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Prevalence and causes of vision loss in East Asia in 2015: magnitude, temporal trends and projections

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Prevalence and Causes of Vision Loss in East Asia: 2015: Magnitude, Temporal Trends, and Projections

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Jost B. Jonas: Consultant for Mundipharma Co. (Cambridge, UK); Patent holder with Biocompatibles UK Ltd. (Farnham, Surrey, UK) (Title: Treatment of eye diseases using encapsulated cells encoding and secreting neuroprotective factor and / or anti-angiogenic factor; Patent number: 20120263794), and Patent application with University of Heidelberg (Heidelberg, Germany) (Title: Agents for use in the therapeutic or prophylactic treatment of myopia or hyperopia; Europäische Patentanmeldung 15 000 771.4

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Contributors Statement: RRAB, MVC, AD, AS, NT, and TB prepared the vision impairment survey data. SRF and RRAB analyzed the data. C-YC and TYW wrote the first draft of the report. All authors contributed to the study design, analysis, and writing of the report. RRAB oversaw the research.

ABSTRACT

Background

To determine the prevalence and causes of blindness and vision impairment in East Asia in 2015 and to forecast the trend to 2020.

Methods

Through a systematic literature review and meta-analysis, we estimated the prevalence of blindness, moderate and severe vision impairment (MSVI), mild vision impairment (mild VI) and presbyopia for 1990, 2010, 2015, and 2020. A total of 41 population-based studies were included in the analysis.

Results

In 2015, age-standardised prevalence of blindness, MSVI and mild VI was 0.37%, 3.06%, and 2.65%, respectively, in East Asia. East Asia was responsible for 17.2% (6.19 million), 24.4% (52.88 million) and 24.3% (265.34 million) of the world's population with blindness, MSVI, and near vision impairment, respectively. Cataract (43.6%) was the leading cause of blindness, followed by uncorrected refractive error (12.9%), glaucoma (7.1%), age-related macular degeneration (5.3%), corneal diseases(4.3%), trachoma (1.8%) and diabetic retinopathy (0.5%). The burden of uncorrected refractive error, glaucoma and diabetic retinopathy are estimated to increase in the future. The leading cause for MSVI was uncorrected refractive error (47.1%), followed by cataract (32.5%), age-related macular degeneration (3.4%), glaucoma (1.6%), corneal disease (1.5%), trachoma (1.3%) and diabetic retinopathy (0.6%) in 2015. Generally, compared to men, women had a higher prevalence of blindness, MSVI and mild VI for all ages.

Conclusions

Cataract and uncorrected refractive error remain the top two causes for blindness and MSVI in East Asia. Addressing the public health care barriers for these two main causes can help eliminate almost 57% of all blindness cases in this region. Additionally, the burden for glaucoma and diabetic retinopathy for vision impairment is on the rise. These findings inform where resources should be directed to reduce blindness and MSVI in East Asia..

INTRODUCTION

Asia is the most populated continent, and especially East Asia, which was reported to be home to 1.61 billion people in 2015. The population of East Asia is aging faster than any other region in history[1]. From 2015 onwards it is estimated that East Asia's elderly population (aged 65 years or older) will grow by 22% every 5 years for the next 20 years[1]. With a rapidly increasing elderly population in this region, we expect to see an increase in major age-related eye diseases and vision impairment. Vision loss is among the top three most common impairments in terms of years lived with disability (YLD) [2], and has been found to have a clinically meaningful impact on overall mobility and independence in populations in the region [3]. Furthermore, vision impairment decreases quality of life among affected people, and thus poses a public health concern for East Asia.

Several studies have investigated the prevalence of vision impairment in East Asian countries [4-6], but there are few reports summarising epidemiological data and establishing specific causes for vision loss across the region. Notably, the Vision Loss Expert Group of the Global Burden of Disease Study was the first to summarize causes of vision loss from 1990-2010 in East Asia [7]. We demonstrated that moderate to severe vision impairment (MSVI) in 2010 affected 33.3 million and blindness was 5.2 million people [7]. We also reported that the major cause for blindness and MSVI was cataract and uncorrected refractive error, respectively [7]. With an increasing elderly population and changing lifestyles and socio-economic conditions in East Asia, an updated report on vision loss is needed to improve allocation of healthcare resources for the coming years. The current report aims to update these epidemiological data by analysing the prevalence and causes of vision loss in East Asia for 2015, providing projections for 2020, and comparing these findings globally.

