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Is the 2015 eye care service delivery profile in Southeast Asia closer to universal eye health need!

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Abstract

Purpose The year 2015 status of eye care service profile in Southeast Asia countries was compared with year 2010 data to determine the state of preparedness to achieve the World Health Organization global action plan 2019.

Methods Information was collected from the International Agency for Prevention of Blindness country chairs and from the recent PubMed referenced articles. The data included the following: blindness and low vision prevalence, national eye health policy, eye health expenses, presence of international non-governmental organizations, density of eye health personnel, and the cataract surgical rate and coverage. The last two key parameters were compared with year 2010 data.

Results Ten of 11 country chairs shared the information, and 28 PubMed referenced publications were assessed. The prevalence of blindness was lowest in Bhutan and highest in Timor-Leste. Cataract surgical

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rate was high in India and Sri Lanka. Cataract surgical coverage was high in Thailand and Sri Lanka. Despite increase in number of ophthalmologists in all countries (except Timor-Leste), the ratio of the population was adequate (1:100,000) only in 4 of 10 countries (Bhutan, India, Maldives and Thailand), but this did not benefit much due to unequal urban–rural divide.
Conclusion The midterm assessment suggests that all countries must design the current programs to effectively address both current and emerging causes of blindness. Capacity building and proportionate distribution of human resources for adequate rural reach along with poverty alleviation could be the keys to achieve the universal eye health by 2019.

Keywords Southeast Asia · Eye care delivery · Universal eye health

Introduction

The World Health Organization (WHO) division of the Southeast Asia region consists of 11 countries, namely Bangladesh, Bhutan, DPR Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste. The population of these 11 countries at 1761 million is approximately 26% of world population. Using the published information, the WHO reported the global data on visual impairment 2010 of all six WHO regions [1]. As per this estimate, 4.24% people of world were visually impaired—0.58% blind (visual acuity <3/60) and 3.65% impaired vision (visual acuity <6/18 ≥ 3/60). This amounted to 39.365 million people blind and 246.024 million people with impaired vision (a total of 285.389 people with any kind of visual impairment). The report also stated that 12.049 million blind people and 78.482 million people with vision impairment live in the Southeast Asian region. This amounts to 30.60 and 35.89% of world's blind and impaired vision people, respectively. The World Health Organization (WHO) 2010 data [2] documented many key parameters that form the base line data for implementation of the global action plan (GAP) to universal eye health as stipulated by WHO resolution 66.4 [3].

In this midway analysis between 2010 and 2019, we collected data from 10 of 11 member states of the region and added additional information form the recently published papers. The key data were compared with the 2010 WHO data.

Methods

The data collected from the International Agency for Prevention of Blindness (IAPB) country chairs (10 of 11 countries, with exception of DPR Korea) included information regarding the national health policy, national health expenditure, insurance and out-of-pocket expense for eye health care, the strength of eye health personnel, training and future man power planning and presence of the international non-governmental organization (INGO). In addition, we also accessed the PubMed referenced recent articles using the key words "blindness," "low vision," "vision impairment," "south east Asia" from January 2000 to December 2015. This was confined to reports on adult and pediatric population blindness survey and two principal causes of visual impairment—the cataract and the uncorrected refractive error. Other disease specific data such as trachoma, corneal blindness, glaucoma and diabetic retinopathy were not included in the analysis.

Results

A number of population-based survey publications are available on blindness and visual impairment in the Southeast Asia region [4–31]. While all these studies have estimated the prevalence and causes of blindness and visual impairment, few studies have looked at the eye care service profile in the Southeast Asia region [2]. The current situation analysis of eye care service in the Southeast Asia region is as follows.

Health indices

Life expectancy has increased in all member states. In general, females live longer than males. The life expectancy for males at 73.13 years was highest in Maldives and at 64 was lowest in Myanmar; for the females it was highest in Thailand (79 years) and Maldives (74 years) and lowest in India and Myanmar (68 years). The mortality rate under 5 years age was highest in Timor-Leste (54.6/1000 live births)

followed by India (52.7/1000 live births) and lowest in Sri Lanka (9.6/1000 live births) and Maldives (10/1000 live births).

