



**QUEEN'S  
UNIVERSITY  
BELFAST**

## **Barriers to uptake of cataract surgery among elderly patients in rural China: a cross-sectional study**

Ma, X., Hao, J., Jan, C., Wan, Y., Xie, Y., Liu, C., Shi, Y., Hu, A., Cao, K., Congdon, N., Rozelle, S., Dong, Z., & Wang, N. (2024). Barriers to uptake of cataract surgery among elderly patients in rural China: a cross-sectional study. *BMJ Open*, 14(1), Article e076116. <https://doi.org/10.1136/bmjopen-2023-076116>

**Published in:**  
BMJ Open

**Document Version:**  
Publisher's PDF, also known as Version of record

**Queen's University Belfast - Research Portal:**  
[Link to publication record in Queen's University Belfast Research Portal](#)

### **Publisher rights**

Copyright 2024 the authors.

This is an open access Creative Commons Attribution-NonCommercial License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits use, distribution and reproduction for non-commercial purposes, provided the author and source are cited

### **General rights**

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

### **Take down policy**

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact [openaccess@qub.ac.uk](mailto:openaccess@qub.ac.uk).

### **Open Access**

This research has been made openly available by Queen's academics and its Open Research team. We would love to hear how access to this research benefits you. – Share your feedback with us: <http://go.qub.ac.uk/oa-feedback>

# BMJ Open Barriers to uptake of cataract surgery among elderly patients in rural China: a cross-sectional study

Xiaochen Ma ,<sup>1</sup> Jie Hao,<sup>2,3</sup> Catherine Jan ,<sup>4</sup> Yue Wan,<sup>2</sup> Yuan Xie,<sup>2</sup> Chengfang Liu,<sup>5</sup> Yaojiang Shi,<sup>6</sup> Ailian Hu,<sup>2,3</sup> Kai Cao,<sup>2,3</sup> Nathan Congdon,<sup>7,8</sup> Scott Rozelle,<sup>9</sup> Zhe Dong,<sup>2</sup> Ningli Wang <sup>2</sup>

**To cite:** Ma X, Hao J, Jan C, *et al.* Barriers to uptake of cataract surgery among elderly patients in rural China: a cross-sectional study. *BMJ Open* 2024;**14**:e076116. doi:10.1136/bmjopen-2023-076116

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2023-076116>).

XM, JH and CJ contributed equally.

XM, JH and CJ are joint first authors.

Received 29 May 2023

Accepted 15 November 2023



© Author(s) (or their employer(s)) 2024. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

## Correspondence to

Ningli Wang;  
wningli@vip.163.com and  
Zhe Dong;  
dongzhe0@126.com

## ABSTRACT

**Objective** To investigate factors that differentiate elderly adults in rural China who accept free vision screening and cataract surgery from those who could benefit from vision care but refuse it when offered.

**Design** We conducted a population-based, cross-sectional study between October and December 2016. Logistic regression models were used to examine the predictors of accepting free vision screening and cataract surgery.

**Setting** Rural communities in Handan, China.

**Participants** Adults aged 50 years or older, with presenting visual acuity  $\leq 6/18$  in the better seeing eye, suspected by examining ophthalmologist to be due to cataract.

**Results** Among 613 persons with cataract identified on a population basis, 596 (97.2%) completed the household survey (mean (SD) age, 71.5 (10.0) years; 79.8% female). A total of 214 persons (35.9%) refused participation, while 382 (64.1%) took part in the vision screening. A total of 193 (50.5%) participants were found eligible for surgery, while 189 (49.5%) were not. Among 99 randomly selected participants who were offered immediate free surgery, surgery was accepted by 77 participants (77.8%) and refused by 22 (22.2%). In the multivariate model, being engaged in income-generating activities ( $p < 0.01$ ), self-reported better physical capacity ( $p < 0.001$ ) and having had a recent physical examination ( $p = 0.01$ ) were significantly associated with acceptance of vision screening. The only variable significantly associated with acceptance of surgery was presenting visual acuity, with better vision inversely associated with acceptance of surgery ( $p < 0.05$ ) models.

**Conclusion** Our results suggest that refusal of basic eye examinations may be at least as important a determinant of low surgical rates in rural China as lack of acceptance of surgery itself.

## INTRODUCTION

Cataract is the world and China's leading cause of blindness.<sup>1–3</sup> Cataract surgery is the only available treatment and has been rated among the most cost-effective procedures in medicine by WHO.<sup>4 5</sup> However, cataract surgical coverage rates are low in rural China. A recent multiprovince study found

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study reports a rural population-based cross-sectional sample, with both individual and household-level potential determinants of elderly adults' decisions to accept or refuse free vision screening and cataract surgery.
- ⇒ The study population is highly relevant to the problem of increasing service uptake, and is of recent vintage, reflecting important recent changes in the Chinese healthcare system, such as the wide adoption of the New Cooperative Medical System health insurance system.
- ⇒ The number of persons eligible for cataract surgery was relatively modest, a direct consequence of the population-based design, and half of these were removed from consideration by having been randomised to the control group.