METHODS

The methodology used for the preparation of prevalence estimates for vision impairment and blindness, which includes a PRISMA checklist, PRISMA flowsheet and a detailed account of the statistical models used, have been published in full elsewhere.[8-10] A brief overview is given as follows. Using data from the Global Vision Database[11], we estimated 1990-2015 trends in vision impairment prevalence and their uncertainties, by age and gender, for 188 countries in the 21 Global Burden of Disease regions. For this report specifically looking at East Asia, we included data from a total of 44 studies from mainland China (n = 40 studies), Hong Kong (n = 1 study), and Taiwan (n = 3 studies). South Korea and Japan were not included in this report, as data from these two countries were included in the report addressing the high-income Asia Pacific region[12].

Eligible studies were identified through a systematic review, including reports published between 1980 and 2014 and unpublished data identified by members of the Vision Loss Expert Group convened for the 2010 Global Burden of Disease Study. Using the same search terms as a previously-published systematic review [13], we extended the review to include more recently published studies; up to July 2014.

Using definitions and an analytical framework similar to our earlier report [14], we estimated the prevalence of two of the core categories of vision impairment: *1*) blindness (presenting visual acuity worse than 3/60 in the better eye), and *2*) a combined moderate and severe vision impairment grouping called MSVI (presenting visual acuity in the better eye of worse than 6/18 to 3/60 inclusive).

Following the strategy in Stevens et al [14], we standardised all prevalence data to the definitions of vision impairment used for this report. Four regressions were used to convert two commonly used definitions of blindness (visual acuity <6/60 and visual acuity ≤6/60) to our definition of blindness; and two commonly reported definitions of vision impairment (visual acuity <6/18 and visual acuity <6/12) to our definition of MSVI.

We fitted two hierarchical Bayesian logistic regressions (one for the prevalence of blindness and one for MSVI) to estimate vision impairment prevalence over time, by age group, gender and country. Using fully Bayesian statistical inference[15], our posterior estimates of vision impairment were able to flexibly borrow strength such that country-specific estimates were informed by study data from the same country, and by study data from other countries in the same region or the same year. We modelled hierarchical linear trends over time to estimate region-specific trends in prevalence of vision impairment. Prevalence estimates are reported as posterior means along with 80% posterior uncertainty intervals (UI).

In order to estimate the prevalence of near vision impairment due to uncorrected presbyopia (functional presbyopia), we included studies where presbyopia was defined as presenting near vision worse than N6 or N8 at 40 cm regardless of distance refractive status. For broad estimates of vision impairment including both distance and near presenting impairment, we only included data from those people whose best-corrected visual acuity was 6/12 (20/40) or better, so as to avoid double counting those with both distance and near vision impairment associated with non-refractive causes. We developed a similar model to the main model used for blindness and MSVI.

We applied our model to forecast prevalence of blindness and MSVI for 2020 into the future. Our model relies on health status and education as covariates. Since it is impossible to predict how these will evolve decades into the future, we extrapolated these covariates to the year 2020 and then held them constant to 2050. We used the United Nations Population Division's (UNPOP) forecasts to derive crude numbers and age-standardized prevalence[16].

Using Bayesian hierarchical logistic regression models, we estimated the proportions of overall vision impairment attributable to uncorrected refractive error, cataract, glaucoma, age-related macular degeneration (AMD), diabetic retinopathy (DR), corneal diseases,

trachoma, uncorrected refractive error, and other causes in 1990–2015 by geographical region and year[10].

RESULTS

A total of 44 studies met the inclusion criteria for the region of East Asia (China, Taiwan, Democratic People's Republic of Korea) and was included for analysis. The majority of studies (30/44) included only adults, while 6 involved the entire age range. Seventeen were conducted in both rural and urban regions while 13 were conducted in urban areas and 14 in rural areas.

In 2015 the age-standardized prevalence of blindness (all ages) was 0.37% (80% UI 0.12 - 0.68%) in East Asia, while the prevalence of MSVI was 3.06% (80% UI 1.35 - 5.16%) and the prevalence of mild VI was 2.65% (80% UI 0.92 - 4.91%) (**Table 1**). The age-standardised prevalence of presbyopia was 32.91% (80% UI 18.72 - 48.47%) (**Table 1**).

