• Investigation •

Rapid assessment of avoidable blindness in Yueqing, an economically developed area in eastern China

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Abstract

• **AIM:** To evaluate the prevalence and the causes of blindness, severe visual impairment (SVI), and visual impairment (VI) and to investigate the frequency of cataract surgery in people aged ≥50y in Yueqing, Zhejiang Province, China.

• **METHODS:** A population-based, cross-sectional study was performed using the Rapid Assessment of Avoidable Blindness technique. Eight-seven clusters, each consisting of 50 people aged ≥50y, were selected by probability-proportionate-to-size sampling. Three outreach teams conducted door-to-door visits. Visual acuity (VA) was measured using a tumbling E chart. Lens status and causes of VI were assessed by ophthalmologists for individuals with a VA of <6/12 in either eye. A standardized questionnaire was used to collect information about cataract surgeries.

• **RESULTS:** Of 4350 eligible individuals, 4120 were examined with a 94.7% response rate. Age- and gender-adjusted prevalence of blindness, SVI, and VI were 0.5% (95%CI, 0.3%–0.7%), 0.7% (95%CI, 0.4%–1.0%), and 4.8% (95%CI, 4.2%–5.5%), respectively. Age was associated with an increased prevalence of VI, and the most common cause of VI was untreated cataracts, with the main barriers to cataract surgery being a lack of knowledge or awareness about cataracts. Of the 415 eyes operated on for cataracts, 68 (16.4%) eyes had a poor outcomes (VA<6/60) and 303 (73.0%) had a good outcomes (VA>6/18).

• **CONCLUSION:** Prevalence rates of blindness, SVI, and VI in Yueqing are lower than other reported Chinese population-based studies. Cataracts remain the most common cause of blindness and VI.

• **KEYWORDS:** visual impairment; cataract surgery; rapid assessment of avoidable blindness; prevalence of blindness

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INTRODUCTION

In 2020, an estimated 43.3 million people were blind, with the majority being female, and 295 million had moderate to severe vision impairment (SVI). While the age-adjusted prevalence of blindness has decreased by 28.5% between 1990 and 2020, the overall number of individuals with vision impairment (VI) has significantly increased due to population growth and aging. By 2050, the number of people affected by blindness and VI is expected to rise sharply, presenting major challenges in addressing global vision loss[1]. The leading global causes of blindness in 2020 were cataract, glaucoma, undercorrected refractive error, age-related macular degeneration (AMD), and diabetic retinopathy, while the main causes of moderate and severe vision impairment (MSVI) were undercorrected refractive error and cataract[2].

It was estimated that China, with a population of over 1.4 billion, would have an increased burden of age-standardized vision loss[3]. Cataract surgery is the most prevalent surgical procedure of all medical specialties and is performed over 28 million times around the world every year. Globally, there are nearly 60 000 cataract procedures every day. Based on the data report from the Royal College of Ophthalmologists in 2022, with an aging population and increasing cataract prevalence, it is estimated there will have been a 50% rise in cataract procedures between 2015–2035.

The prevalence and causes of blindness and VI in the Chinese population have been reported in several previous surveys. A previous study showed that the pooled prevalence of MSVI is 10.9% and blindness is 2.2% using presenting visual acuity (PVA) among older Chinese population[4]. The prevalence of

low vision and blindness is 10.3% and 1.66% in China[5]. The pooled prevalence of MSVI is 10.9%[6].

The Rapid Assessment of Avoidable Blindness (RAAB) survey technique was developed to be an important tool for the evaluation of VI and eye care services among people aged ≥50y in different regions[7]. Since the RAAB was first performed in Kenya in 2005[8], it has been performed in all continents, in 85 countries and at least 385 times, including Philippines[9], Indonesia[10], China[11-14], India[15], and Tanzania[16]. These results provided a useful reference for estimating the global burden of blindness and low vision.