that as few as 43% of rural patients bilaterally blind from cataract had undergone surgery.<sup>6</sup> Trials have found that the uptake of offered surgery is only 20–30% in rural China, even when patients have significant vision loss and surgery is offered free of cost.<sup>7 8</sup>

A number of studies including our own<sup>9</sup> have found various barriers to the uptake of cataract surgery in China: cost, including direct out-of-pocket surgical expense and the cost of transportation and accommodation<sup>10 11</sup>; lack of knowledge about cataract and surgery<sup>11</sup>; and concerns about the quality of local surgeons.<sup>12</sup> Prior work in this area has several shortcomings. First, many existing studies<sup>9 10 12</sup> used data from prior to 2009, the year China announced systematic health reforms.<sup>13 14</sup> Access to cataract surgery in rural areas has since improved substantially due to the universal coverage under the New Cooperative Medical System (NCMS).<sup>15</sup> Second, while studies from lower and middle-income countries show that health decisions are usually made at the household level,<sup>16</sup> most existing studies in China have been limited to

considering patient-level data, mostly concerning clinical rather than socioeconomic variables.

To address these limitations, in the present study we carried out a population-based household survey to understand factors that differentiate elderly adults in rural China who accept free vision screening and cataract surgery from those who could benefit from vision care but refuse it when offered. We report in the current manuscript on:

- ▶ Determinants of acceptance of free vision screening among elderly rural dwellers.
- ▶ Determinants of acceptance of free surgery among elderly patients with visually significant cataract.

## METHODS

### Setting

Our study cohort was drawn from an ongoing population-based study, the Handan Eye Study (HES), which was designed to determine the prevalence and impact of visual impairment and major eye disorders in rural adult Chinese people.<sup>17</sup> It was conducted in Yongnian County, Handan Prefecture, located in southern Hebei province, about 500 km south of Beijing. Yongnian has demographic characteristics similar to other rural Chinese locations according to the National Census,<sup>18</sup> and the cataract surgical rate in the region is similar to other parts of rural China.<sup>4</sup> Thus, our sampling region is demographically and epidemiologically representative of rural China.

### Sampling and eligibility criteria

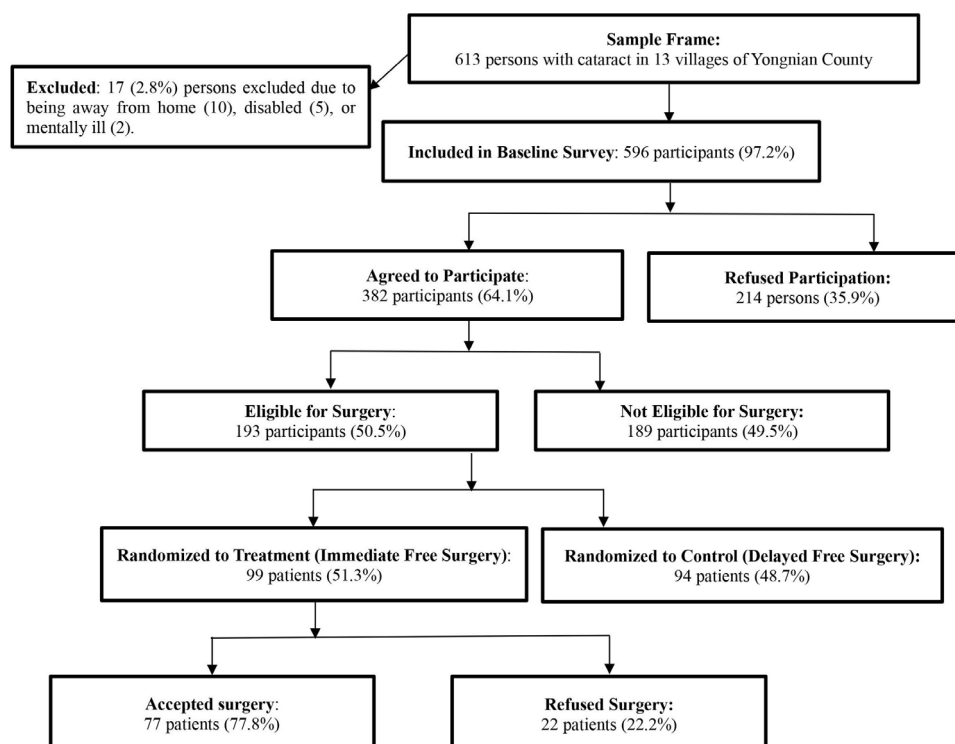
The original HES sample consisted of 6830 participants of Han ethnicity aged 30 years and older from 13 villages who

underwent visual acuity screening in 2012.<sup>19</sup> In October 2016, a list was compiled of 784 participants from all 13 villages in the original HES study who met the following criteria: aged 50 years or older in 2016; presenting visual acuity (PVA) in 2012  $\leq 6/18$  (logarithm of the minimum angle of resolution (LogMAR) 0.5) in the better seeing eye, suspected by the examining ophthalmologist in 2012 to be due to cataract. With the help of local health workers, our study personnel identified potential participants who had died or moved out of the area, leaving a cohort of 613 persons on whom analyses in the current study are based (figure 1).

