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Research Article

Reorienting Health Services to People with Chronic Health Conditions: Diabetes and Stroke Services in Malaysia, Sri Lanka and Thailand

Vasoontara Yiengprugsawan ^{1,2,*}, Judith Healy³, Hal Kendig^{1,2}, Malinee Neelamegam⁴, Palitha Karunapema⁵ and Vijj Kasemsup⁶

¹Centre for Research on Ageing, Health and Wellbeing, Research School of Population Health, The Australian National University, Canberra, Australia

²Australian Research Council Centre of Excellence in Population Ageing Research (CEPAR), Canberra, Australia

³School of Regulation and Global Governance (RegNet), The Australian National University, Canberra, Australia

⁴Department of Epidemiology & Biostatistics, College of Public Health, University of South Florida, Tampa, FL, USA

⁵Ministry of Health, Colombo, Sri Lanka

⁶Department of Community Medicine, Faculty of Medicine, Ramathibodhi Hospital, Bangkok, Thailand

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Abstract—This paper explores whether middle-income Asian countries are reorienting their health services in response to non-communicable diseases (NCDs). Malaysia, Sri Lanka, and Thailand were selected as case studies of Asian societies experiencing rapid increases both in NCDs and an aging population. While NCD programs, especially those related to diabetes and stroke, are well-established in Thailand, health services struggle to respond to increasing numbers of people with chronic health problems. Health services at all levels must plan ahead for more patients with chronic and often multiple conditions who require better integrated health care.

INTRODUCTION

Middle-income countries in south and southeast Asia, such as Malaysia, Sri Lanka and Thailand, can expect rapidly aging societies over the next few decades as well as an increase in the burden of non-communicable diseases (NCDs). The most common conditions are cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases.¹ Chronic conditions such as these, along with population aging, present a challenge to health systems that are typically not designed to address the needs of people with long-term and multiple health conditions.^{2,3} While infectious disease and acute conditions remain important in these countries, health services also need to develop strategies for a changing patient population with different health needs.^{4,5} The main question

Keywords: Middle-income Asian countries, non-communicable disease, NCDs, elderly patients, primary health care, health services, diabetes, stroke

*Correspondence to: Dr. Vasoontara Yiengprugsawan, Email: vasoontara.yieng@anu.edu.au; vasoontara.yieng@gmail.com

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explored in this paper is whether the middle-income Asian countries of Malaysia, Sri Lanka and Thailand are reorienting their health services to respond to non-communicable diseases, such as diabetes and stroke.

The Global Burden of Disease study attributes the growing NCD burden both to an increase in risk factor prevalence, such as obesity, and to growing numbers of older people.¹ Addressing increases in NCDs and a growing population of older people requires health systems to respond with services that range across prevention, early intervention and treatment. The World Health Organization stresses two key NCD strategies: prevention involving the reduction of common risk factors, and early intervention and treatment of chronic conditions with both these strategies built upon a strong foundation of primary health care.^{4,6} Countries in southeast Asia facing an epidemic of NCDs, for example, are urged to redesign their health systems around greatly strengthened primary health care.

Accordingly, the WHO Package of Essential NCD Interventions (WHO PEN) identified a set of cost-effective interventions for primary care in low-resource settings,⁷ and set out a step-by-step risk surveillance tool that a country could adapt to its needs and resources. The STEPwise approach to surveillance of NCD risk factors (STEPS) aims to assist low and middle-income countries build capacity to conduct surveillance and risk factor assessments.⁸ This includes collecting information on risky behaviors (e.g., tobacco and alcohol use, physical inactivity), physiological measures (e.g., weight and height), and biomedical measures (e.g., blood sugar and blood lipids).