Zhejiang Province is located on the southeast coast of China, bordering the East China Sea in the east. By the end of 2017, the population of this province reached 56.57 million, with 32% living in rural areas, 19.09% aged ≥60y, and a life expectancy of 78y. The per capita gross domestic product was $13 634 and the per capita disposable annual income of residents was $6227 in 2017. Yueqing County is located in the southeast region of Zhejiang Province, bordering Yueqing Bay in the east and the Oujiang River in the south. Yueqing has a similar topography, demographic, urban-rural distribution, and socioeconomic status as the general population in Zhejiang. Therefore, the population of Yueqing can be considered representative of the Zhejiang Province.

This study aimed to evaluate the prevalence of blindness, VI and the cataract surgical services in people aged ≥50y in rural Yueqing using the RAAB technique.

PARTICIPANTS AND METHODS

Ethical Approval All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study is approved by the Ethics Committee of Eye Hospital and School of Ophthalmology and Optometry, Wenzhou Medical University on July 24, 2018, KYK [2017] No. 37. Written informed consent was obtained.

This is a population-based survey using RAAB technique established by the International Center for Eye Health[7]. Individuals who required cataract operations were referred to a local tertiary ophthalmic center for treatment. Three clinical survey teams, each consisting of an ophthalmologist, an ophthalmic assistant and a local community health worker, were trained by certified RAAB trainers with reasonable interobserver concordance, as the standard established by the RAAB protocol.

In China, around 60 million people experience VI, with one-sixth of them being 70 years of age or older[3]. For this study, there were 256 enumeration areas with a total population of 383 109 in the survey area of Yueqing. An enumeration area was a village or community with a population of more than 500. According to the China Statistical Yearbook 2016, the proportion of people aged ≥50y in China is 29.32%. Accordingly, the target population for this survey was estimated to be 112 328 people in this area. Given a confidence level of 95%, an estimated precision of 25%, a design effect of 1.5 for a cluster size of 50 and a response rate of 90%, the required sample size of 4326 calculated by the RAAB6 software. Therefore, it was determined that 87 clusters of 50 individuals aged ≥50y would be needed.

Compact segment sampling (CSS) was used to select households within clusters for the survey[17]. For CSS, each enumeration area was divided into segments, each with approximately 50 individuals aged ≥50y and each given a number. For a selected enumeration area, all the segment numbers were written on small pieces of paper and one was randomly chosen. In the area of a selected segment, the survey teams conducted door-to-door visits at households until 50 individuals aged ≥50y were enumerated. For residents known to be aged ≥50y but unavailable, these individuals were enumerated, and the survey teams made no less than two attempts to visit them at other times. If the number of eligible individuals was less than 50 after completing all household visits in a selected segment, the nearest segment in the same enumeration area was visited to complete the cluster.

VA testing and standardized ophthalmic examinations were performed according to the RAAB protocol[18]. WHO definitions were used to define blindness, SVI, and VI. Blindness was defined as a PVA of <3/60 in the better eye, SVI was defined as a PVA of ≥3/60 to <6/60 in the better eye, and VI was defined as a PVA of ≥6/60 to <6/18 in the better eye.

Data for this survey were initially recorded on-site using electronic devices to ensure accuracy and reduce transcription errors, with entries directly entered into the RAAB data management software. This process helped streamline data collection and minimize delays between recording and analysis.

Statistical Analysis The RAAB software package was used to import data and standardise statistical analysis. Unadjusted prevalence of blindness, SVI and VI as well as causes of VI were generated using the RAAB software package. Age- and gender-adjusted prevalence of blindness, SVI and VI were calculated according to the 2010 Population Census of China using SPSS 25.0 (SPSS for Windows, Chicago, Illinois, USA). Logistic regression analysis was performed to examine the relationship between potential risk factors and postoperative visual outcomes, specifically poor VA (VA<6/60). The analysis adjusted for key confounding variables, including age, gender, preoperative ocular comorbidities, hospital type (government *vs* private), and whether the patient underwent bilateral surgery. Odds ratios (ORs) with 95% confidence intervals (CIs) were used to quantify the strength of associations.