Blindness and low vision

The blindness prevalence data were not available from Maldives. It was low in Bhutan (0.33%), Nepal (0.35%), Myanmar (0.58%) and Thailand (0.59%). It was around 1% in Indonesia (0.9%), India (1%) and Bangladesh (1.6%) and apparently high in Timor-Leste (4.2% for 40+ age group).

National eye health policy

The Ministry of Health (MoH) in each country is responsible for all health-related policies and planning. The VISION 2020 is operational in all countries. But only five countries in the region have an established national eye health plan. They include Bangladesh—the Bangladesh National Control of the Blind (BNCB); India—the National Program for Control of Blindness (NPCB); Indonesia—Ministry of Health, National Eye Committee; Nepal—Apex Body of eye health; and Thailand—the National Committee of Eye Care services.

Eye health expenses

The expenditure as percentage of national gross domestic product (GDP) for health in general was highest in Maldives (7.3%) and lowest in Myanmar (0.99%); all other member state expenditure was between 4 and 6% of GDP. There was no knowledge of eye care expenses specifically.

Insurance and out-of-pocket expense

Insurance of eye health care is not uniformly distributed. Eye care is solely provided at the government cost in Bhutan and Myanmar; the government of Maldives has insured all people in the country; primary eye care is delivered at no cost to the patients in Nepal at village level; and the government of India offers incentive to non-government health providers for free eye care. However, a major challenge lies in accessing free eye care in nearly all member states. All the same, there is out-of-pocket expense in most instances; at 20%, it is lowest in Thailand and probably higher in other countries.

Integration with general health delivery system

The eye health is not integrated into general health system in all countries of the region. It is mostly integrated into Bhutan and Sri Lanka at the primary level; the government of India and Nepal is experimenting in few areas of the country.

Strength of eye health personnel

Complete data of all cadres of eye health workers were not available in all countries. This was particularly true for eye care nurses since in many instances there was no clear separation between a general and eye care nurse. Compared to year 2010, the number of ophthalmologists has increased in all countries except Timor-Leste. But the distribution in the general population was appreciable (1:100,000) only in few countries—Bhutan, India, Maldives and Thailand. Most ophthalmologists in all countries are located in urban areas only. Additionally, Bhutan and Maldives have their specific terrain difficulties. In general, the availability of auxiliary ophthalmic personnel (AOP) was insufficient.

Cataract surgery rate as surrogate for eye care services

Cataract surgical rate (CSR) at 5050/million people was highest in India and was followed by Sri Lanka (5030/million). But it was below the target in many countries. The cataract surgical coverage (CSC) at 95% was highest in Thailand followed by Sri Lanka (86%) and Nepal (80%).

International non-governmental organizations

Many international non-governmental organizations (INGOs) work in Bangladesh, India, and Nepal followed by Indonesia and Timor-Leste. None of the INGO currently have presence in Maldives, and one INGO, the Himalayan Cataract Project (HCP), works in Bhutan.

The details are listed in Table 1.

Table 1 Comparative statement of eye care service delivery in year 2010 and 2014 in Southeast Asian countries