NCD prevention policies focus on the reduction of risk factors such as harmful use of alcohol, insufficient physical activity, excess intake of salt, tobacco use, raised blood pressure, and obesity. The *Global Action Plan for NCDs 2013–2020* sets out global targets for a reduction in such risk factors and urges each country to set its own achievable targets for its population aged under 70 years.⁹ HelpAge International has pointed out, however, that a focus upon prevention among younger adults should not overlook the fact that both prevention and treatment services should also be better oriented toward older people since half of deaths from NCDs occur in this age group.¹⁰

MATERIALS AND METHODS

Three countries were selected to explore a range of health system responses among middle-income Asian countries. Malaysia, Sri Lanka, and Thailand have greater than 10% of their populations aged 60 years or over, are rapidly aging societies, and face an increasing NCD burden. This paper

draws on a larger study of NCDs in middle-income Asian countries,¹¹ which includes case studies on Sri Lanka¹² and Thailand,¹³ with information on Malaysia drawn from reports and published research. Comparative data on the three countries were drawn from international databases (for example, Institute of Health Metrics 2015). National data and information were drawn from reviews of country health systems published by the Asia Pacific Observatory on Health Systems and Policies.

This paper is exploratory as there are fewer comparable data and less published material and analysis to draw upon from middle-income Asian countries compared with high-income countries. The study was developed in the broader context of informing health system adjustments and developments in response to the rapid changes underway in the health profiles and other social changes underway in Asia. The case studies on Sri Lanka and Thailand were undertaken by in-country experts using a template asking about NCD and aging policies and population trajectories, and for a summary and assessment of health services in relation to NCDs, in particular diabetes and stroke. These country authors also drew upon expert informants through interviews with around 20 health professionals in each country and a small number of patients.

This study selected two tracer (also termed marker or sentinel) conditions that offer focal points as a way to assess the performance and innovations of the health systems. Diabetes and stroke as NCD conditions are broadly amenable to health service intervention and thus were selected as indicators to trace the extent and effectiveness of NCD health services. These two conditions afflict an increasing number and proportion of people aged 60 years and over in middle-income Asian countries.

We explore to what extent the three countries are implementing “good practice” policies and programs as identified in the international literature.^{2,4,14–16} While much of this literature is based on high-income countries well advanced in demographic and epidemiological transitions, several broad themes are relevant to our study countries in relation to their implementation of NCD policies and programs. These include national policies and programs to address NCDs; monitoring the population prevalence of NCDs; risk factor reduction programs; equity in health care access; integration across levels of health care (primary, secondary and tertiary); engagement of the private sector in NCD prevention and treatment; strengthening primary health care as the foundation of NCD health service; and better clinical management for patients with multiple and long-term conditions. Our focus therefore is on a range of potential actions—mainly in the government health sector—that are potentially important

for the prevention, amelioration or treatment of NCDs as they gain increasing importance with the shifting health profiles of rapidly transitioning countries in Asia.

RESULTS

Country Profile and NCDs in Adult Populations

People in each of the three countries can now expect to live to over 70 years of age with women outliving men by about six years: for example, life expectancy in Thailand is nearly 72 years for men and 78 years for women (Table 1). Thailand has the oldest population of the three countries with those aged 60 years and over accounting for 16% of its population in 2015, and expected to rise rapidly to 37% by 2050.¹⁷ Malaysia has the youngest population with those aged 60 plus projected to rise from 9% of the total population to 24% by 2050.¹⁷

NCDs have become the major cause of death and disability among older adults in the three countries. The Global Burden of Diseases database shows that NCDs in 2015 contributed to a similar proportion (around 80%) of total deaths for the 50–69 age group and for the 70 years and over age group (Table 2). Cardiovascular diseases, cancers and diabetes were the top three NCD conditions in all three countries for both age groups. Malaysia had the highest death rate per 100,000 from cardiovascular diseases for both age groups while Sri Lanka had the highest death rate from diabetes for the 70 plus age group. Death rates were higher among those aged 70 years and over for all NCDs (except liver diseases)

compared with those aged 50–69 years. NCDs generally also limit years of healthy life through ongoing poor health and disability.

NCDs generally share common behavioral and metabolic risk factors so monitoring these factors from middle age onwards is vital for both prevention and early treatment. For example, diet and high blood pressure, both risk factors for NCDs, were ranked high across the three countries for both adult age groups and for men and women (Table 3). These risk factors indicate target areas for promoting both environmental and personal behavioral changes.

The World Health Organization has a framework to monitor progress on the nine global targets for reducing NCDs among the population under 70 years. As of 2015, Malaysia, Sri Lanka, and Thailand reported that they were on their way to achieving national NCD reduction targets.¹⁸ The three countries all have plans to reduce cardiovascular diseases, diabetes, tobacco use and to increase physical activity, but reducing the consumption of salt, saturated fats and alcohol appears more difficult (Table 4). As the following country case studies go on to show, however, plans are important but are not easily implemented.