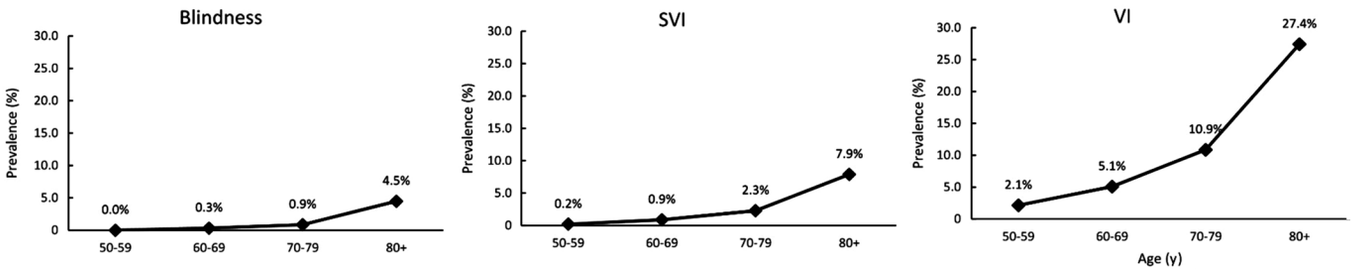

Figure 1 Prevalence of blindness, SVI, and VI increased with age SVI: Severe visual impairment; VI: Visual impairment.

Table 1 Prevalence of blindness, SVI, and VI stratified by gender

Groups	Male (*n*=1561)			Female (*n*=2559)			Total (*n*=4120)		
	n	Crude prevalence, % (95%CI)	Adjusted prevalence, % (95%CI)[a]	*n*	Crude prevalence, % (95%CI)	Adjusted prevalence, % (95%CI)[a]	*n*	Crude prevalence, % (95%CI)	Adjusted prevalence, % (95%CI)[b]
Blindness	13	0.8 (0.4–1.3)	0.4 (0.1–0.6)	26	1.0 (0.6–1.4)	0.7 (0.4–1.0)	39	0.9 (0.7–1.2)	0.5 (0.3–0.7)
SVI	11	0.7 (0.3–1.1)	0.3 (0–0.6)	33	1.3 (0.9–1.7)	1.0 (0.6–1.4)	44	1.1 (0.8–1.4)	0.7 (0.4–1.0)
VI	102	6.5 (5.3–7.8)	3.8 (2.8–4.7)	179	7.0 (6.0–8.0)	5.5 (4.6–6.4)	281	6.8 (6.1–7.6)	4.8 (4.2–5.5)
Total	126	8.1 (6.7–9.4)	4.4 (3.4–5.4)	238	9.3 (8.2–10.4)	7.2 (6.2–8.2)	364	8.8 (8.0–9.7)	6.0 (5.3–6.8)

CI: Confidence interval; SVI: Severe visual impairment; VI: Visual impairment. Blindness was defined as a presenting visual acuity (PVA) in the better eye of <3/60. SVI was defined as a PVA in the better eye of <6/60 and ≥3/60. VI was defined as a PVA in the better eye of <6/18 and ≥6/60. [a]Standardized by age to the 2010 Population Census of China; [b]Standardized by age and gender to the 2010 Population Census of China.

Table 2 Causes of blindness, SVI, and VI *n* (%)

Parameters	Blindness	SVI	VI	Total
Cataract, untreated	22 (56.4)	46 (55.4)	217 (59.6)	285 (58.6)
Other posterior segment	10 (25.6)	20 (24.1)	87 (23.9)	117 (24.1)
AMD	2 (5.1)	7 (8.4)	16 (4.4)	25 (5.1)
Cataract surgery complications	2 (5.1)	2 (2.4)	6 (1.6)	10 (2.1)
Aphakia, uncorrected	1 (2.6)	2 (2.4)	3 (0.8)	6 (1.2)
Refractive error	0	0	10 (2.7)	10 (2.1)
Trachoma corneal opacity	0	0	0	0
Other corneal opacity	1 (2.6)	2 (2.4)	7 (1.9)	10 (2.1)
Phthisis	0	0	0	0
Onchocerciasis	0	0	0	0
Glaucoma	0	1 (1.2)	5 (1.4)	6 (1.2)
Diabetic retinopathy	0	2 (2.4)	9 (2.5)	11 (2.3)
All globe/CNS abnormalities	1 (2.6)	1 (1.2)	4 (1.1)	6 (1.2)
Total	39 (100)	83 (100)	364 (100)	486 (100)