Country	Services	2010 data*	2014 data**
Bangladesh	Country	Population: 151,616,777	Population. 162,494,971
	Health service		All health services are provided by the government, non-government and private sector
			The non-government sector (NGO sector) is the largest provider in the country
			Still there are several challenges for the rural people to access to quality eye care services due to cost and distance
	National health expenditure	Eye health: US$ 557,142	3.73% of GDP (2013 data) general health
	Insurance versus out-of-pocket expense		There is no universal heath insurance scheme in the country. Out-of-pocket expense is over 90%. About 10% have some form of support from charity and government sector
	Health indices		Life expectancy at birth: male : 70 years, female 71 years
			Mortality rate of children <5 years/1000 live births: 38
			Percentage of persons over 50+ years
	Eye health governance		National Eye Care (NEC)—is a separate Line Director under
			Director General of Heath Services (DGHS) of MoH
			The Bangladesh National Council for the Blind (BNCB) headed by the Health Minister is the supreme authority to approve the national eye care plan
			There is also a national vision 2020 advisory committee headed by the DGHS
	Eye health epidemiology		Blind: 1.6%
			Major visual impairment causes: cataract, URE, cornea, retina
	Cataract surgery as surrogate of eye health	1164/million (2009)	Cataract surgical rate: 1475/million (2014 data)
			Cataract surgical coverage: 32%
	Eye health workforce (public)	Ophthalmologists ($n = 900$);1:168,474	Ophthalmologists: ($n = 1000$) 1:162,494
			Optometrists and technicians: ($n = 1200$) 1:125,000
	Major eye health international NGO		Andheri-Hilfe Bonn, CBM, Fred Hollows, Hart to heart, Helen Keller, Orbis, Sight Savers
Bhutan	Country	Population: 720,246	Population: 782,089
	Health services		Government provides free health services at all levels
	National health expenditure	Eye health: US$ 200,000	3.55% of GDP (2012 data) general health
	Insurance versus out-of-pocket expenses		No general health insurance schemes.
	Health indices		Life expectancy in birth: 68 years
			Mortality rate of children <5 years/1000 live births: 37.3 (2012 data)
			Percentage of persons over 50+ years

Table 1 continued

Country	Services	2010 data*	2014 data**
	Eye health governance		Primary eye care program is the nodal agency for eye care services under the department of Medical Sciences, MoH
	Eye health epidemiology		Blindness: 0.33%
			Major causes are: un-operated cataract—67.6%; posterior segment disorders—42.1%; corneal blindness—1.5%; phthisis bulbi—5.9%
			Major causes of visual impairment: cataract—57.1%;
			uncorrected refractive error—34.1%; posterior segment disorders—14.4%
	Cataract surgery as surrogate of eye health	1450/million (2009)	Cataract surgical rate: 1550/million (2009 survey)
			Cataract surgical coverage: 72.5%
	Eye health workforce (public)	Ophthalmologists ($n = 6$)	Ophthalmologists: ($n = 8$)1:97,761
		1:120,042	Optometrists and technicians: ($n = 62$) 1:12,210
			Ophthalmic nurses: 4
	Major eye health international NGO		Himalayan Cataract Project (HCP)
India	Country	Population: 1,214,182,182	Population: 1,311,052,527
	Health services		All health services are provided by both the government and private sector
			Several challenges in rural health service.
	National health expenditure	Eye health: US$ 58 million	4% of GDP (2013 data)
	Insurance versus out-of-pocket expense		Out-of-pocket expense is 86%. About 10 percent of Indians
			have some form of health insurance mostly formal sector and government employees.
	Health indices		Life expectancy at birth: male 67.3 years; female 69.6 years (2013 data)
			Mortality rate of children <5 years/1000 live births
			Percentage of persons over 50+ years: 16%
	Eye health governance		National Program for Control of Blindness (NPCB)
			State Health Society
	Eye health epidemiology		Blindness: 1%
			Major cause of blindness: cataract, URE, glaucoma, diabetic retinopathy
	Cataract surgery as surrogate of eye health	4550/million (2007)	Cataract surgical rate: 5050/million (2014)
			Cataract surgical coverage: 66%
	Eye health workforce (public)	Ophthalmologists ($n = 15,000$)	Ophthalmologists: ($n = 18,100$) 1:74,433
		1:80,945	Optometrists and technicians: ($n = 49,000$) 1:24,693
			Opticians: ($n = 27,000$) 1:44,81
	Major eye health international NGO		CBM, Help Me See, OEU, Orbis, LCIF, Sight Life, Sight Savers