Malaysia

Malaysia's health system is financed mainly through general revenues, with the public proportion being 55% of total health expenditure in 2014 (Table 1). Equity is an increasing concern as the fast-growing private sector is funded principally

Indicators	Malaysia	Sri Lanka	Thailand
Income classification (World Bank)	Upper middle	Lower middle	Upper middle
Population (millions) 2015	30.3	20.9	67.9
Gross National Income per capita PPP (current international US\$) 2015	\$26,190	\$11,480	\$15,210
Urban population, % of total	75%	18%	50%
Population aged 60+ (% of total), 2015**	9%	14%	16%
Projected population aged 60+, 2050**	24%	29%	37%
Life expectancy at birth (males) 2015*	72.7	71.6	71.9
Life expectancy at birth (females) 2015*	77.3	78.3	78.0
Healthy life expectancy, 2015*	66.5	66.8	67.0
Fertility rates, 2014 (births per woman)	1.9	2.1	1.5
Universal health coverage	Yes	Yes	Yes
Health expenditure per capita PPP, 2014	\$1,040	\$369	\$950
Total Health Expenditure (THE % of GDP), 2014	4.2%	3.5%	6.5%
Health expenditure (public % of THE), 2014	55%	56%	86%
Out-of-pocket health expenditure (% THE 2013)	35.3%	42.1%	7.9%
Physicians per 10,000 population (2007–2013)	12.0	6.8	3.9
Nursing and midwifery per 10,000 population (2007–2013)	32.8	16.4	20.8
Hospital beds per 1,000 population	3.6 (2012)	1.8 (2012)	2.1 (2010)

TABLE 1. Socio-Demographic and Health Country Profile. Sources: Adapted from Refs. 17, 49, 50

Death rates (per 100000) both sexes	Malaysia		Sri Lanka		Thailand	
	50–69	70+	50–69	70+	50–69	70+
Cardiovascular diseases	432.6	2606.1	315.6	2386.9	235.3	1907.5
Neoplasms	218.4	786.6	148.3	474.0	371.7	1327.7
Diabetes and other endocrine conditions	94.4	406.4	122.4	802.4	135.1	779.7
Chronic obstructive pulmonary diseases	32.8	323.2	46.0	241.1	51.7	362.1
Cirrhosis and other liver diseases	29.0	63.2	73.3	70.7	56.6	98.5

TABLE 2. Non-Communicable Diseases and Causes of Death by Older Age Groups, 2015. Source: Adapted from Ref. 1

through rising out-of-pocket payments (35%) from patients.¹⁹ Malaysia has undergone rapid economic transition with 75% of the population now living in urban areas. Annual health expenditure is 4.2% of GDP and per capita health expenditure is highest of the three countries (Table 4).

Public sector hospitals and health centers are administered by the Ministry of Health. Public primary care facilities were expanded in earlier decades in rural areas, but in urban areas have not kept pace with the movement of people to cities and patients often encounter long waits.²⁰ The public sector provides most inpatient care (82% of admissions), while private sector clinics mainly located in urban areas now provide most ambulatory care (62% of consultations).¹⁹

The private health sector concentrates on curative care, rather than health promotion and NCD prevention, in physician clinics (about 6000), private hospitals, diagnostic laboratories and pharmacies. Many people, particularly the elderly, also use traditional medicine, such as Chinese and Malay practitioners and products.²¹

The supply of physicians and nurses compares well to the other two countries (Table 4). Malaysia allows dual practice in both public and private sectors to retain physicians in the public sector. Most public physicians work in hospitals not primary care, with less than 10% used in public primary care

centers.¹⁹ Nurses are the backbone of primary health care and public services and two-thirds of trained nurses work in the government sector.²² The government has increased the number of training places for both physicians and nurses over the last decade.

Public primary care clinics are linked to hospitals and tertiary care centers through a referral system, although people often bypass primary care and go directly to higher levels of care. Centrally administered by the Ministry of Health, public health services follow standard procedures and clinical protocols, but a recent survey of public primary care services found inequities in distribution and quality.²¹ For example, primary care centers in urban compared with rural locations had more doctors and allied health professionals, and rural centers had fewer diagnostic facilities and equipment.

