delivered by a skilled birth attendant and only 30% deliver in a health facility (Philippine Statistics Authority, 2013).

11.2.2 Risk factors

The leading risk factors that contribute to DALYs include dietary risks, tobacco and high blood pressure (Fig. 11.2). Between 2005 and 2016, high fasting plasma glucose level and high BMI have had the biggest rise as risk factors while malnutrition has had the biggest fall.

Fig. 11.2 Philippines: Top 10 risks contributing to DALYs and percent change, all ages, 2005 and 2016



Source: Institute for Health Metrics and Evaluation, 2018

11.3 The health system

11.3.1 Organization and governance

The Philippine health system is a mix of public and private providers within a market-based system. Public and private health-care facilities exist from the primary to tertiary levels and citizen access to these facilities is determined by individual preferences, geographical location and ability to pay. There are no gatekeepers at the primary level, where citizens can opt to visit traditional healers, public or private clinics and hospitals (see Section 11.3.5 – Provision of services). The private sector has 53% of hospital beds (Department of Health – Health Facilities and Services Regulatory Bureau, 2017) accounting for 65% of total health expenditure.

The DoH sets national health policies, health plans and strategies, standards and guidelines for national public health programmes. It licenses all hospitals in the country and also regulates food and pharmaceutical products (Department of Health, 2018). The Professional Regulation Commission (PRC) regulates the practice of health professionals. Both agencies are financed by general appropriations.

PhilHealth administers the national health insurance programme. It is an attached agency of the DoH and is chaired by the Health Secretary. PhilHealth is financed through general appropriations, including sin tax revenues and premium collections.

Prior to 1991, the DoH directly managed most of the country's government hospitals and municipal health centres. The Local Government Code of 1991 transferred the responsibility for managing health services at the provincial, city and municipal levels to the local government units (LGUs). Thereafter, the role of the DoH in local government health services was limited to national policy direction and technical and logistics assistance (Republic of the Philippines, 1991).

The Local Code mandates the creation of local health boards (LHBs) at the provincial, city and municipal levels, which determine local health priorities for local budget allocation. The DoH is represented in all LHBs by designated DoH representatives from the DoH regional offices.

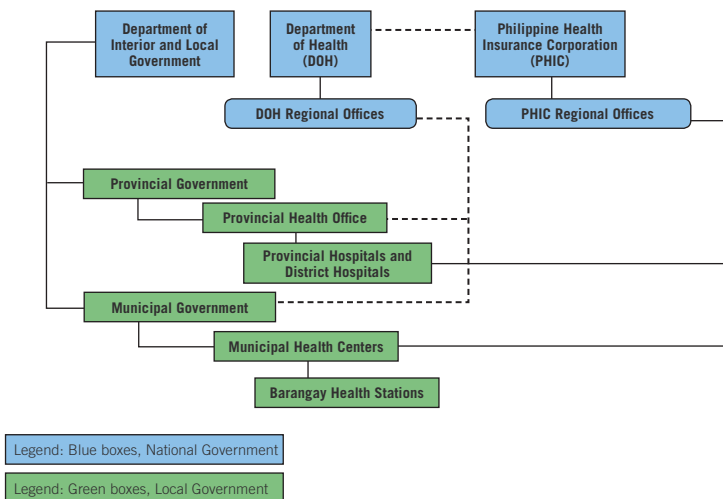
LGU plans and budgets are finalized in regional development councils (RDCs) and consolidated and approved by the National Economic Development Authority (NEDA). These are incorporated in the General Appropriations Act, which is approved by the Legislature and signed into law by the President every fiscal year.

The front-line public health providers are in the municipal health centres in both urban and rural areas. A standard health centre would have at least one physician, two nurses and five midwives. Midwives are rotated in satellite units called *barangay* health stations. The municipal physician (also called municipal health officer or MHO) usually takes charge of outpatient curative services, while the nurses manage the logistics, staff training

and reporting systems. The midwife is the front-line health provider for maternity and child care and works with the village volunteers (also called *barangay* health workers or BHWs) who assist in health education and follow up of patients.

As Fig. 11.3 indicates, the accountabilities of LGUs are complex. As political entities, they are answerable to their local constituents. They are accountable to Department of Interior and Local Government (DILG) for local governance concerns and they report to the DoH for health programme performance. As users of public funds, they are audited by the Commission on Audit (CoA).

Fig. 11.3 Philippines: Schematic diagram of national and local health governance



Source: By the authors

The DoH has functional authority over LGU health units. PhilHealth accredits LGU health facilities and reimburses claims for services rendered to members.

While the DoH has no direct power over LGUs and has to use financial and in-kind incentives as well as moral suasion to secure LGU compliance to

national policies and programmes, it has a regulatory role in licensing LGU health facilities.

11.3.2 Patient-centredness

A 2014 study looked at the level of responsiveness that the Philippines health system has to patients' needs and asked what patients thought of services at their LGUs. While 70% of patients said that their expectations were met in terms of the way they were treated and serviced by the facility personnel, only 56% reported being satisfied with the adequacy of equipment and medicines (Acuin, 2014).

Today, at the local government level, some exemplary mayors make their constituents active partners in health by finding ways to empower them. They provide employment or create income-generating projects and veer away from top-down, dole-out programmes. In these cases, LGUs have become the health leaders envisioned by the local government code (Zuellig Family Foundation, 2018).

