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HETEROGENEITY IN NEUROLOGIC EDUCATION AND CARE IN ASIAN AND OCEANIAN REGION

The Asian subcontinent and Oceania (comprising islands in the Pacific Ocean) are home to more than 60% of the world's population. The burden of neurologic disease and sickness is thereby high and medical care is in high demand. There are many developing countries with diverse cultural, economical, political, religious, and historical backgrounds within the Asian and Oceanian region.^{1,2} Recently, enhanced medical care in these developing countries has resulted in greater longevity, which has increased the burden on those providing health care. The prevalence of neurologic illness has also increased and has emerged as a priority health problem.³ Most frequently reported cases in neurology are epilepsy, cerebrovascular disease/stroke, headache, Parkinson disease, neuropathies, neuroinfections, multiple sclerosis, Alzheimer disease, and other dementias.

Government and private investment in the health sector and training of medical graduates is a vital aspect of health care, as it greatly assists in provisioning services to the ever-growing population. One of the indicators of health financing that summarizes national (government and private) expenditure on health in a given year is the total expenditure on health as a percentage of gross domestic product (GDP). The figure compares the total expenditure on health as a percentage of GDP (2011) and population (2009) in some of the countries in the Asian and Oceanian region.¹

Poor economic growth has led to less budget allocation to the health care sector in the Asian and Oceanian regions and developing countries have a long way to go to be at the level of developed countries in provisioning of neurologic care. The gap is widened by the lack of emergency medical teams, 911 providers, and ability to treat patients with clot busters such as IV recombinant tissue plasminogen activator. Barriers to the successful delivery of health care in the Asian and Oceanian countries are high population burden, cultural and religious barriers, lack of adequate training programs in neurology, and inadequate ancillary staff such as nurse practitioners. Other obstacles include limited sustainable

and basic resources—particularly in rural areas—that include staff, infrastructure, equipment, and medications. There are also practical constraints including travel on difficult terrain that hamper access to neurologic consultations.

Some of these limitations are specific to neurology. In light of these deficiencies, the WHO has launched projects to encourage health ministries worldwide to promote health education and acknowledge neurologic disorders such as stroke as a major public health problem. The WHO is also attempting to make neurologic services readily available at all levels of the health system. The table compares the neurology training, eligibility, duration, and number of neurologists/million population in some of the developed and developing countries of the Asian and Oceanian region.^{1,2}

Bridging gaps. In our review of existing deficiencies within medical systems in the region, we have identified several necessary steps to bridge gaps in neurologic care and improve the quality of neurology training.

A powerful tool for overcoming barriers to providing adequate neurologic care is effective education and training with mandates to serve in areas that are in need. In order to guarantee the quality of trainees, there is a growing need to establish a standardized neurology residency program worldwide. Even with deficient resources, interinstitutional cooperation among the individual teaching hospitals can assist in providing adequate exposure to a multitude of neurologic diseases and add to the experience of trainee residents and fellows. If accepted by high-level hospitals, this type of integration will facilitate higher quality neurologic care.^{4,5}

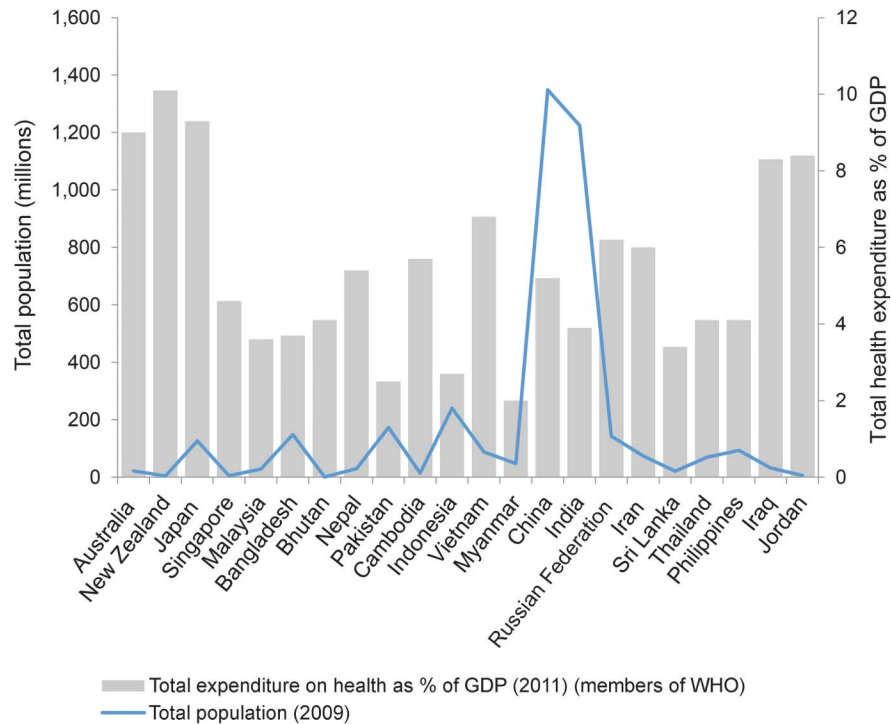
Another important hurdle is the paucity of subspecialized neurologic services. Subspecialized neurologic services provide a base for conducting directed patient-oriented research and training as many neurologic disorders require highly specialized skills.