In relation to NCD programs generally, Malaysia undertakes regular population health surveys and has adopted risk factor surveillance based on the STEPwise approach.⁸ The Malaysian National Health and Morbidity Survey in its assessment of NCD risk factors in the population reports an increase in the prevalence of obesity, diabetes and hypertension.²³

Malaysia has implemented a series of NCD-related policies and strategic plans. After a 2007 review of the primary

Risk factors	Malaysia				Sri Lanka				Thailand			
	Males		Females		Males		Females		Males		Females	
	50–69	70+	50–69	70+	50–69	70+	50–69	70+	50–69	70+	50–69	70+
Dietary risks	1	1	1	2	1	1	1	2	2	2	1	1
High systolic blood pressure	2	2	2	1	8	2	2	1	4	3	3	2
High fasting plasma blood glucose	5	4	4	3	2	3	3	3	5	5	2	3
Tobacco	3	3	6	5	3	6	8	9	1	1	5	5
High total cholesterol	4	5	5	4	5	5	6	5	8	8	9	7
High body mass index	6	7	3	6	7	9	4	6	7	9	4	8
Air pollution	7	6	7	7	6	4	5	4	6	4	7	4
Alcohol and drug users	9	11	11	11	8	10	10	11	3	7	8	9
Low physical activity	8	9	9	9	10	8	9	8	12	11	11	10

TABLE 3. Ranking of Risk Factors for Deaths from Non-Communicable Diseases, by Sex and Older Age Groups, 2015. Sources: Adapted from Ref. 1

Indicators	Malaysia	Sri Lanka	Thailand
Has an operational unit, branch, or department in Ministry of Health with responsibility for NCDs ¹	Yes	Yes	Yes
Has an NCD surveillance and monitoring to enable reporting the 9 global NCD targets	Yes	Yes	Yes
Has an operational policy/strategy/action plan for cardiovascular diseases	Yes	Yes	Yes
Has an operational policy/strategy/action plan for diabetes	Yes	Yes	Yes
Has any policies to reduce population salt consumption	Yes	No	No
Has national policies on saturated fatty acids/ trans fats	No	No	No
Operational policy/strategy/action plan to reduce the harmful use of alcohol	No	Yes	Yes
Operational policy/strategy/action plan to decrease tobacco use	Yes	Yes	Yes
Operational policy/strategy/action plan to increase physical activity	Yes	Yes	Yes

TABLE 4. National Capacity for Non-Communicable Diseases. ¹Countries who have a “Yes” for this indicator have responded “Yes” to the question “Is there a unit/branch/department in the ministry of health or equivalent with responsibility for NCDs?” and the subsequent question “Is there at least one full-time person / staff member working on NCDs?.” Additionally, the countries had to say “Yes” to “Is there funding for the following NCD activities/functions?” for each of the following functions: primary prevention and health promotion; early detection/screening; health care and treatment; and surveillance, monitoring and evaluation. Sources: Adapted from Refs. 51 and 52

care system, the Ministry of Health began the process of reorienting health services to NCDs, using a “Reviewed Approach” framework.²⁴ This included strengthening NCD screening services and early stage interventions (borderline hypertension, overweight, glucose intolerance).

Under the “National Strategic Plan for Non-Communicable Disease 2010–2014”,²⁵ the Ministry of Health collaborates with the Malaysian Health Promotion Board and undertakes screening and intervention in the community, school and workplace,²⁶ and works with community partners, such as village-level health volunteers. Health promotion activities are further pursued through Advisory Panels attached to public primary health centers that involve local community leaders.

The Ministry of Health has issued national guidelines/protocols for NCD management, including for use in public primary health clinics to address six main risk factors: physical activity and exercise, healthy eating, weight reduction, smoking cessation, stress management, and alcohol use.²⁴ Government primary health centers aim to implement NCD prevention initiatives, such as educating people on food choices and diet-related health problems.^{19,27}

In relation to diabetes services, according to DiabCare 2008, most patients with diabetes were screened for complications at public centers and hospitals (April to December 2009): 68% had eye screening, 48% had foot screening, and 97% had nephropathy screening.²⁸ For cases without complications, the patient generally is treated at a primary health center, and more serious cases are referred to a physician at a community hospital or to specialists at a provincial or regional hospital. The establishment of the National Diabetes Registry has improved NCD management in public clinics.