SVI: Severe visual impairment; VI: Visual impairment; AMD: Age-related macular degeneration; CNS: Central nervous system.

RESULTS

Overall, 4350 individuals aged ≥50y were enumerated, of whom 4120 (response rate, 94.7%) participants finally completed the ophthalmic examination required for the survey. In general, 20 individuals (0.5%) were not available, 205 individuals (4.7%) refused to participate and five individuals (0.1%) were not capable of completing the survey.

As shown in Table 1, there were no differences in the prevalence of blindness, SVI or VI between men and women (χ^2=0.621, P=0.34; χ^2=0.86, P=0.50; χ^2=0.323, P=0.57, respectively).

In this population, the prevalence of blindness, SVI and VI increased with age, as detailed in Figure 1.

The leading cause of blindness, SVI, and VI in the study was untreated cataracts, followed by other posterior segment disorders. AMD was also identified as a significant contributor. Overall, the majority of cases of blindness, SVI, and VI were attributed to avoidable causes, as shown in Table 2.

In this study, VI was defined based on PVA, which refers to the VA of participants as they presented at the time of examination, including the use of any corrective measures such as eyeglasses or contact lenses. Refractive errors are indeed a common cause of VI, particularly when uncorrected. However, in our study, only 2% of cases were attributed to refractive errors as a cause of VI. This seemingly low percentage can be explained by the fact that many participants likely had already corrected their

refractive errors through the use of spectacles or other visual aids, which improved their PVA. As a result, refractive errors were not recorded as a major cause of VI. Additionally, the relatively low prevalence of refractive error-related VI in this population may reflect the accessibility of optometric services and the availability of corrective lenses, which help mitigate the impact of refractive errors on PVA.

By eyes, the cataract surgical coverage (CSC) was 18.0% for a PVA of <3/60, 16.1% for a PVA of <6/60, and 9.6% for a PVA of <6/18. By person, the CSC rates increased to 25.6%, 22.9%, and 14.8%, respectively. CSC is a community-based indicator that compares the proportion of people who have undergone surgery (aphakia and pseudophakia) in the total population[19]. The main barrier to cataract surgery was a lack of knowledge or awareness about cataracts, reported by 64% of participants. Other significant barriers included fear of surgery (20%), financial constraints (10%), and difficulties accessing healthcare facilities (6%). This finding is similar to a previous research, which found that the most commonly reported barriers were waiting for the cataract to mature (18.7%), fear of surgical complications (16.7%), distance from an eye health institution (16.4%), and lack of income/cost for surgery (11.5%)[20].

A total of 280 individuals (415 eyes) were reported to have undergone cataract surgeries, and 135 (48.2%) individuals received surgery in both eyes. Of the 415 eyes operated on for cataracts, 403 (97.2%) eyes were implanted with intraocular lenses and 12 (2.9%) eyes were aphakic. After surgery, 68 (16.4%) eyes had a poor outcomes (VA<6/60), 44 (10.6%) had a borderline outcomes (VA >6/60 and <6/18), and 303 (73.0%) had a good outcomes (VA>6/18) with available correction. The main causes of poor VA after cataract surgery were ocular comorbidities (54.4%), surgical complications (33.8%) and long-term complications of cataract surgery (8.8%).