A comparison between the world and East Asia for the age-standardized prevalence of vision loss by gender and age group for 2015 can be found in **Table 2**. In the group aged 50 years and older in East Asia, both genders demonstrated a slightly higher prevalence of MSVI and mild VI, compared to the world population. This trend was also observed for all ages. On the contrary, the global prevalence of blindness for all ages was higher than the prevalence in East Asia for both genders. In general, compared to males, females demonstrated a higher prevalence of blindness, MSVI and mild VI in all ages **(Table 1)**, the group aged 50 years or older (**Table 2**) and across different countries in East Asia (**Figures 1 and 2**).

In 2015 the total number of people blind was estimated at 6.19 million in East Asia (**Table 3**), and China alone had 6.02 million blind people. The total number of blind

individuals residing in East Asia was projected to increase by 8.2% to 6.70 million in 2020. The number of people with MSVI and mild VI was 52.88 million and 46.42 million, respectively, in 2015. The number of individuals for MSVI, mild VI, was projected to increase by 10.6% and 9.9%, respectively, in 2020. There were 265.34 million people with presbyopia and the number was projected to increase to 289.84 million by 2020.

Cataract has been the leading cause of blindness in East Asia since 1990, accounting for more than 42% of blindness globally, and was estimated to continue being the leading cause in 2020 (**Table 4**). In 2015 the second largest cause of blindness was uncorrected refractive error (12.90%, 80% UI 11.15 - 14.61%), followed by glaucoma (7.06%, 80% UI 2.79 - 12.53%), AMD (5.33%, 80% UI 1.34 - 10.95%), corneal disease (4.26%, 80% UI 0.71 - 9.41%), trachoma (1.81%, 80% UI 1.25-2.36%), and lastly DR (0.51%, 80% UI 0.09 - 1.08%). This trend was projected to remain the same for 2020 except that trachoma will have a much lower impact on total blindness compared to other causes. The percentage of blindness due to DR globally in 2015 (1.06%) was more than double, compared to East Asia (0.51%). Conversely, the percentage of blindness due to cataract (43.58%) and trachoma (1.81%) in East Asia in 2015 was much higher than the global prevalence of these diseases in 2015. Notably, the percentage of blindness owing to uncorrected refractive error was lower in East Asia (12.90%), compared to the world (20.28%).

The percentage of total MSVI by cause for all ages is presented in **Table 5**. The leading cause for MSVI globally and for East Asia has been uncorrected refractive error since 1990, and was projected to continue being the leading cause for 2020. Interestingly, the prevalence of uncorrected refractive error for East Asia was lower than the prevalence globally throughout these years. Cataract was the second most common cause of MSVI accounting for 32.54% (80% UI 24.96-40.48%) of total MSVI in 2015. Conversely to uncorrected refractive error, the prevalence of cataract in East Asia was higher than the global prevalence for all years. The third most common cause of MSVI in 2015 was AMD,

followed by glaucoma, corneal disease, trachoma, and lastly DR. The specific cause rankings for MSVI for 2020 were projected to remain fairly constant, except for a slight decrease in the percentage of MSVI due to trachoma (0.14%, 80% UI 0.00-0.64). Generally for causes of MSVI in East Asia, there has been an increase in the percentages prevalence for uncorrected refractive error, cataract, glaucoma, and DR from 1990 to 2015, whereas there has been a decrease for corneal disease and trachoma.

DISCUSSION

In 2010, the Global Burden of Disease Study group estimated the prevalence and major causes of blindness and MSVI for different global regions including East Asia[7]. As the East Asian population rapidly ages, we expected an increase in number of people with blindness and MSVI in this region in the next decade. This report provided an updated meta-analysis of the prevalence and major causes of blindness and MSVI for 2015 in East Asia and projected these findings to 2020 using data from 41 studies conducted in this region.

East Asia alone accounted for 17.2%, 24.4%, and 24.2% of the world's blind, MSVI, and near vision impaired populations, respectively (**Table 3**). Additionally, the age standardized prevalence of MSVI and mild VI was higher in East Asia compared to the global prevalence for all ages. The most common causes of blindness, cataract and uncorrected refractive error, have been increasing over the years as the top causes, and together accounted for almost 57% and 80% of all blindness and MSVI cases, respectively in the region. This reflects the dire need for increased awareness of avoidable MSVI and blindness. For this region, simply providing suitable custom or ready-made glasses (for presbyopia) is a non-surgical approach that can greatly reduce the number of people with MSVI and blindness [17-19]. Optometry is a relatively young profession in China with the number of optometrists well below the manpower required to provide refractive care across the nation. While this

situation is improving, it will take many years before the graduate numbers meet the demand, so additional measures or strategies are required. On the other hand, in addition to making cataract surgery more accessible and affordable in the region [20], the benefit and safety of cataract surgery needs to be communicated more effectively to the population [21]. Therefore, health care efforts should be focused on vision screenings and patient education to increase cataract surgery uptake and reduce the burden of vision loss in East Asia.