11.3.3 Financing

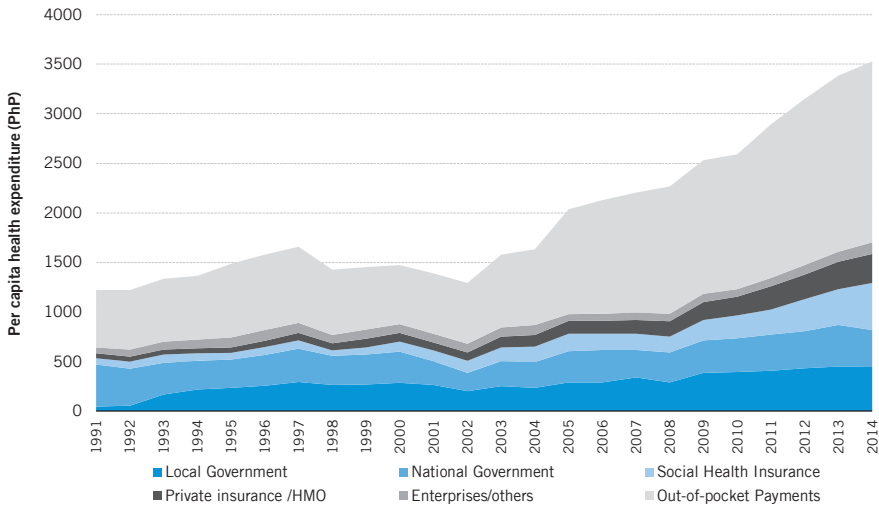
The total health expenditure (THE) was PhP 655 billion⁵ (US\$ 13.2 billion) and constituted 4.5% of the country's GDP in 2016. It grew by 10.5% from the previous year (PhP 593 billion or US\$ 11.7 billion) and reflected dynamism in the health sector and an increasing willingness of Filipinos to pay for health products and services (Philippine Statistics Authority, 2017b). These increases are attributed to the 2012 legislation, which earmarked taxes collected from tobacco sales for PhilHealth premiums (Republic of the Philippines, 2012a).

In 2016, the government contributed 34.2% (PhP 215 billion or US\$ 4.3 billion) to THE – 20% from national and local governments and 14.2% from PhilHealth. But the largest source (54.25%) of THE was OOP payments (PhP 342 billion or US\$ 6.8 billion), which has steadily risen over the years. Voluntary health insurance schemes accounted for 11.6% (PhP 73 billion or US\$ 1.4 billion) (Philippine Statistics Authority, 2017b).

⁵ End of 2016 exchange rate rounded to 1 US\$ = 50 PhP

The average real health expenditure per capita was PhP 4406 (US\$ 87.1 per capita) in 2016 and has risen significantly over the past 25 years (225% from PhP 1219 or US\$ 24.11), outpacing average real GDP growth per capita (Panelo et al., 2017) (Fig.11.4).

Fig. 11.4 Philippines: Per capita health expenditure growth by source (constant 2000 prices), 1991–2014



Source: Panelo et al., 2017

Social health insurance (SHI) accounted for 8.7% of THE in 2005, increasing to 11.5% in 2013 (National Statistical Coordination Board, 2013). Membership in SHI was officially at 91% of the population in 2016 (Philippine Health Insurance Corporation, 2016).

The scope of PhilHealth benefits remains narrow, with inadequate coverage of primary and emergency care. PhilHealth financing is skewed towards curative inpatient care. PhilHealth support value for inpatient care has remained at around 33% (Philippine Statistics Authority, 2017b). This means that on average, only a third to half of hospitalization costs are covered by PhilHealth.

At present, PhilHealth payments account for less than 20% of hospital revenues (Philippine Statistics Authority, 2017b). PhilHealth’s inability to

expand benefits is rooted in: (i) collection inefficiency (only 64%, especially among the informal sector); (ii) low premium rates; and (iii) limited capacity to influence the prices of health goods and services.

11.3.4 Physical and human resources

In 2016, inpatient health care was provided by 1224 licensed hospitals nationwide with a total bed capacity of 101 688, which averages to one bed per 1000 population. The government owned 47% of the total beds; 53% were owned by the private sector. NCR, which has 10–12% of the population, accounted for 30% of total beds and 57% of tertiary-level beds (Department of Health - Health Facilities and Services Regulatory Bureau, 2017). Hospitals are licensed according to the level of service capability (Table 11.2).

Table 11.2 Philippines: Classification of general hospitals by service capability

Hospital services	Level 1	Level 2	Level 3
	Consulting specialists in:	Level 1 plus the following:	Level 2 plus the following:
	<ul style="list-style-type: none"> • Medicine, Pediatrics, OB-Gyne, Surgery 	<ul style="list-style-type: none"> • Departmentalized clinical services 	<ul style="list-style-type: none"> • Teaching training with accredited residency training program in the 4 major clinical services
Clinical services for in-patients	<ul style="list-style-type: none"> • Emergency and outpatient services 	<ul style="list-style-type: none"> • Respiratory unit 	<ul style="list-style-type: none"> • Physical Medicine and Rehabilitation unit
	<ul style="list-style-type: none"> • Isolation facilities 	<ul style="list-style-type: none"> • General ICU 	<ul style="list-style-type: none"> • Ambulatory surgical clinic
	<ul style="list-style-type: none"> • Surgical/maternity facilities 	<ul style="list-style-type: none"> • High risk pregnancy unit 	<ul style="list-style-type: none"> • Dialysis clinic
		<ul style="list-style-type: none"> • NICU 	

Source: Department of Health, 2012a

There is at least one health centre in every municipality in the country. In 2016, outpatient care and public health services were delivered through 2587 municipal health centres and 690 government and private infirmaries (an infirmary is a category below a level 1 hospital).

The 2015 OECD International Migration Outlook ranked Philippines as the first source country for nurses and sixth for doctors (OECD, 2015). For temporary migration, the main destination of Filipino nurses was the Middle Eastern countries, while for permanent migration it was the USA.

The 5-year average annual production of new health professionals is 2700 physicians, 28 000 nurses, 2500 midwives, 4100 medical technologists and 600 dentists (Professional Regulation Commission, 2016). These graduates are mostly products of private schools. Production of health professionals is trending upwards except for nurses, due to the decline in demand for nurses in the US labour market.