Among the 415 eyes that underwent cataract surgery, 267 (64.3%) received cataract surgery in government hospitals and 148 (35.7%) received cataract surgery at private hospitals. There were no significant differences in the proportions of the ratio of good (PVA≥6/18) to poor (PVA<6/60) post-cataract surgery visual outcomes between government hospitals and private hospitals (χ^2=0.873, P=0.350; χ^2=2.608, P=0.106, respectively).

In this study, the effective cataract surgical coverage (eCSC) was found to be 58.3%. This percentage reflects the proportion of individuals who have undergone cataract surgery and achieved a good visual outcome (VA>6/18) relative to the total population in need of surgery.

Logistic Regression Analysis Results After adjusting for potential confounders, including age, gender, preoperative ocular comorbidities, hospital type, and bilateral surgery, logistic regression analysis revealed several significant associations with poor postoperative visual outcomes (VA<6/60). As shown in Table 3, patients aged 70y or older had a significantly higher risk of poor visual outcomes (OR=2.45, 95%CI: 1.60–3.75, P<0.001). Preoperative ocular comorbidities were also associated with a markedly increased risk of poor vision after surgery (OR=3.20, 95%CI: 2.10–4.88, P<0.001). Patients who underwent surgery in private hospitals had a higher likelihood of poor visual outcomes compared to those treated in government hospitals (OR=1.65, 95%CI: 1.10–2.47, P=0.02). Bilateral surgery, however, was not significantly associated with poor outcomes (OR=1.12, 95%CI: 0.78–1.60, P=0.52), nor was gender (male; OR=0.90, 95%CI: 0.70–1.25, P=0.60). These findings suggested that age and preoperative ocular comorbidities were the primary factors influencing postoperative visual outcomes, with hospital type also playing a significant role.

Table 3 Logistic regression results

Variable	Odds ratio	95%CI	*P*
Age≥70y	2.45	1.60–3.75	<0.001
Preoperative ocular comorbidities	3.20	2.10–4.88	<0.001
Private hospital surgery	1.65	1.10–2.47	0.02
Bilateral surgery	1.12	0.78–1.60	0.52
Gender (male)	0.90	0.70–1.25	0.60

DISCUSSION

To our knowledge, this is the first study to investigate the prevalence and main causes of blindness, SVI and VI, as well as the CSC rate, surgery outcomes and barriers to access cataract surgery service in a population aged ≥50y in economically developed areas of eastern China. In this study, we found that the crude prevalence rates of blindness, SVI, and VI in this population were 0.9%, 1.1%, and 6.8%, respectively. Age- and gender-adjusted prevalence of blindness, SVI and VI were 0.5%, 0.7%, and 4.8%, respectively, in this area. Untreated cataracts, other posterior segment disorders and AMD were the main causes of blindness, SVI and VI. The CSC of individuals with blindness was 25.6%, and the main barrier to cataract surgery was a lack of awareness regarding cataracts.

The crude prevalence of blindness (0.9%) in this survey was lower than has been reported in other population-based studies using the RAAB technique in China[11-14], as well as the rate (2.29%) reported in a Chinese nine-province survey[21]. The age- and gender-adjusted prevalence of blindness, SVI and VI in our survey were also lower than the estimates from other RAAB surveys in China that has been standardised to the Population Census 2010 of China[14]. This discrepancy might be attributed to the relatively high socioeconomic status of people in the areas of eastern China. Zhejiang Province is located in the southeast coast of China. The per capita gross domestic

product in Zhejiang Province is higher than in Yunnan Province, Hainan Province or the Inner Mongolia Autonomous Region, and it has been proven that socioeconomic level has a strong negative association with the prevalence rates of VI and blindness[22-24]. Another underlying reason for this discrepancy may be that the national efforts to improve eye health planning and resource allocation over the past two decades have led to a decline in the burden of blindness and VI in China.

In this survey, the main cause of blindness, SVI and VI was untreated cataracts, followed by other posterior segment disorders and AMD. Other posterior segment disorders refer to the fundus diseases that cannot be determined excluding glaucoma, diabetic retinopathy and AMD, and further study is required to identify these disorders. In addition to identifying the main causes of VI, it is important to consider the demographic characteristics of the study population, particularly the age distribution, as it may have a significant impact on the study outcomes. A comparison between the age distribution of the study sample and that of the general population in Zhejiang Province highlights potential representational imbalances.