### Questionnaire

During October and December 2016, all participants were administered a home visit survey, requiring approximately 30–45 min per household. This questionnaire consisted of the following seven sections (see details of the questionnaire in online supplemental material):

1. Basic household demographic characteristics: gender, age, educational level and number of household members.
2. Household wealth, measured by ownership of a list of 13 items (TV, washing machine, refrigerator, internet access, automobile, etc).
3. Being engaged in income-generating activities<sup>20</sup> (none, farming only, off-farm only, both).
4. Awareness, knowledge and attitudes about cataract and cataract surgery: whether the participant believed he/she had cataract, whether cataract could be treat-



**Figure 1** Study flow chart.

ed surgically and perception of the quality of local surgeons.

5. Self-reported physical capacity: a list of nine questions from Nagi's upper and lower extremity assessment<sup>21</sup> was used to assess physical activities, including bending down/kneeling/squatting, climbing 10 steps, walking different distances (100/500/1000 m), holding things with the fingers, holding 5 kg with one hand, etc.
6. Self-reported mental health: the 10-question version of the Center for Epidemiological Studies-Depression Scale was used to assess the depressive symptoms including 10 items about feelings and behaviour during the last week, including bother, attention, depression, difficulty, future, fear, sleep, happiness, loneliness and life.<sup>22</sup>
7. Utilisation of healthcare: whether a general physical examination or inpatient services had been received in the last 12 months.

### Ophthalmic screening

In late December 2016, participants who had completed the household survey were referred to the Yongnian County Hospital for a free vision screening to test to determine eligibility for surgery as defined below. The protocol for the screening examination was the same as had been used for the original sample in 2012. The screening examination was announced door to door prior to the day of screening by local health workers. On the day of screening, participants from each village were brought together to the county hospital, in vans arranged by study personnel and local health workers. At the hospital, all participants were registered using a standardised case report form. Two ophthalmic nurses measured the PVA of each person separately in each eye using a Snellen chart at a distance of 5 m. An ophthalmologist then carried out a full ocular examination with dilation of the pupil to determine eligibility for cataract surgery, which required PVA  $\leq 6/18$  in the better seeing eye, thought by the examiner to be due to cataract.

Persons who were unwilling to participate in the vision screening, and those who were eligible for surgery but not willing to accept it, were asked about their reasons for refusal using a short questionnaire. Based on previous studies on barriers to the uptake of cataract surgery,<sup>7-11</sup> the questionnaire included the following seven reasons: (1) sick or disabled; (2) outmigrated for work; (3) too old to leave home; (4) dead; (5) feel current vision adequate; (6) already did screening and/or surgery; (7) others, please specify.

### Statistical methods

Descriptive analysis and logistic regression models were used to investigate the determinants of the two outcome variables: acceptance of free vision screening among selected rural dwellers and acceptance of free surgery among eligible patients with cataract. Visual acuity values are presented as Snellen fractions but were converted to LogMAR values for analysis. Visual acuity data collected in

2012 were used in the analysis of determinants of acceptance of free vision screening, as these were available for all potential participants, irrespective of acceptance or refusal of screening in 2016. Visual acuity data from 2016 were used in analysis on acceptance of free surgery. Household wealth was calculated by summing the values, as reported in the China Rural Household Survey Yearbook (Department of Rural Surveys, National Bureau of Statistics of China, 2016), of items on a list of 13 reported as being owned by the household.

Differences in baseline household demographic characteristics, wealth, productive activities, participants' awareness, knowledge and perception about cataract and cataract surgery, self-reported physical and mental health and healthcare utilisation were compared between groups accepting and refusing vision screening and surgery using the t-test. Multivariate logistic regression models were used to examine the potential predictors of the two main study outcomes: acceptance of vision screening and cataract surgery. All statistical analyses were performed using STATA V.15.1 (StataCorp, College Station, Texas).

### Patient and public involvement

No patient was involved in the protocol's development. Written informed consent was obtained from all participants.

### RESULTS

Among 613 persons with cataract identified on a population basis in Yongnian County, 596 (97.2%) took part in the baseline household survey, while 17 (2.8%) were excluded due to being away from home, disabled or mentally ill (figure 1). Among these, 214 persons (35.9%) refused participation, while 382 (64.1%) took part. A total of 193 participants (50.5%) were found eligible for surgery, while 189 (49.5%) were not. Eligible participants were randomised to treatment (immediate free surgery, n=99, 51.3%) or control (delayed surgery, n=94, 48.7%). Within the treatment group, surgery was accepted by 77 participants (77.8%) and refused by 22 participants (22.2%) (figure 1).

Compared with eligible persons accepting the screening eye examination, those refusing it were significantly older ( $p<0.001$ ), more likely to be illiterate ( $p<0.01$ ), have no current income-generating work ( $p<0.001$ ), self-reported lower physical capacity ( $p<0.001$ ) and no physical examination over the last 12 months ( $p<0.01$ ). Other characteristics did not differ significantly (table 1). Participants who refused surgery had significantly worse PVA in the better seeing eye than those accepting surgery ( $p<0.05$ , table 1).