After refractive error and cataract, glaucoma was the next major cause for blindness in East Asia and was also projected to increase. The number of glaucoma cases in Asia was projected to increase from 39 million in 2013 to 111.8 million in 2040 and Asia has been accounted for the largest number of cases worldwide [22]. This is not surprising given that East Asia has a population size of 1.61 billion and has been ageing rapidly. In addition, studies showed that there was a higher risk for primary angle-closure glaucoma in East Asians and a higher risk for primary open-angle glaucoma for people living in urban areas [22, 23]. As glaucoma continues as a major threat to blindness in this region and is expected to worsen as China moves towards urbanization, public health strategies should aim to increase efforts for improvements in both glaucoma screening models and better access to eye care service to reduce blindness due to glaucoma.

Unlike AMD, DR prevalence has been steadily increasing from 1990 to 2015 as an increasing cause of blindness, but it is still notably lower than the global prevalence. A recent review on DR also noted a similar trend where the prevalence of DR in Asian countries was lower than western countries[24] and Africa[25]. This could be due to a shorter life expectancy of diabetics in East Asia[25], especially in rural parts of China due to limited access to medical care[26]. In contrast, the decreased in blindness due to AMD may be due to increased clinical therapies for choroidal neovascularization through intravitreal injections of anti-vascular endothelial growth factor [27, 28]. Public health care efforts should therefore

try to focus on promoting the importance of both eye screenings in diabetic people and early detection and treatment of vision-threatening DR.

In East Asia the prevalence of trachoma as a cause for blindness and MSVI has significantly decreased throughout the study period. This is partly due to WHO and International Agency for the Prevention of Blindness (IAPB) as they implemented the Global Elimination of Trachoma by 2020 by using the SAFE program (surgery, antibiotic mass treatment, facial cleanliness and environmental improvement strategy)[29]. Additionally, long-running trachoma control policies such as the implementation of the Chinese National programme and National Blindness Prevention and Treatment program was instituted by the central government to eliminate trachoma by the end of 2015[29]. Therefore, active trachoma is no longer a major threat to East Asia, but remains a cause for blindness and efforts should be made to decrease the threat in rural areas.

There are some limitations to our studies. First, data from Rapid Assessment of Avoidable Blindness (RAAB) surveys were included in this meta-analysis, but these surveys only contributed data to presenting visual acuity and in some cases best-corrected visual acuity data was usually measured through a pin hole. Consequently these studies were only statistically analysed for cataract and uncorrected refractive error as causes for vision loss. Second, a significant percentage of vision loss causes were only categorized under “other causes” accounting for about 25% of blindness and 12% of MSVI in 2015. Third, studies used different disease definitions, especially for glaucoma [30]. Fourth, participants with vision impairment may have multiple ocular diseases contributing to their vision loss which make it difficult to decipher the disease with the greatest impact. Moreover, there were few population-based studies on near vision impairment as most studies focused on the causes of distance vision impairment. Lastly, the projections for 2020 should be taken with caution as these projections assumed that access to healthcare and literacy remained unchanged after 2015.

In conclusion, blindness and vision impairment remain a significant public health concern in East Asia. While there is a decreasing trend for the prevalence of trachoma and AMD, the burden of uncorrected refractive error, cataracts, glaucoma and DR continues to rise. Identifying the barriers to eliminate uncorrected refractive error and cataract as the top two causes for vision loss should become priority as these two causes can be avoided and resolved. Furthermore, routine DR screening should be implemented and better glaucoma screening models should be developed as these two diseases are forecasted to become the next major causes for vision loss in East Asia.