Most large hospitals have trained diabetes nurse educators, however patients pay insufficient attention to lifestyle recommendations, given only 12% adherence for diets, 39% for exercise, and 42% for self-testing of blood sugar level.²⁹

Stroke is an important health problem for Malaysia given the high rate of cardiovascular disease among its 70 plus population (Table 2), and the high-risk factor ranking for blood pressure (Table 3). A longitudinal incident study reported that men have a higher age-adjusted stroke incidence rate compared with women.³⁰ More than half of the public sector hospitals offer acute stroke care and post-stroke rehabilitation. A study of hospital records, however, showed that only 16% of patients arrive within the recommended therapeutic window of 4.5 hours, and that treatment was further delayed or impaired by inadequate communication between health professionals.³¹

Community awareness programs aim to improve early detection of stroke symptoms and timely health seeking behavior, both of which can significantly determine favorable post-stroke outcomes. Several large hospitals now provide a dedicated stroke unit. Most stroke survivors are discharged to their homes with instructions for follow-up care by either a specialist clinic or a primary care clinic.³² However, the primary care team often receives inadequate instructions from specialists on patient management.³³ A survey of family medicine physicians in public primary care clinics found that 72% did not have a care plan for their stroke patients.³³ Traditional and complementary medicines have been integrated into several public hospitals and approximately 70% of stroke patients also use traditional medicine for rehabilitation.³⁴ The National Stroke

Association of Malaysia, a non-profit organization, also offers stroke rehabilitation services.³⁵

Sri Lanka

Historically, the public sector in Sri Lanka has played a major role in the provision of health services. However, among the three countries it has the lowest aggregate spending on health, whether measured in per capita terms or as a share of GDP (Table 1). Public expenditure accounts for over half of total health expenditure, but out-of-pocket payments of around 42% of total health expenditure are high. Primarily still a rural country, only 18% of the population lives in urban areas and per capita income is lowest of the three countries. Public sector health services are administered by the Ministry of Health, with public primary health care organized around a local hospital model. These local (divisional) hospitals have an outpatient department and 25–100 inpatient beds plus outlying small medical units.

Outpatient departments at public primary and secondary care hospitals are overcrowded with long waiting times, so that care generally is not regarded as high quality, given rushed staff, lack of clinical adherence to treatment protocols, and shortages of equipment and medication.¹² Continuity of care is poor since patients are not assigned a designated doctor, the referral system is not enforced, and people often go directly to higher-level facilities. NCD patients attend monthly clinic appointments partly to renew prescriptions and collect drugs from the hospital pharmacy. Some clinical informants thought that clinic visits should be reduced to once every 2–3 months for many patients and so allow doctors to spend more time with patients.

The private health sector provides mainly curative care in clinics and hospitals. Private health services have grown since the 1980s and mostly are located in urban areas. Up to 60% of ambulatory patient consultations now occur in private clinics, including a small number with Ayurvedic practitioners.¹² Many doctors work in both the public and private sector, given Sri Lanka's dual practice policy.³⁶ Very few doctors, perhaps about 5% of the total Sri Lanka, work solely in the private sector.³⁷ Informants regarded dual practice, by general practitioners in particular, as the backbone and "hidden strength of our health system."¹²

While high out-of-pocket payments (OOP) are inequitable, "catastrophic health expenditure" is not high given extensive public services,^{38,39} and because most out-of-pocket payments are for ambulatory not inpatient care. A survey asking people about why they sought private care reported that although cost was a concern, the main reasons

were convenience, with choice of doctor and continuity of care especially important for those with chronic conditions.³⁷

The Ministry of Health announced an NCD plan in 2010 with its own budget line to "reduce premature mortality (less than 65 years) due to chronic NCDs by 2% annually over the next two years."¹² The rationale for the 65-year upper age limit is not known given rising life expectancy (e.g., life expectancy for women in Sri Lanka is now 78 years). Informants said that the implementation of NCD strategic plans generally was inadequate given few technical experts were available at central level.¹² Sri Lanka has adopted the PEN guidelines, and while public primary care facilities previously lacked adequate equipment, medicines and trained staff, the extra NCD funds have improved their capacity.¹² Sri Lanka has also adopted risk factor surveillance based on the STEPwise approach to NCDs, with STEP surveys for NCD risk factors conducted in 2006 and 2014.¹²