The leading cause for refusing screening, reported by over half of potential participants (115/214=54%), was poor health (table 2). Regarding refusal of surgery, the two leading causes were satisfaction with current vision (7/22=32%) and lack of an accompanying family



**Table 1** Baseline characteristics of participants

Characteristics	Accepted screening n=382	Refused screening n=214	P value	Accepted surgery n=77	Refused surgery n=22	P value
<b>Patient characteristics</b>						
Age (years) mean (SD)	70.0 (9.0)	74.1 (11.0)	<0.001	70.9 (8.8)	75.1 (10.2)	0.060
Male sex, n (%)	124 (32.6)	56 (26.1)	0.109	28 (36.4)	9 (40.9)	0.701
Illiterate, n (%)	210 (55.1)	145 (67.3)	0.004	44 (57.1)	9 (40.9)	0.181
Presenting visual acuity in better eye, LogMAR (Snellen equivalent)	0.6 (6/24)	0.6 (6/24)	0.505	0.7 (6/30)	0.8 (6/38)	0.026
Underwent surgery prior to the project, n (%)	56 (14.7)	41 (19.2)	0.154	9 (11.7)	2 (9.1)	0.736
Aware of cataract, n (%)	341 (90.0)	174 (85.7)	0.166	70 (90.9)	19 (86.4)	0.537
Believes cataract can be treated surgically, n (%)	207 (54.6)	103 (50.7)	0.405	35 (45.5)	8 (36.4)	0.453
Perceives surgeon to be of high or very high quality, n (%)	158 (41.7)	89 (43.8)	0.664	27 (35.1)	10 (45.5)	0.380
Being engaged in income-generating activities, n (%)						
None	179 (46.9)	149 (69.3)	<0.001	41 (53.2)	16 (72.7)	0.356
Farming only	141 (36.9)	36 (16.4)		22 (28.6)	4 (18.2)	
Off-farm employment only	27 (7.1)	6 (2.8)		6 (7.8)	1 (4.6)	
Both	32 (8.4)	12 (5.6)		8 (10.4)	1 (4.6)	
Self-reported physical capacity*, n (%)						
Bottom tercile	99 (26.1)	112 (55.5)	<0.001	23 (30.0)	6 (27.3)	0.602
Middle tercile	168 (44.3)	50 (24.6)		32 (41.6)	11 (50.0)	
Top tercile	112 (29.6)	41 (20.3)		22 (28.6)	5 (22.7)	
Self-reported mental health†, n (%)						
Bottom tercile	140 (36.9)	74 (36.5)	0.707	32 (41.6)	7 (31.8)	0.375
Middle tercile	124 (32.7)	63 (31.0)		20 (26.0)	10 (45.5)	
Top tercile	115 (30.3)	66 (32.5)		25 (32.5)	5 (22.7)	
Underwent physical examination over the past 12 months, n (%)	153 (40.1)	62 (29.0)	0.007	23 (29.9)	9 (40.9)	0.339
Received inpatient service over the past 12 months, n (%)	56 (14.7)	37 (17.8)	0.326	5 (6.5)	3 (13.6)	0.252
<b>Household characteristics</b>						
Number of family members living together, mean (SD)	3.3 (2.2)	3.2 (2.1)	0.656	3.4 (2.4)	3.6 (2.7)	0.690
Household wealth‡, n (%)						
Bottom tercile	125 (32.7)	72 (33.5)	0.533	24 (31.2)	10 (45.5)	
Middle tercile	126 (33.0)	75 (34.9)		27 (35.1)	6 (27.3)	0.429
Top tercile	131 (34.3)	68 (31.6)		26 (33.8)	6 (27.3)	

\*Questionnaire asked respondents to rate their ability to perform 9 selected physical tasks. Each task had four values: 1=I don't have any difficulty; 2=I have difficulty but can still do it independently; 3=I have difficulty and need help; 4=I cannot do it. A total value was summed and categorised into three terciles.

†Questionnaire asked about presence or absence of 10 selected mental conditions over the last week. Each condition had four values: 1=rarely or none of the time (<1 day); 2=some or a little of the time (1–2 days); 3=occasionally or a moderate amount of the time (3–4 days); 4=most of the time (5–7 days). A total value was summed and categorised into three terciles.

‡Questionnaire asked about ownership of 13 selected items as an index of household wealth.

LogMAR, logarithm of the minimum angle of resolution (0.1 change in LogMAR indicates one line change on the vision chart).

member (5/22=23%), which together accounted for over half of refusals.

In the multivariate model for determinants of accepting visual screening (table 3), being engaged in income-generating activities ( $p<0.001$ ), better self-reported physical capacity ( $p<0.001$ ) and having had a recent physical examination ( $p=0.01$ ) remained significantly associated with acceptance of vision screening.

In model of potential determinants of accepting surgery (table 4), better vision was inversely associated

with acceptance of surgery in the multivariate ( $p=0.05$ ) models. Other variables were not significantly associated with this outcome.