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Table 1. Crude and age-standardised prevalence (%) of blindness and moderate and severe vision impairment, mild vision impairment and near vision impairment in 2015 in East Asia

	BLINDNESS	MSVI	MILD VI	NEAR VI*
CRUDE PREVALENCE				
MALES	0.37 (0.13-0.69)	3.32 (1.48-5.59)	2.99 (1.02-5.59)	-
FEMALES	0.49 (0.16-0.92)	4.09 (1.77-6.95)	3.50 (1.21-6.52)	-
ALL	0.43 (0.14-0.80)	3.69 (1.62-6.25)	3.24 (1.11-6.04)	34.11 (19.49-50.10)
AGE-STANDARDIZED PREVALENCE				
MALE	0.35 (0.12 - 0.64)	2.90 (1.31 - 4.86)	2.56 (0.89 - 4.73)	-
FEMALES	0.39 (0.13 - 0.73)	3.20 (1.39 - 5.45)	2.74 (0.95 - 5.10)	-
ALL	0.37 (0.12 - 0.68)	3.06 (1.35 - 5.16)	2.65 (0.92 - 4.91)	32.91 (18.72 - 48.47)

MSVI, moderate and severe vision impairment; VI, vision impairment; Near VI, near vision impairment due to uncorrected presbyopia

Data presented are for all ages. 80% uncertainty intervals are given in brackets

*A gender breakdown for near vision impairment is not presented due to data sparsity

Table 2. Age-standardised prevalence of blindness, moderate and severe vision impairment, and mild vision impairment, by sex and region comparing adults 50 years and older with all ages for 2015 in East Asia and World

	MEN			WOMEN		
REGION/AGE	**Blindness**	**MSVI**	**Mild VI**	**Blind**	**MSVI**	**Mild VI**
50+						
EAST ASIA	1.43 (0.49 - 2.62)	10.98 (5.12 - 18.19)	9.18 (3.44 - 16.56)	1.61 (0.54 - 3.00)	12.22 (5.46 - 20.48)	9.85 (3.69 - 17.83)
WORLD	1.82 (0.67 - 3.28)	10.12 (4.85 - 16.45)	8.33 (3.10 - 15.02)	1.91 (0.68 - 3.49)	10.79 (5.00 - 17.74)	8.77 (3.23 - 15.84)
ALL AGES						
EAST ASIA	0.35 (0.12 - 0.64)	2.90 (1.31 - 4.86)	2.56 (0.89 - 4.73)	0.39 (0.13 - 0.73)	3.20 (1.39 - 5.45)	2.74 (0.95 - 5.10)
WORLD	0.46 (0.17 - 0.84)	2.79 (1.29 - 4.61)	2.46 (0.84 - 4.55)	0.49 (0.17 - 0.90)	2.99 (1.33 - 4.99)	2.60 (0.88 - 4.85)

MSVI, moderate and severe vision impairment; VI, vision impairment

80% uncertainty intervals of the prevalence estimates are given in brackets.

Table 3. Estimated number of people (millions) affected by blindness and moderate and severe vision impairment, mild vision impairment, and near vision impairment in East Asia in 2015 and projections to 2020.

	Blind		MSVI		Mild VI		Near VI*	
Region	**2015**	**2020**	**2015**	**2020**	**2015**	**2020**	**2015**	**2020**
East Asia	6.19 (2.07 - 11.46)	6.70 (2.18 - 12.50)	52.88 (23.18 - 89.57)	58.48 (24.24 - 100.74)	46.42 (15.96 - 86.58)	51.02 (16.89 - 95.95)	265.34 (154.46 - 383.89)	289.84 (169.73 - 417.83)
World	36.02 (12.86 - 65.44)	38.50 (13.18 - 70.95)	216.60 (98.51 - 359.1)	237.08 (101.50 - 399.02)	188.54 (64.46 - 350.19)	205.73 (67.30 -385.11)	1094.75 (581.13 - 1686.54)	1225.59 (653.43 - 1884.22)

*Projections for near VI beyond 2020 are not presented due to data sparsity

MSVI, moderate and severe vision impairment; VI, vision impairment

80% uncertainty intervals of the prevalence estimates are given in brackets.