Table 1 continued

Country	Services	2010 data*	2014 data**
Indonesia	Country	Population: 241,613,126	Population: 257,563,825
	Health services		All health services are provided both by the government and private sector.
	National health expenditure	Eye health: US$ 5 million	3.5% of GDP
	Insurance versus out-of-pocket expense		32.9 versus 67.1%
	Health indices		Life expectancy at birth: 70.2 years, female 70.2 years
			Mortality rate of children <5 years/1000 live births: 41
			Percentage of persons over 50+ years: 8.03%
	Eye health governance		Ministry of Health, National Eye Committee
	Eye health epidemiology		Blindness: 0.6%, RAAB 3.2%
			Major causes of visual impairment: URE, cataract, glaucoma, diabetic retinopathy
	Cataract surgery as surrogate of eye health	500/million	Cataract surgical rate: 1079/million (2014)
		(Target 2800/million)	Cataract surgical coverage: 25.7%
	Eye health workforce (public)	Ophthalmologists ($n = 1641$)	Ophthalmologists: ($n = 1752$); 1:147,011
		1:147,145	Optometrists; opticians: ($n = 689$) 1:370,101
			Ophthalmic nurses: ($n = 11{,}000$) 1:23,181
	Major eye health international NGO		Helen Keler International, Christopher Blinden Mission, Fred Hollows; Lions International
Maldives	Country	Population: 319,738	Population: 341,848
	Health service		Twenty atoll-based hospitals, 2 capital-based hospitals, 165 health centers, 2 tertiary-level hospitals. Centers
	National health expenditure	Eye health: not available	7.3% of GDP (2013 data)
	Insurance versus out-of-pocket expense		All services including eye health are covered under "Aasandha," government social insurance scheme. In addition to medical and surgical care,
			it also offers US$ 65 for spectacles with a 2-year limit
	Health indices		Life expectancy at birth: male : 73.13 years, female 74.77 years
			Mortality rate of children <5 years/1000 live births: 10
			Percentage of persons over 50+ years: 14.3%
	Eye health governance		Integrated into government health care no separate eye health governance system exists
			Eye health services are limited up to regional health facilities
	Eye health epidemiology		No population-based data available on blindness and major causes of visual impairment
	Cataract surgery as surrogate of eye health	700/million (2009)	Cataract surgical rate: 1287/million (2014)
			Cataract Surgical coverage: Not known.

Table 1 continued

Country	Services	2010 data*	2014 data**
	Eye health workforce (public)	Ophthalmologists ($n = 19$) 1:17,195	Ophthalmologists: ($n = 19$) 1:28,487
			Optometrists and technicians: ($n = 10$) 1:34,184
			Ophthalmic nurses: ($n = 4$) 1:85,462
			Opticians: ($n = 6$) 1:56,974
			Administrators: ($n = 4$) 1:101,915
	Major eye health international NGO		No major eye health NGO
Myanmar	Country	Population: 51,735,013	Population: 53,897,154
	Health service		Government provides free health services at all levels
	National health expenditure	Eye health: US$ 8.4 million	0.99% of GDP (2013 data)
	Insurance versus out-of-pocket expense		No general health insurance schemes.
	Health indices		Life expectancy at birth: male : 64 years, female 71 years
			Mortality rate of children <5 years/1000 live births: 48
			Percentage of persons over 50+ years: 14.3%
	Eye health governance		Ministry of Health; National Health Committee
	Eye health epidemiology		Blindness: 0.58%
			Major causes of visual impairment: cataract, URE, glaucoma
	Cataract surgery as a surrogate of eye health	1000/million (Target)	Cataract surgical rate: 2038/million
			Cataract surgical coverage: not known
	Eye health workforce	Ophthalmologists ($n = 250$) 1:206,940	Ophthalmologists: ($n = 328$) 1:164,320
			Optometrists and technicians: ($n = 44$) 1:1,168,636
			Ophthalmic nurses: ($n = 212$) 1:242,547
	Major eye health INGOs		Helen Keler, CBM, Sight for All, Fred Hollows, Himalayan Cataract Project
Nepal	Country	Population: 26,875,910	Population: 28,513,700
	Health services		Free primary health care in at village level
			There are 102 public hospitals, 208 primary health care centers (PHCCs), 1559 health posts (HPs) and 2247 sub-health posts (SHPs)
			Eye health not integrated into health delivery system
			Separate structure for eye health under local NGOs such as Nepal Netra Jyoti Sangh (16 eye hospitals 61 eye care centers)