We also conducted sensitivity analysis using a variety of different vision variables, including (a) change in PVA (LogMAR) in better seeing eye between 2012 and 2016; (b) type of cataract (Lens Opacity Classification System (LOCS I), LOCS II and LOCS III); and (c) difference between the PVA (LogMAR) in the two eyes. Similar results were found in the multivariate logistic regression

**Table 2** Reasons for not participating in vision screening and refusing surgery

Reasons for not participating in screening	n	%
Sick or disabled	115	53.7
Outmigrated for work	35	16.4
Too old to leave home	20	9.4
Already did screening	6	2.8
Dead	1	0.5
Other	37	17.3
Total	214	100.0
Reasons for refusing surgery		
Felt current vision adequate	7	31.8
No one to accompany during surgery	5	22.7
Worried about outcome of surgery	4	18.2
Sick or disabled	3	13.6
Other	3	13.6
Total	22	100.0

model of acceptance of free vision screening (online supplemental appendix table 1) and the multivariate logistic regression model on the determinants of acceptance of free surgery (online supplemental appendix tables 2 and 3).

## DISCUSSION

China's cataract surgical rate remains lower than neighbouring countries such as India and Vietnam with lower per capita gross domestic product.<sup>15 23</sup> Results of the current study suggest that refusal of basic eye examinations may be at least as important a determinant of this low surgical rate as lack of acceptance of surgery itself. Nearly 40% of this population-based sample of rural dwellers, all of whom who had participated in an ophthalmic study 5 years previously, refused an eye examination that could potentially have led to free cataract surgery. This rate of refusal was nearly twice as high as the proportion refusing surgery itself (22.2%). Perhaps more important from the standpoint of devising interventions to improve uptake, those refusing eye examinations differed in a number of potentially important ways from those accepting them, whereas only PVA differentiated those accepting and refusing cataract surgery. This latter difference does not suggest obvious strategies to increase acceptance of surgery. Given the high proportion of persons refusing vision examinations due to self-perceived poor health, additional support for such persons (wheelchairs, accessible vans, etc) may be an effective way to increase uptake of initial examinations.

The relatively high rate of acceptance of surgery in the current study (78%) stands in distinction to two relatively recent trials which reported only 20–30% of rural Chinese patients accepting cataract surgery, even when surgery was offered free or educational interventions were used to

**Table 3** Multivariate logistic regression model of acceptance of free vision screening among elderly rural dwellers (n=596)

Variables	OR	(95% CI)
Patient characteristics		
Age (years)	0.992	(0.966, 1.018)
Male sex (%)	1.340	(0.846, 2.123)
Illiterate (%)	0.969	(0.629, 1.494)
Presenting VA (LogMAR) in better eye	1.028	(0.374, 2.823)
Conducted surgery prior to the project (%)	0.993	(0.710, 1.390)
Aware of cataract (%)	0.987	(0.568, 1.714)
Believe cataract can be treated surgically (%)	1.481	(0.826, 2.658)
Perceived local surgeon to be of high or very high quality (%)	1.014	(0.672, 1.531)
Being engaged in income-generating activities*	2.127**	(1.282, 3.529)
Self-reported better physical capacity†	2.644***	(1.743, 4.012)
Self-reported better mental health‡	0.812	(0.549, 1.200)
Had physical examination over the past 12 months	1.672**	(1.114, 2.511)
Received inpatient service over the past 12 months	0.746	(0.498, 1.116)
Household characteristics		
Number of family members living together	1.014	(0.924, 1.113)
Higher household wealth§	0.802	(0.515, 1.250)

\*Significant at 0.05. \*\*Significant at 0.01. \*\*\*Significant at <0.001.

\*Recoded as a binary variable. 0=none, 1=engaged in any of the income-generating activities (farming, off-farm employment, both).

†Recoded as a binary variable. 0=lower than average self-reported physical capacity, 1=higher than average self-reported physical capacity. Questionnaire asked respondents to rate their ability to perform 9 selected physical tasks. Each task had four values: 1=I don't have any difficulty; 2=I have difficulty but can still do it independently; 3=I have difficulty and need help; 4=I cannot do it. A total value was summed as physical capacity scores.

‡Recoded as a binary variable. 0=lower than average self-reported mental health, 1=higher than average self-reported mental health. Questionnaire asked about presence or absence of 10 selected mental conditions over the last week. Each condition had four values: 1=rarely or none of the time (<1 day); 2=some or a little of the time (1–2 days); 3=occasionally or a moderate amount of the time (3–4 days); 4=most of the time (5–7 days). A total value was summed as mental health scores.

§Recoded as a binary variable. 0=lower than average household wealth, 1=higher than average household wealth. Questionnaire asked about ownership of 13 selected items as an index of household wealth.

LogMAR, logarithm of the minimum angle of resolution (0.1 change in LogMAR indicates one line change on the vision chart); VA, visual acuity.