Small primary health facilities lack staff trained in NCD prevention and early intervention. The Ministry of Health has established about 800 "Healthy Lifestyle Centers" based in local public hospitals since 2011 where people aged 35 and over are screened for NCDs and advised how to reduce their health risk factors. People over the age of 65 years are not eligible in line with Ministry of Health NCD policy.^{40,41} Some informants thought these centers were under-used resulting in only a small proportion of the population being screened for NCD risk factors.¹²

Sri Lanka has higher population prevalence of diabetes and endocrine conditions than the other two countries, particularly for populations aged 70 years and over (Table 1).^{42,43} The risk of such conditions, particularly type 2 diabetes, is higher among South Asians, although the extent of genetic contribution is still unclear.⁴⁴ Surveys have found an adult diabetes prevalence rate of over 10% although more cases were likely to be undiagnosed.⁴² Most secondary and tertiary care hospitals have diabetic clinics managed by a general physician or endocrinologist, and many have nurse educators.¹² Other diabetes projects include the National Initiative to Reinforce and Organize General Diabetes Care (NIROGI) set up by the Sri Lanka Medical Association in collaboration with the Ministry of Health, which offers foot care for diabetic patients.¹²

Stroke services are less advanced. While all secondary and above hospitals treat stroke patients only eight hospitals (at national and provincial level) have specialist stroke units and post-stroke rehabilitation is limited.¹² There are insufficient beds for stroke patients and the country lacks sufficient specialists and multidisciplinary staff.⁴² Stroke can be a catastrophic event that affects the whole family but patients often

are discharged home early without an adequate post-discharge plan and are left to the care of their over-burdened families.

While Sri Lanka has more hospital beds and a comparatively good supply of health professionals for its population (Table 1), there are shortages of NCD-related sub-specialties, including endocrinologists, stroke specialists, geriatricians and allied health professionals, such as physiotherapists, occupational therapists and speech therapists.⁴³

Informants reported that hospitals were inclined to give priority to younger patients with acute medical problems and a better prognosis. The current generation of older people are said to not worry much unless chronic conditions are painful or affect day-to-day activities. Overall, they are reported to be tolerant of bad health, in line with Buddhist religious teaching, accept serious health events as inevitable, and have lower expectations of health services than younger people.¹²

Thailand

Thailand announced a policy of universal health coverage in 2002 and has steadily extended coverage through social health insurance schemes and initially low co-payments (30 Baht fee per visit which was later abolished) for health services. Thailand spends the most on health care among the three countries as a proportion of GDP, and with the largest share of public sector spending. Out-of-pocket payments by patients are low at 7.9% of total health expenditure (Table 1).

The Ministry of Public Health is the main health service provider through an extensive network of public hospitals and health centers.^{13,45} The private sector has been expanding with many clinics and more than 300 hospitals (22% of total hospitals) that offer care to those who can afford to pay. According to the Health and Welfare Survey 2013, people seek ambulatory services mainly from the public sector with only a small proportion from private clinics (15%).⁴⁶ Thailand has a dual practice policy, so many public sector doctors run their own private clinics outside government employment hours. Private health insurance is voluntary and several national and international funds offer coverage. The Thai government promotes medical tourism mainly provided at large private hospitals.⁴⁷

The Ministry of Public Health has adopted disease prevention and health promotion as one of four national health strategies for the next 20 years, including a plan to reduce NCD risk factors. The Health Promotion Foundation (ThaiHealth), an institute funded through a 2% tax surcharge on tobacco and alcohol, also funds programs to reduce NCD risk factors. ThaiHealth funds governmental agencies, the private sector, NGOs, and professional groups. For example, ThaiHealth

supported the Royal College of Physicians in setting up a network of physicians to advise people to be more physically active, eat healthily, and control weight, called the “Network of Fatless Belly Thai,” which uses waist circumference as a simple indicator to the general public.