Table 4. Proportion of blindness by cause for all ages

Region	Uncorrected Refractive Error	Cataract	Glaucoma	Age-related macular degeneration	Diabetic retinopathy	Corneal Disease	Trachoma	Other
1990								
East Asia	12.76 (10.97 - 14.50)	42.59 (35.35 - 49.66)	6.92 (2.70 - 12.44)	7.04 (1.78 - 14.69)	0.38 (0.08 - 0.80)	5.81 (1.13 - 12.38)	7.21 (6.82 - 7.61)	17.29 (5.98 - 31.44)
World	19.58 (17.29-21.72)	36.67 (30.11-43.22)	8.66 (3.25 - 15.72)	7.93 (2.32-15.54)	0.85(0.15-1.83)	4.75(0.80-10.47)	2.78(2.66-2.90)	18.78 (7.12-32.87)
2010								
East Asia	12.88 (11.12 - 14.59)	43.25 (33.90 - 52.36)	6.97 (2.89 - 12.24)	5.78 (1.54 - 11.73)	0.48 (0.09 - 1.01)	4.41 (0.83 - 9.54)	3.48 (2.97 - 4.00)	22.74 (7.83 - 41.42)
World	20.23 (18.16 - 22.20)	35.67 (27.74 - 43.66)	8.48 (3.17 - 15.38)	6.28 (1.68 - 12.64)	0.99 (0.16 - 2.19)	3.37 (0.58 - 7.39)	1.54 (1.38 - 1.71)	23.43 (8.98 - 40.83)
2015								
East Asia	12.90 (11.15 - 14.61)	43.58 (33.01 - 53.93)	7.06 (2.79 - 12.53)	5.33 (1.34 - 10.95)	0.51 (0.09 - 1.08)	4.26 (0.71 - 9.41)	1.81 (1.25 - 2.36)	24.55 (8.46 - 44.70)
World	20.28 (18.23 - 22.24)	35.15 (26.40 - 44.03)	8.49 (2.99 - 15.66)	5.93 (1.46 - 12.18)	1.06 (0.15 - 2.38)	3.21 (0.50 - 7.19)	0.97 (0.80 - 1.15)	24.92 (9.58 - 43.36)
2020								
East Asia	12.93 (11.18 - 14.64)	43.50 (31.54 - 55.34)	7.11 (2.61 - 13.00)	5.11 (1.17 - 10.57)	0.57 (0.08 - 1.22)	4.20 (0.61 - 9.52)	0.22 (0.00 - 0.82)	26.35 (9.05 - 48.00)
World	20.58 (18.52 - 22.54)	34.73 (25.04 - 44.63)	8.43 (2.75 - 15.96)	5.57 (1.23 - 11.72)	1.20 (0.16 - 2.75)	3.09 (0.42 - 7.09)	0.40 (0.30 - 0.58)	25.99 (9.96 - 45.27)

Data shown are in percentage, %

80% uncertainty intervals of the prevalence estimates are given in brackets.

Table 5. Proportion of moderate to severe vision impairment by cause for all ages

Region	Uncorrected Refractive Error	Cataract	Glaucoma	Age-related macular degeneration	Diabetic retinopathy	Corneal Disease	Trachoma	Others
1990								
East Asia	45.83 (40.95 - 49.77)	32.00 (26.49 - 37.46)	1.49 (0.55 - 2.68)	4.53 (1.04 - 9.57)	0.41 (0.09 - 0.84)	2.16 (0.36 - 4.65)	5.29 (4.97 - 5.62)	8.29 (2.46 - 16.35)
World	50.80 (46.12 - 54.74)	26.62 (21.53 - 31.78)	2.14 (0.69 - 4.11)	5.97 (1.63 - 11.87)	1.03 (0.20 - 2.22)	1.75 (0.25 - 3.81)	1.99 (1.88 - 2.09)	9.71 (3.03 - 18.50)
2010								
East Asia	46.90 (43.17 - 50.01)	32.25 (25.60 - 39.20)	1.52 (0.58 - 2.75)	3.65 (0.92 - 7.60)	0.53 (0.11 - 1.07)	1.58 (0.28 - 3.35)	2.58 (2.16 - 3.01)	10.98 (3.25 - 21.69)
World	52.12 (48.44 - 55.23)	25.55 (19.80 - 31.54)	2.04 (0.66 - 3.93)	4.65 (1.21 - 9.53)	1.21 (0.21 - 2.68)	1.19 (0.19 - 2.55)	1.07 (0.93 - 1.21)	12.17 (3.87 - 23.03)
2015								
East Asia	47.08 (43.32 - 50.19)	32.54 (24.96 - 40.48)	1.56 (0.57 - 2.90)	3.39 (0.81 - 7.11)	0.57 (0.10 - 1.18)	1.54 (0.25 - 3.34)	1.33 (0.87 - 1.80)	11.99 (3.55 - 23.66)
World	52.34 (48.66 - 55.45)	25.15 (18.83 - 31.76)	2.05 (0.62 - 4.03)	4.38 (1.05 - 9.15)	1.30 (0.20 - 2.93)	1.14 (0.17 - 2.48)	0.64 (0.50 - 0.79)	13.00 (4.14 - 24.57)
2020								