**Table 4** Multivariate logistic regression model on the determinants of acceptance of free surgery among elderly patients with cataract (n=99)

Variables	OR	(95% CI)
<b>Patient characteristics</b>		
Age (years)	0.919	(0.823, 1.025)
Male sex (%)	1.729	(0.372, 8.026)
Illiterate (%)	3.225	(0.728, 14.288)
Presenting VA (LogMAR) in better eye	0.029*	(0.001, 0.975)
Conducted surgery prior to the project (%)	2.992	(0.508, 17.634)
Aware of cataract (%)	3.553	(0.363, 34.749)
Believe cataract can be treated surgically (%)	1.634	(0.245, 10.893)
Perceived local surgeon to be of high or very high quality (%)	0.668	(0.158, 2.823)
Being engaged in income-generating activities*	0.609	(0.172, 2.155)
Self-reported better physical capacity†	1.372	(0.265, 7.098)
Self-reported better mental health‡	0.756	(0.177, 3.224)
Had physical examination over the past 12 months	0.382	(0.094, 1.548)
Received inpatient service over the past 12 months	0.374	(0.099, 1.408)
<b>Household characteristics</b>	0.557	(0.085, 3.638)
Number of family members living together	0.980	(0.755, 1.272)
Higher household wealth§	1.748	(0.428, 7.137)

\*Significant at 0.05. \*\*Significant at 0.01. \*\*\*Significant at <0.001.

\*Recoded as a binary variable. 0=none, 1=engaged in any of the income-generating activities (farming, off-farm employment, both).

†Recoded as a binary variable. 0=lower than average self-reported physical capacity, 1=higher than average self-reported physical capacity. Questionnaire asked respondents to rate their ability to perform 9 selected physical tasks. Each task had four values: 1=I don't have any difficulty; 2=I have difficulty but can still do it independently; 3=I have difficulty and need help; 4=I cannot do it. A total value was summed as physical capacity scores.

‡Recoded as a binary variable. 0=lower than average self-reported mental health, 1=higher than average self-reported mental health. Questionnaire asked about presence or absence of 10 selected mental conditions over the last week. Each condition had four values: 1=rarely or none of the time (<1 day); 2=some or a little of the time (1–2 days); 3=occasionally or a moderate amount of the time (3–4 days); 4=most of the time (5–7 days). A total value was summed as mental health scores.

§Recoded as a binary variable. 0=lower than average household wealth, 1=higher than average household wealth. Questionnaire asked about ownership of 13 selected items as an index of household wealth.

LogMAR, logarithm of the minimum angle of resolution (0.1 change in LogMAR indicates one line change on the vision chart); VA, visual acuity.

promote uptake.<sup>7,8</sup> This may reflect the fact that we decomposed acceptance of surgery into two steps: acceptance of the initial examination and then of surgery itself. Our overall rate of acceptance (49%), multiplying the observed rates for the two steps (64%\*78%), was more similar to previous reports, though still higher. Previous population studies in rural China have identified lack of confidence in local surgeons as an important barrier to acceptance of surgery,<sup>24</sup> and it is possible that ours having offered surgery by experts from one of China's most famous and respected eye hospitals (Beijing Tongren Hospital) might explain the higher rates of acceptance which we observed.

Our results suggest that promotion of the vision screening which can lead to cataract surgery could be an important strategy to increase cataract surgical coverage in rural Chinese settings. This is consistent with a study covering several dozen rural, county-level Chinese hospitals which identified participation in high-volume outreach screening activities as the single most significant predictor of a facility's 3-year increase in cataract surgical volume.<sup>25</sup> Active

outreach strategies have also been identified as a means to increase equity of surgical access, leading to higher levels of participation among women, the elderly and those with lower levels of education.<sup>12</sup> To successfully increase uptake of eye examinations, strategies would need to target those persons at the greatest risk of refusal, which in the case of the current study included the elderly, illiterate, and those with poor self-rated health, no productive work and having little contact with the healthcare system. The fact that these disadvantaged groups refused participation even when free eye examinations were offered on an outreach basis underscores the difficulty of eliciting their involvement in even the most basic of healthcare activities. Additionally, universal health coverage (UHC) is not universal without affordable, high-quality, equitable eye care such as cataract service.<sup>5</sup> As China advances its UHC in the Healthy China 2030 policy,<sup>26</sup> integrating eye health services with the multiple relevant components of health service delivery is crucial for improving the access to essential eye care services, particularly at the level of primary healthcare for those who are less likely to participate

in regular outreach eye examinations. Visual acuity testing or visual function questionnaires are practical ways to screen persons in residential facilities for the elderly. Where educational interventions and offers of free cataract surgery<sup>8</sup> have not been successful in motivating uptake of eye care services, there is the need for studies of other types of interventions, such as conditional cash transfers, which have been successful in motivating greater participation in healthcare services, for example, in-hospital delivery among women in India,<sup>27</sup> and which might be cost-effective, given evidence that cataract surgery can increase the economic productivity of patients and the families who care for them.<sup>20 28 29</sup>

Strengths of the current study include its population-based nature, which allowed us to study uptake of offered eye care services among persons who would be unlikely to seek out care spontaneously. Additionally, the study involved a rural Chinese population, highly relevant for the problem of increasing service uptake, and is of recent vintage, thus taking into account important recent changes in the Chinese healthcare system, such as the wide adoption of the NCMS health insurance system.