Table 1 continued

Country	Services	2010 data*	2014 data**
	National health expenditure		6% of GDP (2013 data)
	Insurance out-of-pocket expense		No public insurance system to cover eye health
			Government is piloting for social insurance in general health in some districts
	Health indices		Life expectancy at birth: male : 67 years, female 70 years
			Mortality rate of children <5 years/1000 live births: 33
			Percentage of persons over 50+ years: 14.3%
	Eye health governance		Apex Body for Eye Health at MoH (Only involved in policy matter) and not very active.
	Eye health epidemiology		Blindness: 0.35%
			Major causes of visual impairment: cataract, URE, glaucoma
	Cataract surgery as surrogate of eye health	3500/million (Target)	Cataract surgical rate: 4513/million (2014)
			Cataract surgical coverage: 60–80% in different zones of the country
	Eye health workforce	Ophthalmologists ($n = 130$) 1:206,737	Ophthalmologists: ($n = 201$) 1:141,156
			Optometrists and technicians: ($n = 656$) 1:40,548
			Ophthalmic nurses: ($n = 120$) 1:218,333
			Orthoptist: 6
	Major eye health INGOs		CBM, Help Me See, Seva Foundation, Norwegian Association for Blind and Partially Sighted, Fred Hollows, Himalayan Cataract Foundation, Eye Care Foundation, Lions Club International Foundation, US Aid, Orbis International, Help Age International
Sri Lanka	Country population	20,201,312	20,715,090
	Health services		Ministry of Health and Indigenous Medicine
	National health expenditure	Eye health: US$ 9.1 million	3.24% of GDP (2013)
	Insurance out-of-pocket expense		Free health services including eye care
	Health indices		Life expectancy—76.35 years; males—72.85 years and females—79.99 years (2014 estimate)
			Mortality rate of children under 5 years/1000 live birth; 9.8 in 2015
			Percentage of persons over 50 years; 23.59% (2014)
	Eye health governance		Ministry of Health
	Eye health epidemiology		1.7% blindness age 40 and above
			Major course of blindness is cataract

Table 1 continued

Country	Services	2010 data*	2014 data**
	Cataract surgery as surrogate of eye health	3500/million (Target)	CSR—5030/million population CSC—86%
	Eye health workforce	Ophthalmologists ($n = 65$) 1:310,789	Ophthalmologists—($n = 91$) 1:227,638 Optometrists—($n = 275$) 1:74,490 Opticians—($n = 475$) 1:1:46,021
	Major eye health INGOs		CBM, Germany, Sight savers, Saw others May See
Thailand	Country	Population: 66,692,024	Population: 67,959,359
	Health services		
	National Health Expenditure	Not available	4.5% of GDP (2012 data)
	Insurance versus out-of-pocket expense		79.5 versus 20.5%
	Health indices		Life expectancy at birth: male 71 years; female 79 years (2012 data) Mortality rate of children <5 years/1000 live births: 11.3 Percentage of persons over 50+ years: 28%
	Eye health governance		National Committee of Eye Care service
	Eye health epidemiology		Blindness: 0.59% Major cause of blindness: cataract, glaucoma, AMD and DR
	Cataract surgery as surrogate of eye health	2090/million (2009)	Cataract surgical rate: 2400/million Cataract surgical coverage: 95%
	Eye health workforce	Ophthalmologists ($N = 808$) 1:82,539	Ophthalmologists: ($n = 1320$) 1:51,484 (central: 1:28,000; peripheral 1:70,000) Optometrists and technicians: ($n = 50$) 1:1,342,000 Ophthalmic nurses: ($n = 8000$) 1:8387
	Major eye health international NGO		LCIF
Timor-Leste	Country population	1,057,122	1,184,705
	Health services		Eye health integrated into government health care
	National health expenditure		1.3% of GDP, USD 96.6 per capita (2013)
	Insurance out-of-pocket expense		Free health services including eye health
	Health indices		Life expectancy 65 years for Male and 69 for female, U5 mortality 64/1000 live birth
	Eye health governance		Integrated into government healthcare system
	Eye health epidemiology		Blindness: 4.2% in age 40+ population