In the study, the age distribution of the population aged ≥50y was as follows: 50–59y (25.1%), 60–69y (30.8%), 70–79y (27.3%), and ≥80y (16.8%).

1) Comparison with Zhejiang Province population data

According to the 2023 Zhejiang Provincial Population Survey, the age distribution for the total population in Zhejiang Province was: 0–15y (13.4%), 16–59y (65.1%), and ≥60y (21.5%), with individuals aged ≥65y making up 15.4% of the population[25].

When comparing the study sample to the general population of Zhejiang Province, individuals aged ≥80y in the study (16.8%) are significantly over-represented compared to the provincial population, where only 15.4% are aged ≥65y. Additionally, the 50–59 years age group in the study (25.1%) appears under-represented when compared to the broader provincial population, where individuals aged 16–59y make up 65.1%. This imbalance may affect the generalizability of the results, particularly since VI is more prevalent in older age groups.

2) Comparison with national population data

According to the national population data for 2023, the age distribution for the total population was: 0–14y (17.95%), 15–59y (63.35%), and ≥60y (18.7%), with individuals aged ≥65y making up 13.5%[26].

When compared to the national population, the study similarly over-represents individuals aged ≥60y, particularly those aged ≥80y. While the national population has 18.7% aged ≥60y, the study population is skewed towards older individuals, with a significant portion (16.8%) aged ≥80y alone. At the same time, the 50–59y age group in the study is somewhat under-represented compared to the national figure, where 63.35% of the population is aged 15–59y. The over-representation of older individuals, particularly those aged ≥80y, in comparison with both the Zhejiang Province and national populations suggests that the study sample may not fully represent the age distribution of the general population. This could potentially affect the prevalence rates of VI and blindness, as these conditions are more common in the elderly. Although the study employs age-adjusted analysis to mitigate this bias, it is important to acknowledge these demographic discrepancies when interpreting the findings.

The logistic regression analysis showed that older age, preoperative ocular comorbidities, and private hospital surgery were significantly associated with poor postoperative visual outcomes, while gender and bilateral surgery were not. The logistic regression analysis highlights that older age and preoperative ocular comorbidities are significant risk factors for poor postoperative visual outcomes, suggesting the need for careful preoperative assessment in these groups. Patients who underwent surgery in private hospitals also had a higher likelihood of poor outcomes, possibly indicating variations in surgical quality or postoperative care between private and government facilities. Despite concerns, bilateral surgery and gender did not show significant associations with poor visual outcomes, indicating these factors may not critically influence surgical success.

No trachoma corneal opacity was found in the blindness, SVI and VI populations. Under the leadership of the government and the efforts of all parties, the major blinding eye diseases [cataract, trachoma, onchocerciasis, child blindness (including vitamin A deficiency), ametropia and low vision] have been well controlled in China, especially in the prevention and treatment of trachoma. In 2014, the Chinese government announced that it had achieved the goal of eliminating blinding trachoma ahead of schedule, and trachoma was no longer a public health problem in China.

Uncorrected refractive errors in the elderly population were no longer a problem in this area either. This finding is most likely attributed to the government's implementation of an eye health project for the benefit of the public over the past two years, as well as the establishment of a number of optometry clinics. The increase in the proportion of other posterior segment disorders and AMD in patients with blindness, MSVI and VI might be related to urbanization, aging of the population, and lifestyle change in China over the last decades.

Cataracts accounted for 58.6% of all VI. However, the CSC rate was lower in Yueqing than has been reported in other areas of China and other developing countries[11-14,23]. In this survey, the main barrier to cataract surgery was a lack of knowledge or awareness of cataracts, similar to the results of previous studies

in China and other developing countries[27-28]. Therefore, it is important to strengthen eye health education for the elderly population in this area in order to improve their awareness, especially the knowledge of cataracts, and to increase the CSC rate in Yueqing in order to further decrease the prevalence of blindness and VI in this area.