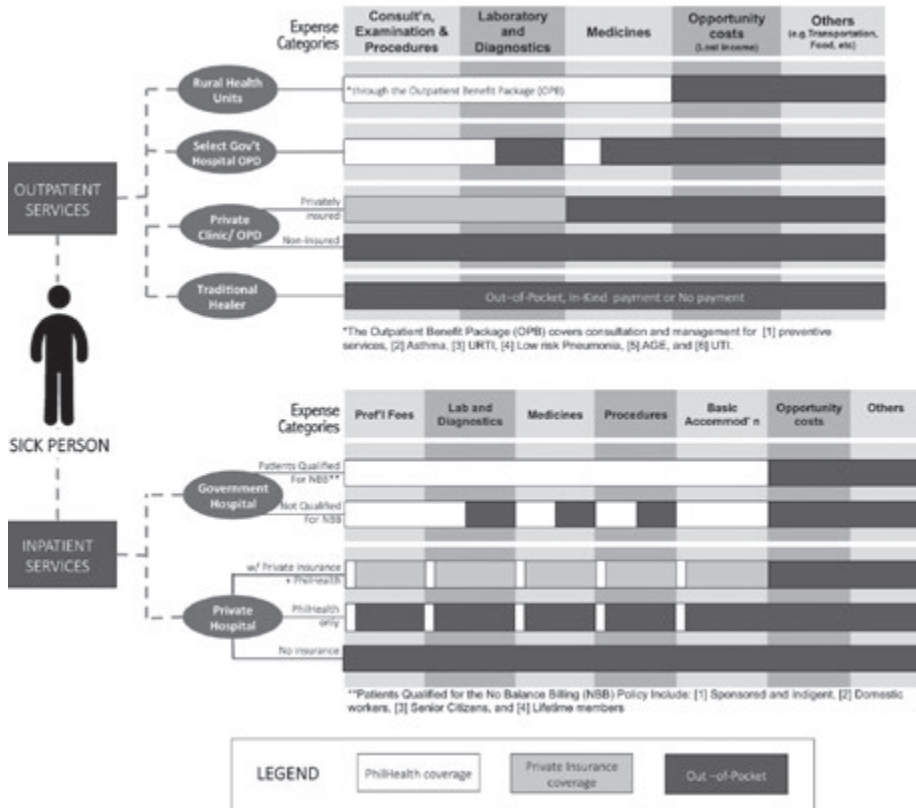
Despite substantial health workforce production, the Philippines has major problems in HRH retention, especially in far-flung areas and GIDA. Three major underlying causes of poor HRH retention are low compensation, difficult working conditions and limited job opportunities in LGUs. The DoH augments the human resources of poor municipalities by deploying doctors, nurses and midwives. For example, in 2017, the department deployed 516 doctors, 17 538 nurses and 4549 midwives to priority areas (Department of Health - Health Human Resource Development Bureau, 2017). A 2012 study revealed that 18% of deployed doctors were absorbed by the LGU after their 2-year tour of duty (Leonardia et al., 2012).

The DoH estimates that in 2017, there were 3.9 physicians per 10 000 population. The composite HRH estimate (physicians, nurses and midwives) was 16.7 per 10 000 population. These figures are an underestimate because small private hospitals and clinics have not been included. Grossly, this ratio seems below the WHO 2030 composite index of 44.5 per 10 000 population, but the figure must be interpreted with caution because of uneven distribution; urban areas having a higher concentration of health personnel.

11.3.5 Provision of services

Fig. 11.5 illustrates the various pathways for a patient to seek health care. Firstly, there are no gatekeepers in the system. A patient can seek outpatient or inpatient care from a variety of health providers. Patients transfer from one health provider to another, for example, from traditional healer to physician and vice versa, or from one facility to another. Many patients may first seek admission in a private hospital and then transfer to a government facility when finances run out.

Fig. 11.5 Philippines: The patient's journey



Source: By the authors

Secondly, OOP payment is the norm, though expenditure may be mitigated by PhilHealth or private insurance. To protect the indigent and elderly from OOP, the no-balance billing (NBB) policy was implemented in public hospitals in 2014 (PhilHealth, 2014). The policy was designed to keep hospital charges to patients within the case rates determined for reimbursements. However, in many instances, inadequate supplies and medicines at public hospitals still forced patients to buy elsewhere, resulting in OOP spending.

Thirdly, medicines are a prominent OOP expenditure, perpetuated by their persistently high prices (especially of branded drugs) and further driven by over-the-counter household purchases of medicines and nutraceuticals.

The prices of medicines are higher in the Philippines as compared to its neighbours. These cost as much as 60 times more than international reference prices, with patients paying at least three times more for branded medicines than for generic equivalents (Batangan et al., 2005; Kanavos et al., 2002; Pabico, 2006). Factors that have created this rise in prices include: (i) predominance of branded drugs driven by aggressive and pervasive marketing; (ii) inefficiency in procurement, largely due to insufficient budgets; (iii) limited enforcement of drug management procedures, audit and oversight mechanisms; and (iv) collusion and corruption at different levels (Wong et al., 2017).

The Philippine Government has enacted legislation to address the high prices of medicines (Republic of the Philippines, 2008) even as it has directly provided medicines to LGUs through PhilHealth packages, e.g. anti-TB medicines and medicines access programmes (MAPs) ,e.g. centrally procured medicines for diabetes, hypertension and HIV/AIDS.

Empowered by the Cheaper Medicines Act of 2008, the DoH has price-capped medicines under the Maximum Drug Retail Prices (MDRP) programme and, in 2016, through the establishment of the Drug Price Reference Index (DPRI). As a result of these measures, the prices of drugs have been reduced by 42.3% for originator medicines and 27% for generic medicines (Sarol, 2014). However, despite these price reductions, medicines are beyond the reach of the poor. In a study of 600 respondents, only 15 (2.5%) could fully afford the medicines they needed, including first-line antibiotics and maintenance medicines for diabetes and hypertension control (Clarete and Llanto, 2017).

Management of NCDs

The NCD programme guidelines issued in 2012 (Department of Health, 2012b) adapted the WHO Package of Essential NCD interventions for the Asia Pacific region. The main strategies include risk scoring and risk reduction through primary prevention (primarily smoking cessation and

lifestyle change) and prevention of organ damage through early treatment of conditions, especially hypertension, diabetes and obesity.

At the national and regional levels, the key activities include the establishment of baseline data on the NCD burden, standardization of health service packages for varying degrees of needs and the institution of indicators for performance and quality of care. In 2015, emphasis was given to active involvement of patients and communities in hypertension and diabetes health clubs. These were organized to distribute maintenance medicines, integrate health messages through peer group influence and sustain health monitoring by a physician.

The Sin Tax Reform Law in 2012 raised excise taxes on tobacco products (Republic of the Philippines, 2012a). The Law doubled the inflation-adjusted price of cigarettes from PhP 336/month in 2009 to PhP 678 in 2015. In 2015, the DoH declared that the increase in cigarette prices had reduced tobacco use among smokers, based on the results of the Global Adult Tobacco Survey (GATS), which showed that the prevalence of tobacco use had decreased from 29.7% in 2009 to 23.8% in 2015. The Survey also showed an increase in the percentage of smokers who intended to quit from 60.4% in 2009 to 76.7% in 2015 (Philippine Statistics Authority, 2015).