Thailand has increased its relatively low supply of physicians since doubling the number of medical graduates from 2009 onwards.⁴⁵ Medical education still focuses on traditional areas, such as acute hospital care, with less attention to primary health care and NCD management.¹³ As general physicians will remain the main source of NCD care, training programs are required in different aspects of NCD and elder care. Additional allied health professionals will also be needed in the future, including almost a doubling of the number of physiotherapists currently available in Thailand by 2020.¹³

Primary care is well developed in the public sector and thus offers a strong base for NCD services. Over 9000 Tambon Health Centers at the sub-district level provide primary health care and act as gatekeepers to higher levels of care (although some patients still bypass local facilities). Each center, staffed by nurses and visiting doctors, is equipped with essential drugs and simple tools to screen for NCDs, for example, measuring blood sugar and blood pressure. About one million health volunteers nationwide work under the supervision of health center staff to help screen for NCDs. In a notable recent initiative, the Thai Government has introduced a community care model based on a scheme in the Lam Sonthi District, Lopburi Province, where local health and social care agencies combine to undertake case management of dependent people living at home, and also pay a small wage to village caregivers.

Thailand undertakes regular population health surveys including on NCDs. The National Health Examination Survey undertaken every five years since 2004 includes questions on the prevalence of diabetes, while annual surveys monitor the care provided by hospitals for specific conditions. Thailand therefore already had a well-established risk factor surveillance and monitoring program in line with the STEPwise approach to NCDs.⁸ The prevalence of diabetes mellitus among adults was 6.9% in 2009: indications of success being a similar level of prevalence to 2004, more people being aware of their condition, and diabetes cases being better controlled.¹³

Diabetes mellitus services (and other service areas) are organized according to regional plans developed by the Ministry of Public Health, which set out procedures for referral, consultation and staff training. Diabetes care is well-integrated across all levels of health services. At primary care level,

people aged 35 years and over with diabetes symptoms are screened by staff and health volunteers at Tambon health centers. Non-complicated cases are treated by nurses and other cases by doctors, or referred onwards to district hospitals. Some public hospitals have organized for patients to obtain medicines at private pharmacies rather than their crowded public hospital dispensaries. Other government programs include mobile eye care clinics for remote areas, partly to address diabetes retinopathy.⁴⁸ The National Health Security Office (the national health insurance funder) reimburses diabetes patients for comprehensive annual check-ups, and sponsors a training program in diabetes care for health professionals. Thousands of health professionals have been trained in diabetes and foot care in a public-private partnership between the Ministry of Public Health and Theptarin Hospital, a large private hospital with a specialist multidisciplinary team.

Stroke is the leading cause of death and disability and so has received considerable attention over the past decade. The Stroke Fast Track program was launched in 2008 to ensure that people with acute ischemic stroke were quickly given intravenous thrombolytic treatment to reduce brain damage and to improve subsequent quality of life.¹³ A central hospital in each of the 13 regions provides information on stroke management and trains staff, with over 110 hospital stroke units now throughout the country, which generally provide some rehabilitation to patients before discharge. Regional hospitals remain over-crowded, however, and post-discharge planning needs improvement: more stroke patients should be referred back with care plans to local hospitals, primary care units and to their communities.

DISCUSSION AND CONCLUSIONS

Primary care generally is regarded as the mainstay of NCD services and while all three countries already have well-established public primary care services, these services face several pressures. These pressures include growing numbers of people with NCD conditions, and the growth of the private sector. Increasing numbers of people in each country consult private practitioners, who generally provide curative rather than preventive care. NCD programs therefore require better integration between public and private sectors, which could build upon widespread dual practice by physicians.

The delivery of primary care in each of the three countries also differs somewhat in structure and level of funding. Thailand has well-established and well-integrated NCD programs delivered partly through its large network of public primary health care centers, which are staffed by trained nurses and sessional doctors and also involve community

volunteers. Malaysia must respond to population movements by improving the supply of public primary health care to urban areas. Sri Lanka, with its predominantly rural population, mainly provides public primary care through many small local hospitals which still lack sufficient drugs and equipment. Hospital services in the three countries generally remain based on a specialist model around a dominant consultant rather than a more multidisciplinary model geared to multiple conditions, although Thailand now engages in more multidisciplinary teamwork.