Table 1 continued

Country	Services	2010 data*	2014 data**
	Cataract surgery as surrogate of eye health	379/million (2009)	CSR 720 per million in 2014
	Eye health workforce	Ophthalmologists ($n = 3$) 1:352,374	Ophthalmologist ($n = 3$) 1:394,902
	Major eye health INGOs		Fred Hollows and Royal Australasian College of Surgeon

Source: WHO Situational analysis* and Response of IAPB Country Chairs**; population data was obtained from Worldometer (www.worldometers.info)

Discussion

In May 2013, the 66th World Health Assembly (WHA) endorsed resolution WHA 66.4—the "universal eye health: a global action plan (GAP) 2014–2019" [3]. The WHO set a global target of reduction in prevalence of avoidable visual impairment by 25% by 2019 from the baseline of 2010. The GAP 2014–2019 is intended to serve as a road map to consolidate joint efforts aimed at working toward universal eye health in the world. The WHO collected the year 2010 base line data. The Southeast Asian member states exchanged each country data annually, and the information collected here (Table 1) is the current data in key areas. This helps in the region's preparedness for implementation of universal eye health by year 2019.

Available blindness data are at best patchy in a few countries. While it is possible that blindness will reduce in all countries in the region, it is difficult to forecast the actual number. The high burden of blindness in the Southeast Asia region continues with below target cataract surgery in many countries. Two main causes are the un-operated cataract and uncorrected refractive error, though there is a need to shift the exclusive focus from cataract to other emerging causes of blindness, such as glaucoma and diabetic retinopathy in countries where a good cataract surgical rate and good cataract surgical coverage are already achieved [32]. An effective control of the chronic diseases such as diabetic retinopathy and glaucoma requires a different planning and implementation because both detection and treatment of these diseases are a lot more different than cataract and refractive error-related blindness and visual impairment. This calls for greater emphasis on training and developing the required skills in mid-level ophthalmic personnel and the ophthalmologists in the entire region [33, 34].

The utilization of services in rural population is inadequate in all countries [35, 36]. The healthcare personnel are also mostly urban centric. What is the remedy? One of the ways is the mass community service that is practiced in certain countries in the region, particularly, in India and a few neighboring countries. But this is only a temporary solution. A tier model of eye care service, adequate for the area, affordable and accessible to people is increasingly tried with a greater degree of success [37, 38].

In general, health and disease are linked to poverty; eye disease is no exception [39]. While the various

governments will continue to improve the economics of the country, the current eye care delivery model in this region has to be unique that could deliver quality eye care in most equitable manner [40]. The current preparedness in most regions is inadequate and needs a greater thrust to achieve the WHO stated goal by the year 2019.

Conclusion

Provision of comprehensive eye care thorough different models of fixed facility at the district/provincial level coupled with adequate training, both in quantity and in quality, of people possibly help bridge the gap and achieve universal health coverage. Further, increasing financial allocation and periodic monitoring of disease burden are critical for the success of eye care programs across the region.

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Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interest.

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