The lack of adequate training programs and absence of subspecialty fellowship training has resulted in the practice of neurology by those who are untrained in this complex field. Family practice physicians and general medicine physicians with a special interest in neurology

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Figure Comparison of total expenditure on health as a percentage of GDP (2011) and total population (2009) of some countries in the Asia and Oceanian region



¹GDP = gross domestic product.

or those who have passed a board or examination in neurology constitute the majority of those providing neurologic care. Dissemination of appropriate information to such providers and community neurologists through continuing medical education, conferences, seminars, and journals helps maintain best practices.

In addition to infrastructure development and allocation of resources, governments and national and regional neurologic organizations such as Asian and Oceanian Congress of Neurology, Asian and Oceanian Epilepsy Congress, Asia Pacific Stroke Organization, and others should set forth standard curriculum and

Table Neurology training, eligibility, and duration and number of neurologists/million population in some of the developed and developing countries of the Asian and Oceanian region

Country (World Bank income group—developing/developed)	Qualification awarded (name of training)	Eligibility	Duration	Neurologists/million population
Australia and New Zealand (high—developed)	Fellowship of the Royal Australasian College of Physicians, specialist neurology and paediatric neurology (The Royal Australasian College of Physicians, Adult Medicine Division and Paediatric and Child Health Division training)	Initial medical qualification (foundation studies) and ≥1 year postgraduate workplace experience	6 years: 3 years basic training curricula (general multispecialty) and 3 years advanced training curricula (in detail, specialty-specific)	10.1-50
Japan (high—developed)	Board-certified (Board examination for postgraduate training in neurology)	Board certification in internal medicine	6 years: 3 years in neurology training, 2 years of initial general training, and 1 year of internal medicine training	10.1-50
Singapore (high—developing)	Board-certified by Specialists Accreditation Board (SAB) (advanced specialist training program)	3 years of basic training and passing Master of Medicine (M Med) or equivalent higher professional examination	3 years neurology training	1.1-10
Malaysia (upper middle—developing)	Advanced Master of Medicine—Neurology (AMMed Neurology) (residency training program)	Master of Medicine—MMed Medicine Master of Paediatrics MRCP with 18 months of experience in medicine/ paediatrics	3 years neurology training	1.1-10
Russia (lower middle—developed)	Neurology certificate by Russian Academy of Medical Sciences (neurology residency training)	2 years residency	3 years postgraduate program in neurology	>50

Continued

Table Continued

Country (World Bank income group—developing/developed)	Qualification awarded (name of training)	Eligibility	Duration	Neurologists/million population
Philippines (lower middle—developing)	Board-certified (residency training program)	Board certification in internal medicine	3–4 years neurology training	1.1–10
Thailand (lower middle—developing)	Board-certified (residency training program)	1 year rotation in internal medicine program	4 years neurology training	1.1–10
India (lower middle—developing)	DM Neurology (higher specialty postdoctoral course)	3 years duration MD degree (Doctor of Medicine)/DNB (Diplomate of National Board) in general medicine or in pediatric medicine	3 years (Doctorate of Medicine) DM Neurology	0–1
China (lower middle—developing)	Neurology board-certified (neurology residency, National Board of Neurology [license for neurologist specialist])	Doctor of Medicine (MD) degree	3–4 years neurology training	1.1–10
Cambodia (low—developing)	Doctorate in Medicine with specialization (specialist training programs)	Bachelor of Medical Sciences (BMedSc) +2 years internship	3–4 years of specialization	Not available
Pakistan (low—developing)	FCPS Neurology (Neurology Residency Training Programme)—Pakistan College of Physicians and Surgeons	FCPS part I and 2 years of training in internal medicine and FCPS part II	3 years neurology training	0–1

Abbreviation: FCPS = Fellowship of College of Physicians and Surgery.

training guidelines for those undertaking this specialized training.

Factors influencing the formulation of effective and standardized training programs are as follows:

1. Lack of personnel and infrastructure necessary for training and provision of care
2. Absence of a standardized curriculum and program design
3. Lack of standardized teaching and evaluation methods
4. Current training programs not overseen by a program director or coordinator
5. Lack of enforcement of best practice guidelines within training programs and variations in training between urban and rural areas⁵

Discussion. Cooperation among governmental, international, and national neurology organizations can facilitate establishment of a structured format of neurology training within the Asian and Oceanian region, thereby standardizing the quality of neurology trainees worldwide and improving quality of patient care. Simultaneously, the quality of health care infrastructure requires improvement.

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