Management of communicable diseases

The Sanitation Code defines the preventive measures for communicable diseases to be implemented by LGUs (Republic of the Philippines, 1991). A national disease surveillance system tracks communicable diseases such as measles, dengue, diarrhoea, malaria, HIV/AIDS and MDR-TB. Early detection and control of outbreaks are undertaken by trained field epidemiologists (Department of Health – Epidemiology Bureau, 2018).

TB patients are treated in DOTS centres, which are managed by the LGU, the private sector or the DoH. Standard medication packs for specific types of patients are provided by the DoH. MDR-TB cases are given a special regimen. TB-DOTS centres are dependent on the DoH for anti-TB medicines and laboratory supplies. Laboratory-based surveillance of resistance to anti-TB drugs and other antimicrobials is ongoing in sentinel hospitals.

In 2016, the government budgeted PhP 1.0 billion for anti-TB medicines, which were provided to municipal health centres (Department of Budget and Management, 2016). This allocation is separate from PhilHealth reimbursements for the TB-DOTS package, which amounted to PhP 101.59 million in 2015 (PhilHealth, 2015).

A rising trend in intravenous drug use and unprotected sex among MSM were identified as factors that increase HIV infections. HIV treatment centres have now been established in all regions, but many HIV-positive patients are lost to follow up (Department of Health – Epidemiology Bureau, 2018).

The Philippines has a high prevalence of dengue. Effective vector control has not been achieved. A vaccine against dengue was introduced in 2015, but its use became controversial when critics questioned the manufacturer's claims of vaccine safety and the government procurement process (CNN Philippines, 2018).

Management of maternal and child health

The quality of and access to MCH services vary for different economic quintiles. A mother or child in the lowest quintile would go to the municipal health centre or a satellite *barangay* health station for basic primary immunization, and prenatal, natal and postnatal services, family planning and sick consultations. They may also get selected preventive services during mass campaigns such as twice-a-year deworming, micronutrient supplementation in nursery and elementary schools and “congresses for pregnant women”. Mothers and children in higher economic quintiles go private paediatricians and obstetricians for individualized health care.

Community food distribution projects and mobile medical consultation clinics are provided by many LGUs. Public MCH services are affected by the availability of supplies and equipment, the skill and attitude of the public health workers, and the changing priorities of political leaders.

Birthing services for uncomplicated births are available in licensed, freestanding birthing facilities and in hospitals, both public and private.

However, in far-flung communities, these services continue to be provided at home by a traditional birth attendant or a professional midwife. Emergency obstetric services are generally available at all levels of licensed hospitals.

The Responsible Parenthood and Reproductive Health Law, which was passed in 2012, enjoins local governments to provide modern family planning methods (Republic of the Philippines, 2012b).

11.4 Performance of the health system

11.4.1 Effectiveness and quality

Health outcomes are generally improving, and several infectious diseases have been eradicated or eliminated (polio, neonatal tetanus) or contained in certain provinces (malaria), although some have re-emerged (schistosomiasis, filariasis) (Dayrit et al., 2018). However, the quality of health services across geographical areas and levels of care remains uneven. The study on Health Access and Quality (HAQ 2015) ranked the Philippines among countries that did not reach their maximum HAQ potential⁶ (Barber et al., 2017). The following are some reasons for non-achievement of maximum HAQ potential. One, despite high skilled birth attendance and “acceptable general midwifery care”, current levels of maternal and neonatal deaths remain high. Second, although infant and child mortality have been declining, preventive child care services have also declined (e.g. exclusive breastfeeding, full basic infant immunization). Patient health-care factors that have not yet been included in the current HAQ scoring also need attention. HIV prevention has not been effective. Neither has vector control of emerging diseases such as dengue been sustained. Also, death and disability from accidents and trauma need to be prevented and injuries adequately treated.

Nationally implemented standards for the quality of health facilities are determined separately by licensing standards issued by the DoH and accreditation requirements provided by PhilHealth. DoH licensing

⁶ The Healthcare Access and Quality Index is a 0 to 100 scale that quantifies levels of personal access and quality of health-care service delivery in 195 countries and territories across the globe.

standards are largely inputs-oriented (e.g. presence of certain equipment, presence of specialists) and are more comprehensive for hospitals, ambulatory and lying-in clinics but do not exist for municipal health centres. Standards for primary facilities are mainly set by PhilHealth but are designed for specific disease packages.

Concomitantly, the pursuit of higher professional qualifications, i.e. medical specialty training, is better organized for hospital-based practice than for primary care practice. This situation translates to a skewed preference of the public for hospital-based care even for primary-level concerns.

Improving the quality of health services requires efforts on several fronts. In 2010–2011, a DoH programme costing US\$ 325 million to improve the facilities of hospitals was coupled with an initiative to reassign human resources from central and regional offices to DoH hospitals. This supply-side initiative improved the utilization of public facilities by two to three times more than before the change (Picazo et al., 2016).

11.4.2 Accessibility

While populations in urban and rural areas now have good access to water and sanitation (Philippine Statistics Authority, 2017a), major barriers remain for many health services. These barriers are geographical and financial factors as well as cultural and religious influences. For example, while immunization is mandatory and vaccines are available for all infants, the national average for full basic infant immunization is only 70%, with the Autonomous Region of Muslim Mindanao (ARMM) achieving a very low 18% immunization coverage (Philippine Statistics Authority and ICF International, 2018). Vaccine stock-outs and limited mobility of midwives who have been reassigned to birthing facilities have been identified among the factors for the declining immunization performance.

Family planning information and commodities are available to all and awareness of family planning methods is 98%, but only 40% of currently married women actually utilize modern methods of contraception. Fear of side-effects remains the main barrier to utilization (Philippine Statistics Authority and ICF International, 2018).

Tertiary-care hospitals exist in all administrative regions, and government and private hospitals are found in major towns and cities, but the fear of OOP expenditure delays or denies needed health care.

11.4.3 Resilience

The Philippine Disaster Risk Reduction and Management (DRRM) Act of 2010 (Republic of the Philippines, 2010) establishes councils at the regional, provincial, municipal and *barangay* (village) levels. The law increases the emphasis on reducing disaster risks at the local level and adapting to the challenges of climate change through efforts such as communitywide vector control and sustainable water supply. This Act affords legal infrastructure for multisector collaboration in disaster prevention and preparedness. The DoH plays a major role in prepositioning drugs, medicines and other supplies in strategic locations, and providing trained HRH to respond to emergencies.