East Asia	47.26 (43.41 - 50.39)	32.61 (23.96 - 41.83)	1.60 (0.53 - 3.07)	3.29 (0.72 - 7.02)	0.65 (0.10 - 1.34)	1.54 (0.21 - 3.39)	0.14 (0.00 - 0.64)	12.92 (3.81 - 25.55)
World	52.61 (48.86 - 55.76)	24.75 (17.77 - 32.12)	2.05 (0.57 - 4.15)	4.16 (0.89 - 8.94)	1.49 (0.20 - 3.43)	1.10 (0.14 - 2.45)	0.22 (0.16 - 0.37)	13.61 (4.34 - 25.73)

Data shown are in percentage, %

80% uncertainty intervals of the prevalence estimates are given in brackets.

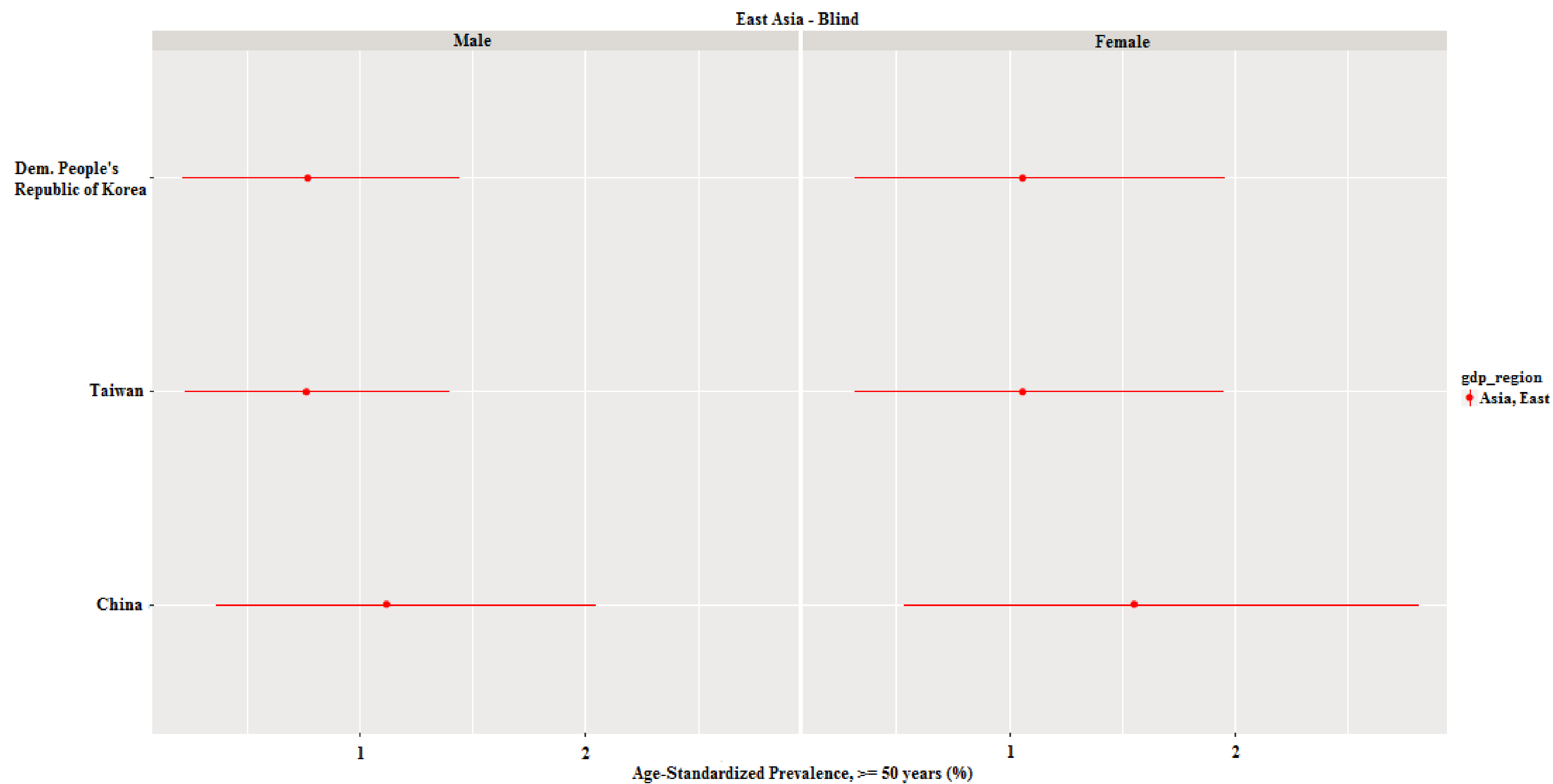

Figure 1. Ladder plot showing the age-standardised prevalence of blindness for males and females aged 50+ years in 2015.