All three countries have adopted NCD risk factor surveillance and screening based on the STEPwise approach to NCDs,⁸ although in Sri Lanka this occurs more at the level of the local hospital than at the community level. All three countries have promulgated protocols on the prevention, screening and management of diabetes and stroke, but the take-up by clinicians varies and is said to be poor in Sri Lanka. NCD care requires integration across all levels of health care: primary care screening of risk factors, timely intervention at secondary and sometimes tertiary and rehabilitation levels, and hospital discharge referrals back for management by primary care.

Integration of care is crucial in stroke care, for example, since a speedy response to a stroke event is critical. Collaboration between hospital and primary care remains problematic, while late arrival by the patient at hospital limits the effective use of thrombolysis (anti-blood clotting drugs) in ischemic stroke. Thailand, therefore, has set up fast track stroke services within regions. Post-stroke continuity of care between a hospital and primary care also needs attention. Despite protocols on diagnosis, treatment and sometimes post-stroke discharge and rehabilitation, in practice many patients are sent home early from hospital without a discharge plan sent to primary care professionals and with little information or support given to the patient and family.

All three countries have begun to reorient their health services to respond to increasing population rates of non-communicable diseases, in relation to services for diabetes and stroke patients. Thailand, in particular, has well-established diabetes and stroke services. There is less evidence, however, that NCD health services are planning ahead on how best to treat many more elderly patients. NCD screening programs focus on people aged under 70 years, while Sri Lanka concentrates upon people below the age of 65 years. While early prevention is seen as a cost-effective strategy, it is important for health systems to keep in mind that most people seeking treatment services will be elderly.

Three main challenges emerge from this overview of health services in the three countries for patients with

diabetes and stroke conditions: the need to strengthen primary health care, to better integrate services for patients with NCDs, and to train and retrain staff to respond both to NCDs and to older patients.

Developing primary health care is a priority for responding to NCDs and responding to older populations, in terms of its potential to undertake health promotion, disease prevention, early treatment and ongoing management. Middle-income countries in Asia, therefore, urgently need to strengthen their primary health care sector if they are to meet the health needs of NCDs and rapidly aging populations. This is so for several reasons. First, many chronic conditions are better managed in the community by primary care providers rather than in hospital admissions. Second, much chronic disease can be managed more cost-effectively by primary care rather than by expensive hospital care, including care of patients following hospital discharge. Third, public sector primary care in the local community is more accessible and equitable for several groups of people: rural people, poor people and elderly people (often one group), who have very low incomes, may lack transport, and who find it difficult to navigate the distances and cost barriers involved in hospital services.

Public primary care services are under considerable strain in the three countries given staff shortages. Long waits are common also for outpatient and dispensary services at secondary care public hospitals. In contrast to the stricter gatekeeper role of primary care in Thailand, patients in Malaysia and Sri Lanka often go directly to specialists without a referral from primary care physicians. Lack of doctors, medications and investigation facilities are common reasons for patients to bypass primary care for hospitals or private doctors.

Integrated care is crucial for patients with chronic and often multiple conditions in relation to early intervention and ongoing management. People should be able to move easily between different parts of the health care system, for example, timely efficient referral in the case of stroke. Better integrated health care may be achieved through co-location of multipurpose services (e.g., a multiservice health center), continuity of health care by a designated physician, and across different services (e.g., linking up health centers and district hospitals). Health care also needs to be better integrated with community and family care. The Lam Sonthi community care project and its roll-out in Thailand offers a good example. In all countries, however, despite large numbers of patients seeing private physicians, there is little NCD service integration between the public and private sectors.

Staff require training and retraining to improve their knowledge, skills and attitudes in relation to patients with

chronic conditions. General physicians will continue to provide most medical care, but more specialist training is needed in relation to NCDs such as for diabetic and stroke care, and more NCD specialists will be needed in future who have geriatrics training. The Sri Lanka Medical Council and the Royal College of Physicians of Thailand have begun training programs for geriatricians, and Malaysia is looking to strengthen geriatric medicine and elder care training of general physicians and nurses. The mix of staff also requires further consideration, such as expanded functions for nurses and allied health professionals in NCD and elder care.

DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

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ORCID

Vasoontara Yiengprugsawan  <http://orcid.org/0000-0001-9101-4704>

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