In the aftermath of Typhoon Haiyan, local and regional capacities of affected areas were extremely overwhelmed, but the activation of multisectoral, regional and national responses facilitated the immediate revival of local health systems (Lewis, Clarke and Bigdeli, 2016).

The health system performed well in public health emergencies such as the 2003 SARS outbreak (WHO Western Pacific Region, 2006) and the 2017 avian flu outbreak, largely due to existing surveillance and epidemic control systems. Lessons learnt led to improved hospital isolation facilities.

11.5 Conclusions

The health profile of the country reflects the rapid socioeconomic development and modern lifestyle, which has impacted its urban centres but has left behind a large proportion of the population still immersed in poverty in underdeveloped agricultural, upland and coastal areas, as well as in poor and crowded informal settlements in the cities.

In its quest to achieve UHC and the SDGs, the Philippines must address four key challenges.

First, it must improve the quality of services at all levels of its health system. This improvement is particularly demanded at the primary level, which is often bypassed by Filipino patients in favour of secondary and tertiary hospitals. As a result, there is much congestion in hospitals and a higher cost of care. Attention must be paid to the improvement of personal health-care services in view of the different contexts of clinical practice, from rural community-level primary care to the sophisticated highly urban tertiary hospital situation. Clinical guidelines will need to be appropriately nuanced to be relevant to specific situations.

Similarly, scrutiny of the quality of population-based services must be regularly undertaken to ensure that all requirements are met for operational efficiency and effectiveness, including the right policies, human resources, infrastructure, monitoring and evaluation. Improving quality means building on the foundations of effective health services (Das et al., 2018), being more responsive to patients and their families, and allowing for participation and feedback to continuously improve services. Systems for accreditation for continuous quality improvement will need to be maintained.

With regard to the HAQ Index, the components that pulled down the overall Philippine score would need to be addressed; namely, the quality care of patients with TB, lower respiratory tract infections, neonatal disorders, leukaemia, cardiovascular diseases, hypertensive heart disease, peptic ulcer, chronic kidney disease and congenital heart disease.

Secondly, the Philippines must ensure equitable access and inclusiveness of health services. For the poorest of the poor who have already been identified in the NHTS-PR and are considered members of PhilHealth, adequate education about their entitlements as well as guidance on the utilization of health services must be guaranteed. The same goes for those in GIDA where physical remoteness is a formidable barrier to health care. Serving vulnerable populations such as persons with disabilities and indigenous people will require innovative approaches to fulfil their special needs.

Therefore, strengthening the capacity of local governments, not only as health service providers but also as enablers for development, will be strategic. Twenty-seven years after the public health services were devolved, exemplars for excellent public health governance have emerged from among the young generation of mayors and governors who have improved health outcomes in their political jurisdictions through better leadership and innovative approaches (Zuellig Family Foundation, 2018).

Thirdly, the Philippines must address its rising OOP payments. Rising OOP expenditure alongside rising SHI coverage is a pattern shown by LMICs whose OOP expenditures average 52% of THE. It is said that with sustained economic growth, robust government expenditure on health and adept handling of risk pools, OOP expenditure can fall in what has been called the “health financing transition”. Developed countries underwent this transition as they became more affluent and addressed the social determinants of health (Fan and Savedoff, 2014).

Achieving the health financing transition is neither automatic nor inevitable. Reducing OOP in the Philippines will require a multitude of interventions, including effective prevention of illness and mortality at the primary level; expansion of PhilHealth benefits prioritizing effective interventions and preventive services; maintenance of government expenditure on health at the WHO-recommended level of 5%; mobilization of additional financial resources for health; and consolidation of health resources with one national strategic purchaser able to demand better quality and lower costs of health commodities and services.

Finally, the Philippines must find ways to synergize the activities of its public and private sectors. Unity in the pursuit of UHC is paramount, and societal norms for genuine service have to be upheld. Can the government contract out preventive and curative health-care provision of provinces or municipalities to private providers at costs that are non-inflationary but still profitable for the private provider? Can the government and private sectors devise new models of care in GIDA areas? Can the cogent use of e-health technology open new horizons for innovation?

The Philippines lies at the threshold of UHC. By learning from the successes and failures of the past 50 years, capitalizing on its growing economy and its vibrant millennial generation, the Philippines must seize the opportunity to truly transform its health system and ensure the health of all its citizens.

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Conclusion: Future opportunities and threats faced by health systems in Asia

Nima Asgari-Jirhandeh and Helena Legido-Quigley



Strategies to develop people-centered, resilient and quality oriented health systems in Asia

Asia is the most populated continent in the world with more than 4.4 billion people. The population is projected to increase to 4.9 billion by 2030 (UN, 2015), encompassing 60% of the global middle-class population (Kharas, 2010). Asia is also the largest continental economy and the fastest-growing economy, with the highest projected GDP growth rate (International Monetary Fund, 2018). As mentioned in Chapter 2, Asia is also undergoing major epidemiological, demographic, economic, ecological, urban and nutritional transitions. The different transitions, together with population and economic growth, will influence the way in which diverse countries design and reform their health systems with a view to the future. In spite of the varying nature of Asian countries and their health systems, this book highlights future opportunities and threats that they all have in common.

In this book, we have focused on the need to develop health systems that are people-centred, resilient and deliver an assured quality of health care. While countries are at different stages of embracing such a paradigm shift, we have identified many examples where countries in Asia are developing contextually appropriate strategies within these three domains.

First, regarding people-centredness, most countries have identified some activities that could be linked to giving more prominence to the people that are part of the health system, particularly emphasizing the importance of taking patients' preferences and values into consideration. For example, in some countries (e.g. Japan and Thailand), the rights of patients have been made more explicit through legal mechanisms. Article 25 of the Japanese Constitution states that "all people shall have the right to maintain the minimum standards of wholesome and cultured living", adding that the State is responsible for the promotion and extension of social welfare, security and public health (*see* Chapter 7). Similarly, in Thailand, "patients' rights" are safeguarded by the Thai Constitution promulgated in 1997, with professional organizations going a step further by adopting a very detailed "Declaration of Patients' Rights" to ensure that patients' rights are fully observed within the clinical setting (*see* Box 3.11). Furthermore, Thailand's effort is recognized as best practice in developing people-centred

approaches, particularly for its efforts at providing health services to vulnerable populations.