However, findings and implications of the present study need to be interpreted with caution in light of some limitations: First, the number of persons actually eligible for cataract surgery was relatively modest, a direct consequence of the population-based design, and half of these were removed from consideration by having been randomised to the control group in the parent trial. It is possible that more significant determinants of surgical uptake would have been elucidated with a larger sample size. Second, all participants in our study were drawn from a single rural county in Hebei province; this inevitably limits to some extent our ability to apply our results to other parts of rural China. Despite these limitations, the current report does offer useful insights into determinants of acceptance of basic eye examinations, which other research has suggested are a crucial gateway to sight-restoring cataract surgery.<sup>12</sup>

#### Author affiliations

<sup>1</sup>China Center for Health Development Studies, Peking University, Beijing, China

<sup>2</sup>Beijing Tongren Eye Center, Beijing Tongren Hospital CMU, Beijing, China

<sup>3</sup>Beijing Institute of Ophthalmology, Beijing, China

<sup>4</sup>The University of Melbourne Faculty of Medicine, Dentistry and Health Sciences, Carlton, Victoria, Australia

<sup>5</sup>China Center for Agricultural Policy, School of Advanced Agricultural Sciences, Peking University, Beijing, China

<sup>6</sup>Center for Experimental Economics in Education (CEEE), Shaanxi Normal University, Xi'an, China

<sup>7</sup>Ophthalmology and Public Health, Queen's University Belfast, Belfast, UK

<sup>8</sup>Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangzhou, China

<sup>9</sup>Freeman Spogli Institute of International Studies, Stanford University, Stanford, California, USA

**Contributors** Concept and design: XM, CJ, NC, SR, NW. Data collection: XM, JH, CJ, YW, YX, CL, YS, ZD. Data analysis: XM, KC. Interpretation of data: XM, JH, CJ, NC. Drafting of the manuscript: XM, JH, CJ, NC. Critical revision of the manuscript for important intellectual content: XM, CL, AH, SR, NC. Supervision: NC, SR, NW. NW is the guarantor of the study. All authors had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

**Funding** This study was funded by Guangming Special Fund of China Health Promotion Foundation, National Natural Science Foundation of China (grant number: 71703002 and 72174009), China Medical Board (grant number: 17-267) and an anonymous donor (Hong Kong).

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Obtained.

**Ethics approval** The protocol of the current project was approved by the ethics committees at Stanford University (SU; FWA00000935), Beijing Tongren Hospital (TREC2006-22) and Peking University (IRB00001052-19017). All study personnel obtained written informed consent from all participants.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available upon reasonable request.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

#### ORCID iDs

Xiaochen Ma <http://orcid.org/0000-0002-8251-3373>

Catherine Jan <http://orcid.org/0000-0001-7383-8208>

Ningli Wang <http://orcid.org/0000-0002-8686-0954>

#### REFERENCES

- Bourne RRA, Stevens GA, White RA, *et al*. Causes of vision loss worldwide, 1990-2010: a systematic analysis. *Lancet Glob Health* 2013;1:e339-49.
- Liang YB, Friedman DS, Wong TY, *et al*. Prevalence and causes of low vision and blindness in a rural Chinese adult population: the Handan eye study. *Ophthalmology* 2008;115:1965-72.
- GBD 2019 Blindness and Vision Impairment Collaborators, Vision Loss Expert Group of the Global Burden of Disease Study. Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of Avoidable blindness in relation to VISION 2020: the right to sight: an analysis for the global burden of disease study. *Lancet Glob Health* 2021;e144-60.
- Asbell PA, Dualan I, Mindel J, *et al*. Age-related cataract. *Lancet* 2005;365:599-609.
- Burton MJ, Ramke J, Marques AP, *et al*. The lancet global health Commission on global eye health: vision beyond 2020. *Lancet Glob Health* 2021;9:e489-551.
- Zhao J, Xu X, Ellwein LB, *et al*. Cataract surgical coverage and visual acuity outcomes in rural China in 2014 and comparisons with the 2006 China nine-province survey. *Am J Ophthalmol* 2018;193:62-70.
- Liu T, Congdon N, Yan X, *et al*. A randomized, controlled trial of an intervention promoting cataract surgery acceptance in rural China: the Guangzhou uptake of surgery trial (GUSTO). *Invest Ophthalmol Vis Sci* 2012;53:5271-8.
- Zhang XJ, Liang YB, Liu YP, *et al*. Implementation of a free cataract surgery program in rural China: a community-based randomized interventional study. *Ophthalmology* 2013;120:260-5.
- Zhang M, Wu X, Li L, *et al*. Understanding barriers to cataract surgery among older persons in rural China through focus groups. *Ophthalmic Epidemiol* 2011;18:179-86.
- Li Z, Song Z, Wu S, *et al*. Outcomes and barriers to uptake of cataract surgery in rural northern China: the Heilongjiang eye study. *Ophthalmic Epidemiol* 2014;21:161-8.
- Zhang XJ, Jhanji V, Leung CK-S, *et al*. Barriers for poor cataract surgery uptake among patients with operable cataract in a