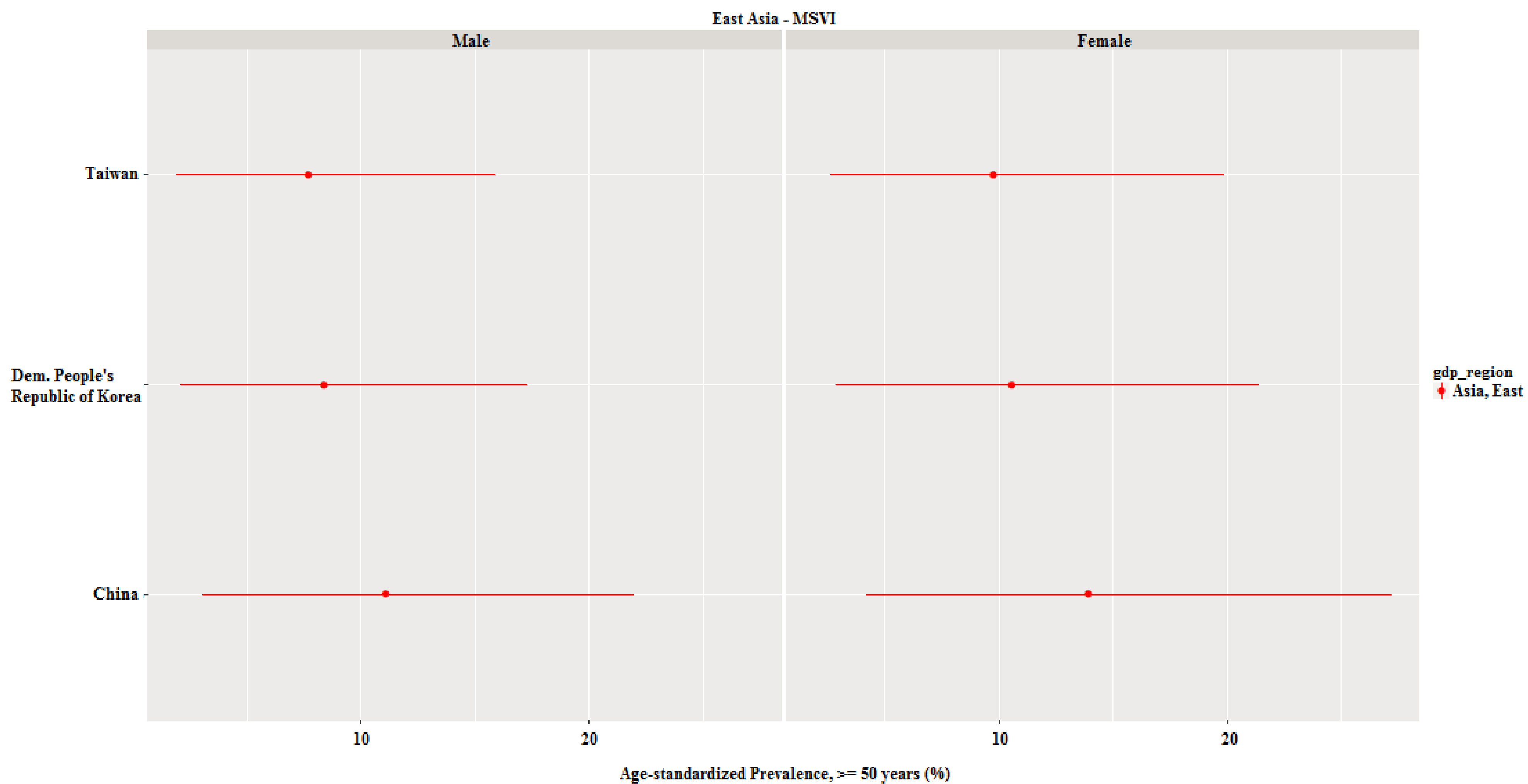

Figure 2. Ladder plot showing the age-standardised prevalence of moderate/severe vision impairment for males and females aged 50 years or older in 2015.