In other countries, people-centredness is fostered by including patients in the planning of health services and taking into account their views. For example, in Indonesia and the Philippines, through the decentralization of services, there is an increasing interest in developing bottom-up community participatory approaches (see Chapters 6 and 11). Furthermore, in Cambodia, the government is promoting participation of the community and local administration in monitoring and providing feedback on health service quality (see Chapter 5). Other Asian countries are focusing their attention on improving *patient journeys* by making them simpler and better *coordinated*. For example, Singapore has established clinical pathways with care coordinators who work with multidisciplinary teams (see Chapter 8).

Second, resilience is increasingly becoming a vital concept when assessing health systems' performance. This includes both the health system's ability to absorb a shock and the capability to transform and recover from it (Blanchet, 2015; Hanefeld et al., 2018). Resilience is relevant across Asia, as countries experience both natural and human-induced disasters, requiring health systems to respond to these shocks. The most commonly mentioned shocks in this book are the risk of outbreaks, adverse effects of climate change, growing burden of NCDs and an ageing population.

It is well known that Asia is at risk of outbreak-borne diseases such as MERS-CoV, avian influenza and Nipah virus disease. The 2003 SARS outbreak in Singapore is an example of a country that responded to the initial shock, designed a strategy to strengthen the health system, and continued with the provision of funding for surveillance of emerging infectious diseases (see Chapter 8). The region is also host to adverse weather conditions such as tropical cyclones, typhoons and floods. As a result, countries with the highest risk of experiencing such adversities have introduced risk reduction management strategies. For example, the Philippines passed the Disaster Risk Reduction and Management (DRRM) Act of 2010 (Republic of the Philippines, 2010) to establish councils at all administrative levels with multisectoral collaboration for disaster

prevention and preparedness (*see* Chapter 2). In Thailand, responses to severe floods are also supported by multisectoral collaboration with the non-health sector (*see* Chapter 10). Resilient health systems are also needed to address the growing burden of NCDs and ageing populations. All countries in Asia are making concerted efforts to build capacity to address the long-term threat of chronic conditions. Most countries are scaling up their efforts at treatment but also focusing on prevention in order to reduce future costs and promote healthier populations (*see* Chapter 3).

Finally, throughout the book, we have discussed the importance of having mechanisms in place to assure the quality of health care. Across Asia, a varying degree of progress has been made on the policies and systems in place to assure quality and the availability of data. Examples of data availability include the case of Singapore where the quality of health care is regularly reported to Parliament through the MoH's key performance indicators (*see* Chapter 8). In other countries, governments are slowly changing their policies to make public data available openly. Quality improvement initiatives at the national level include the development of the National Standards for Healthcare (NSHC) in Singapore, Healthcare Accreditation Institute in Thailand, the Indonesian National Strategies on Quality and Safety, and the National Health Performance Framework in Sri Lanka. In the Philippines, nationally implemented standards for the quality of health facilities are determined by licensing standards and accreditation requirements provided by the Philippine Health Insurance Corporation (PhilHealth) (*see* Chapter 11). In Cambodia, a donor-government-funded Health Equity and Quality Improvement Project (H-EQIP) has been established to improve the quality of care at public health facilities (*see* Chapter 5).

In general, throughout Asia, the government is the main actor promoting quality strategies; however, the private sector and professional institutions are also involved in such activities. In some instances, when the private sector is responsible for providing services, accreditation of facilities plays a role in promoting quality. Examples of public and private accreditation in the region include the National Hospital Accreditation Agency in Indonesia, and the accreditation of facilities in Singapore through the Joint Commission International.

A number of countries in Asia have also introduced HTAs (Chootipongchaivat et al., 2015). Examples include the National HTA Organization in Indonesia, the recently introduced Agency for Care Effectiveness in Singapore, and the Health Intervention and Technology Assessment Program (HiTAP) in Thailand. A few countries commission independent patient satisfaction surveys to monitor patients' perception of care and providers.

These examples highlight that positive steps have been taken across Asia to design health systems that are people-centred, resilient and deliver quality health care. However, much more needs to be done to design health systems of the future, in view of the ecological, epidemiological, demographic, economic, urban and nutritional transitions that are affecting Asian countries.

Activities that are needed to develop the health systems of the future in Asia

The cross-national and country chapters highlight certain activities that are needed across Asia, irrespective of the type of health system or the political economy in each country.

Developing a whole-of-system approach with primary health care at the forefront

An integrated health systems approach with primary health care at the forefront is needed to prevent and manage chronic conditions and ensure continuing control of communicable and infectious diseases. A focus on primary health care does not mean disregarding the needs of the hospital sector, as changes in disease patterns will also increase acute episodes that need hospitalization. Integration of services, both horizontally – across health and social care services – and vertically – between the primary, secondary and tertiary levels – are required to improve quality and people-centeredness.

Many countries in Asia are reinvigorating their health systems and focusing on primary health care to develop a more people-centred health system. For example, Indonesia is enhancing primary care capacity through regulatory

efforts and increasing deployment of human resources for health (*see* Chapter 6). In Singapore, the MoH's strategic vision is based on three shifts, including going "beyond hospital to community", by strengthening the full spectrum of service delivery outside acute care towards primary care, as well as promoting community-based models of care. The supply-side expansion needed will be supported by the roll-out of a national community nursing programme (*see* Chapter 8). In Sri Lanka, the MoH has endorsed the reorganization of primary health care as a "shared care cluster system" where a primary health-care institution that serves a defined population will be linked to specific higher-level institutions (*see* Chapter 9).

On 25–26 October 2018, at the Global Conference on Primary Health Care, countries worldwide, including Asian ones, renewed a commitment "to strengthen primary health care to achieve universal health coverage and the Sustainable Development Goals". This Conference marked the 40th anniversary of the Alma-Ata Declaration and provided an opportunity to reaffirm the original principles of a primary health care approach as a milestone for the 21st century.

However, there are still many challenges ahead, such as ensuring that primary health care is comprehensive and integrated, avoiding duplication of activities; developing the right essential packages of services for primary health care both in urban and rural areas; and having the right staffing requirements, including the numbers and skill mix. These are also all important stepping stones towards achieving UHC.