WHO recommends a post-cataract surgery goal of at least 80% of the eyes reaching a good outcome (VA >6/18) with up to 5% experiencing a poor outcome (VA<6/60)[29]. The proportions of both good outcomes (73.0%) and poor outcomes (16.4%) identified in this study did not reach the recommended target. However, our findings were similar to those reported in other population-based surveys using the RAAB technique in China[11-14]. Similar results have also been found in other low- and middle-income countries[15-16,30]. These findings suggest that continuous efforts should be made not only to improve the CSR, but also to improve outcomes of cataract surgery. Efforts have been made in Yueqing to improve outcomes of cataract surgery by subsidizing local doctors to further study cataract surgery skills and by sending experienced and skilled cataract surgeons locally to serve patients directly and to provide hands-on operation training for local cataract doctors.

In this study, eCSC was found to be 58.3%. This percentage reflects the proportion of individuals who have undergone cataract surgery and achieved a good visual outcome (VA>6/18) relative to the total population in need of surgery. When compared to global data, this eCSC aligns closely with findings from McCormick *et al*[31], who reported a median eCSC of 60.5% in high-income countries and 14.8% in low-income countries across 55 countries surveyed between 2003 and 2021. This suggests that the cataract surgical services in the study region perform relatively well in terms of both access and outcomes. For instance, in high-income countries such as Hungary, the eCSC reached 70.3%, whereas in low-income settings such as Guinea Bissau, it was only 3.8%[31]. However, while the eCSC in our study region is comparable to high-income countries, there remains room for improvement. The World Health Organization has set a global target of a 30-percentage point increase in eCSC by 2030. Achieving this will require further efforts to improve access to cataract surgery for underserved populations and to ensure high-quality surgical outcomes. The main barriers to achieving this goal, as identified in our study, include fear of surgical complications, cost, and distance to healthcare facilities. Furthermore, the main causes of poor visual outcomes in this study—ocular comorbidities, surgical complications, and long-term complications—suggest a need for ongoing quality improvement initiatives. These factors should be addressed to reduce the number of patients who experience suboptimal results following cataract surgery.

Although the cost of cataract surgery was reported to be lower in private hospitals than in government hospital, the post-cataract surgery visual outcomes of private hospitals were similar to those of government hospitals, most cataract patients still preferred to undergo cataract surgery in government hospitals. Their reasons were varied, including social and political systems, cultural traditions and people's concepts. One main reason was that China's public hospitals have great advantages over private hospitals in terms of medical resources, including funds, professionals, medical beds, medical facilities, and equipment. However, China's private hospitals have been rapidly developing in recent years, with the support of the government, and private hospitals will likely play a greater role in the prevention of blindness in China in the future.

There are a few limitations in this study. First, our study did not determine the causes of posterior segment diseases in detail due to the limitations of the portable equipment, thus, further study may be needed in the future to conduct detailed posterior segment assessment. Second, only people aged ≥50y were investigated in this study, which cannot reflect the prevalence and causes of blindness and VI of the whole population. Moreover, we only examined people whose VA lower than 6/12, some diseases that do not seriously affect vision cannot be detected. Another limitation of this study is the slight difference observed between the age-adjusted prevalence and the crude results. This discrepancy suggests that some degree of selection bias may have occurred during the sampling process. Selection bias could influence the generalizability of the study findings to the wider population, particularly in relation to age distribution.

In summary, the prevalence of blindness, SVI and VI in a population aged ≥50y in Yueqing were lower than has been reported in previous RAAB studies in China. The main cause of blindness, MSVI and VI was identified to be cataracts, followed by other posterior segment disorders and AMD. CSC was relatively low in this area, thus, increased eye health education and a more effective allocation of medical resources may decrease the rates of blindness and VI in this region. The results of this study can provide valuable information for planning of future public eye health services in economically developed areas in eastern China.

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