Finally, when discussing a whole-system approach, the role of the private for-profit sector alongside the public sector needs to be acknowledged. The private sector is an important heterogeneous industry that provides services at all levels of the health system. While in some countries the private sector dominates service provision (i.e. India), in others, public sector spending dominates the health system and is complemented by private sector investment (i.e. Thailand). Overall, the for-profit private sector is weakly regulated in Asia. Across the book it has been argued that regulation should seek to ensure that service provision within the private for profit sector is equitable and, if possible, aligned to public sector strategies. Furthermore, countries must ensure that they have systems in place to safeguard health

against powerful vested interests, particularly when engaging in public-private partnerships (*see* Chapter 1).

Ensuring adequate sustainable financing

A focus on sustainable financing is necessary to ensure that UHC is maintained or achieved across Asia. Most Asian countries have developed their own path to financing, aiming to improve equity and reduce OOP expenditure. However, most countries are facing pressure on the capacity and financial sustainability of their health systems. As a result of such pressures, countries are developing new ways of collecting revenues and are designing new schemes to provide services for an ageing population and to support those in difficulty. For example, in Japan, to cover the increasing cost of health and social care services for the elderly, “late stage medical care for the elderly” has been introduced (*see* Chapter 7). Singapore relies on MediShield, a universal health insurance scheme that provides lifelong catastrophic cover for selected specialist outpatient treatments, and Medifund, an endowment set aside to support those in financial difficulty (*see* Chapter 8). Thailand is piloting combined health and social care services in the community by pooling funds from the LGU and the NHSO, and giving the local community a much bigger say on how best to invest (*see* Chapter 10). Other countries such as the Philippines are using sin taxes to support the expanded PhilHealth programme. The newly passed UHC Bill will further curtail the OOP component by stopping balance billing by providers (Philippines Department of Health, n.d.).

As middle-income countries design their UHC strategies, it is important that they also include public health activities, including health promotion and prevention. For example, Thailand has earmarked funding from sin tax for health promotion and the Philippines is currently in the process of passing legislature for a health promotion fund.

Finally, as a consequence of economic development, many countries in Asia are graduating away from support by the major global health programmes such as Gavi, the Vaccine Alliance, and the Global Fund. The sustainability of activities supported by these programmes is a key concern for recipient countries. Countries graduating away from support have to best plan and

implement health-related programmes that transition to local ownership with domestic funding sources (Pearson and Mundy, 2015).

Fostering a responsive health-care workforce

Provision of good-quality health systems relies on appropriate human resources to deliver care, which in turn translates into having the right number of people, empowered to do the right thing at the right location, and the right time. In most Asian middle-income countries, the number of health-care workers is below the WHO-recommended figure of 44.5 per 10 000 population (WHO, 2016). Even in those countries where the number of health-care workers is above the threshold, there are still challenges to having a responsive health-care workforce. These include insufficient cadres of health workers; inadequate training; and the unmet need to empower doctors, nurses, midwives and pharmacists to go beyond their traditional roles.

In addition, issues of retention of staff and geographical maldistribution affect most middle-income countries in Asia. Rural retention is poor and steps such as using local training facilities, compulsory service in rural areas for a fixed period in exchange for training, and financial incentives to keep health-care workers in rural areas have shown mixed results. A positive example is the case of Thailand, where the government has made policy interventions for retaining the rural health workforce in public health facilities, such as recruiting local students for local training and new health professional graduates for local placement, offering both financial and non-financial incentives (*see* Chapter 10).

Furthermore, in many Asian countries, ministries of health tend to focus on formal health-care workers and overlook the role and impact of the remaining cadres of people associated with health care, be it formal community-based care workers, NGO-led care workers or informal caregivers. Often, the work done by these groups is an important part of the health landscape. However, there is now a more concerted effort to recognize these groups, as shown by the recently published WHO guidelines on optimizing CHW programmes (WHO, 2018). It has also been highlighted across the book that CHWs offer a means of reaching out to rural communities in countries with small numbers of conventional health

workers. Several studies in Bangladesh, India, Indonesia, Pakistan and Sri Lanka examined home health education by CHWs in rural communities, and found that they could successfully manage hypertension, diabetes and mental health. Narayana Health in India has developed a training programme where nurses can use educational resources to update their skill sets, and provides learning opportunities for nurses to learn beyond their area of care (*see* Chapter 3).

Another key challenge identified in the book is the impact of dual practice on the availability of staff in the public sector. To address the shortage in human resources, some countries have opted to design campaigns and specific interventions to recruit additional personnel. For example, Singapore has sought to expand its nursing workforce through the “Care To Go Beyond” campaign, which includes activities such as the use of social media, scholarships and career fairs to attract, recruit and retain personnel (*see* Chapter 8).

Given the limited supply of mainstream health professionals in many countries of Asia, such as doctors and nurses, task-shifting has also been suggested as a strategy to combat such shortage of supply. Task-shifting involves sharing and delegating activities to those with lower levels of training. For example, CHWs with a relatively basic training have the potential to provide some services in areas that are otherwise difficult to staff, thereby accelerating progress towards UHC (*see* Chapter 3). Overall, there is a need for an expanded cadre of health workers, deployed in a wide range of health facilities, where health-care professionals are treated with respect, rewarded appropriately for their work and are provided with training opportunities.

Addressing the health needs of vulnerable subgroups such as migrants and refugees

Asia hosts the largest group of refugees and some of the largest migrant and internally displaced populations in the world. Economic drivers and conflicts have seen major population shifts in China, Mekong Basin countries and South Asia. The main countries receiving migrants in Asia and the Pacific are Australia, China, India, Islamic Republic of Iran, Japan, Kazakhstan, Malaysia, Pakistan, Russian Federation and Thailand. To

underscore the importance of vulnerable groups within the region, we have paid special attention in this book to migrants' health needs and have explored numerous barriers to accessing services in the different cross-national chapters.

While much more concerted action is needed in this area, some Asian countries have also developed policies and initiatives that are migrant-sensitive, and can further strengthen the integration of migrant populations with people-centred care. Several positive examples have been provided throughout this book. For example, Thailand has emerged as a leader in extending coverage to registered and non-registered migrants working in the formal sector, although there have been challenges in extending coverage to those with a precarious immigration status (*see* Chapter 10). In Malaysia, the UN High Commissioner for Refugees partnered with RHB Bank and launched the Refugee Medical Insurance scheme to improve refugees' access to health services. In Sri Lanka, a targeted initiative to prevent and treat NCDs has been developed specially for migrant populations (*see* Chapter 3).

Countries in Asia have acknowledged the need to work collaboratively in devising sustainable approaches to address migratory movements, and the influx of asylum seekers in the respective regions. However, much remains to be understood about the health needs of these vulnerable populations and the ways in which the various health systems can address health inequities and other social, economic and political determinants of health. As countries in Asia continue to seek solutions to address migrant health, this book provides several case studies to address the lack of evidence in this area.

Adopting new technologies

In the past decade, Asia has experienced a substantial growth in access to IT, including personal mobile devices, Internet access and connectivity, with some countries having some of the highest rates of mobile phone penetration globally (*see* Chapter 3). New technologies, understood as the processes that reinvigorate and integrate health systems as a whole, have a fundamental role to play in the future of the health sector. For example, different models of electronic patient records have been adopted across

Asia to help with integration and quality of health care. In Singapore, the emphasis has been on linking data from different providers, while Sri Lanka is piloting the use of patient-held electronic records. There are also many other examples of using m-health and e-health in the region. These include outreach for health promotion, logistical support for medicine stock-outs, and improving outpatient care by sending reminders for routine follow up and remote interpretation of investigations, among others. Furthermore, many countries in Asia are funding UHC by introducing health insurance schemes, which rely on strategic purchasing to ensure cost-effectiveness. HTA has already been established in Indonesia, Singapore and Thailand to evaluate health technologies and to inform policy decision-making.

The use of big data in the health sector has received little attention in Asia. A few recent examples, both in China, include the development of sophisticated algorithms to identify potential outbreaks based on analysis of search engine use and surveillance systems for diseases (e.g. TB) with web-based electronic recordings from all health facilities (*see* Chapter 4).

Enhancing the regional governance mechanisms for health

Regional organizations such as WHO's two regional offices, ASEAN and SAARC, are in a good position to promote regulatory convergence, and common rules and standards in collaboration with other global health agencies. The two WHO regional offices have acted as a platform for collective action and sharing of resources on health issues and disaster management. SAARC's scope of work includes a TB and HIV centre, which supports national TB and HIV control programmes. ASEAN, through its post-2015 health development agenda, is harmonizing its regional activities, encouraging better collaboration on health between its member states and linking these actions with the Sustainable Development Agenda (ASEAN, 2016).

Despite what has been achieved in the health sector, there are many areas where further collaboration and convergence could be useful. For example, further national commitment and champions will be needed to develop common rules and standards, and regional regulatory frameworks. The IHR (2005) are a good example of a legally binding instrument of

international law that can facilitate a platform for regional collaboration on health.

Finally, as new trading agreements such as the Regional Comprehensive Economic Partnership (RCEP) or the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) come into effect, there will be new pressures on countries to open up their borders for trade in goods and services. This will have an impact on health by potentially lowering tariffs on products harmful to health such as tobacco and alcohol, as well as limiting the ability of countries to use flexibilities available to them under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Regional governing bodies are an important conduit to ensure that ministries of health are aware of such consequences and can provide appropriate input into national trade-negotiating processes.

Asia has made substantial achievements in strengthening regional governance for health. However, as Spencer et al. warn in Chapter 1, “trading agreements, differences between national health sectors, levels of political will and commitment, legal and regulatory environments, and health information systems pose significant challenges to regional health cooperation” (*see* Chapter 1).

Addressing the multisectoral nature of health

A more holistic, multisectoral approach is needed to address the challenges of population health in Asia. The WHO Commission on Social Determinants of Health emphasized that interventions that improve health need to focus on wider determinants (CSDH, 2008). This is also illustrated in the SDG targets, where in addition to the 13 health-related SDG 3 targets, nine additional targets described in other SDGs are also health related (Nunes et al., 2016; WHO, 2017).

The Planetary health chapter aims to widen the concept of multisectoralism and provides positive examples in the region. For example, it describes the national campaign Healthy China 2030, which proposes a health-in-all-policies and cross-industry collaboration. Other examples include Thailand, where the National Health Assembly has been working across sectors,

including public, private, academia and civil society, adopting a “Health in All Policies” philosophy to pass resolutions that often deal with the economic and social determinants of health.

Asian universities could also play a key role in training the new generation of health professionals and public health researchers to adopt a multisectoral approach in their future careers. Overall, addressing population health, including the social, political and commercial determinants of health, demand a whole-of-society approach that should include governments, civil society, academia, industry and communities across a wide range of sectors to co-produce health.

Future developments and challenges

In this book, we have provided many examples of innovative, people-centred and resilient activities taking place across the region to highlight that positive steps have been taken across Asia. However, health systems in Asia are facing many challenges and much more needs to be done to design the health systems of the future, in view of the ecological, epidemiological, demographic, economic, urban and nutritional transitions that are affecting Asian countries.

To assure people-centredness and resilient health systems, we need a paradigm shift in how institutions are organized and the values that are upheld within health systems, with much more power being redistributed to patients and other health-care providers such as nurses, pharmacists, CHWs and the community as a whole.

While we acknowledge that health systems need to find context-specific solutions to address their specific needs, we have identified certain activities that could be beneficial for all health systems. This includes a motivated and well-trained health workforce; a focus on sustainable and equitable financing; an integrated health systems approach with primary health care at the forefront; and adopting new technologies, products and information systems to reinvigorate and integrate health systems as a whole. Countries in Asia will have to work collaboratively to devise sustainable and multisectoral approaches. Overall, addressing population health, including the social, political, and commercial determinants of health, demands a

whole-of-society approach that should include governments, civil society, academia, industry and communities across a wide range of sectors.

All countries in Asia are striving to achieve UHC within the Sustainable Development Agenda. Progress in this area in the coming years will be key to preparing the health systems of the future. We hope the vision of achieving inclusive UHC across Asia with health systems that are people-centred, resilient and of good quality becomes a reality for our future generation.

We also hope that this book will serve as a robust source of evidence that can be of assistance in developing local expertise in health systems, and generate innovative and effective solutions to enhance health systems in Asia.

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