- program of outreach screening and low-cost surgery in rural China. *Ophthalmic Epidemiol* 2014;21:153–60.
- 12 Zhang M, Wu J, Li L, *et al.* Impact of cataract screening outreach in rural China. *Invest Ophthalmol Vis Sci* 2010;51:110–4.
  - 13 Yip WC-M, Hsiao WC, Chen W, *et al.* Early appraisal of China's huge and complex health-care reforms. *Lancet* 2012;379:833–42.
  - 14 Meng Q, Mills A, Wang L, *et al.* What can we learn from China's health system reform. *BMJ* 2019;365:l2349.
  - 15 Yan X, Congdon N, He M. Prevention of cataract blindness in rural China. *Asia Pac J Ophthalmol (Phila)* 2012;1:69–71.
  - 16 O'Donnell O, van Doorslaer E, Wagstaff A, *et al.* *Analyzing Health Equity Using Household Survey Data*. The World Bank, 2007.
  - 17 Liang YB, Friedman DS, Wong TY, *et al.* Rationale, design, methodology, and baseline data of a population-based study in rural China: the Handan eye study. *Ophthalmic Epidemiol* 2009;16:115–27.
  - 18 China Population & Development Research Center. The annual report of Chinese citizen income. 2006. Available: [http://www.cpirc.org.cn/tjsj/tjsj\\_cy\\_detail.asp?id=7938](http://www.cpirc.org.cn/tjsj/tjsj_cy_detail.asp?id=7938)
  - 19 Duan XR, Liang YB, Wang NL, *et al.* Prevalence and associations of cataract in a rural Chinese adult population: the Handan eye study. *Graefes Arch Clin Exp Ophthalmol* 2013;251:203–12.
  - 20 Finger RP, Kupitz DG, Fenwick E, *et al.* The impact of successful cataract surgery on quality of life, household income and social status in South India. *PLoS One* 2012;7:e44268.
  - 21 NAGI SZ. A study in the evaluation of disability and rehabilitation potential: concepts, methods, and procedures. *Am J Public Health Nations Health* 1964;54:1568–79.
  - 22 Radloff LS. The CES-D scale: A self-report depression scale for research in the general population. *Appl Psychol Meas* 1977;1:385–401.
  - 23 Tan L. Increasing the volume of cataract surgery: an experience in rural China. *Community Eye Health* 2006;19:61–3.
  - 24 Yin Q, Hu A, Liang Y, *et al.* A two-site, population-based study of barriers to cataract surgery in rural China. *Invest Ophthalmol Vis Sci* 2009;50:1069–75.
  - 25 Liu T, Ong EL, Yan X, *et al.* Factors influencing the success of rural cataract surgery programs in China: the study of hospital administration and relative productivity (SHARP). *Invest Ophthalmol Vis Sci* 2013;54:266–73.
  - 26 The State Council. Opinions of the state Council on the implementation of the healthy China action. 2019. Available: [http://www.gov.cn/zhengce/content/2019-07/15/content\\_5409492.htm](http://www.gov.cn/zhengce/content/2019-07/15/content_5409492.htm)
  - 27 Hunter BM, Harrison S, Portela A, *et al.* The effects of cash transfers and vouchers on the use and quality of maternity care services: A systematic review. *PLoS One* 2017;12:e0173068.
  - 28 Danquah L, Kuper H, Eusebio C, *et al.* The long term impact of cataract surgery on quality of life, activities and poverty: results from a six year longitudinal study in Bangladesh and the Philippines. *PLoS One* 2014;9:e94140.
  - 29 Polack S, Eusebio C, Mathenge W, *et al.* The impact of cataract surgery on activities and time-use: results from a longitudinal study in Kenya. *PLoS One* 2010;5:e10913.

Appendix Table 1. Sensitivity analysis of multivariate logistic regression model of acceptance of free vision screening among elderly rural dwellers (N=596)

Variables	Odds ratio	(95% CI)	Odds ratio	(95% CI)
<b><i>Patient Characteristics</i></b>				
Age (Years)	0.980	[0.955,1.005]	0.980	[0.955,1.005]
Male Sex (%)	1.477	[0.938,2.325]	1.478	[0.939,2.326]
Illiterate (%)	0.958	[0.626,1.466]	0.959	[0.627,1.466]
Presenting VA (LogMAR <sup>a</sup> ) in Better Eye	0.966	[0.356,2.622]	-	-
Difference Between the Presenting VA (LogMARa) of Two Eyes	0.982	[0.675,1.429]	0.981	[0.674,1.428]
Conducted Surgery Prior to the Project (%)	0.893	[0.521,1.531]	0.983	[0.781,1.237]
Aware of Cataract (%)	1.579	[0.888,2.806]	0.892	[0.521,1.527]
Believe Cataract Can Be Treated Surgically (%)	0.989	[0.658,1.486]	1.578	[0.888,2.806]
Perceived Local Surgeon to be of High or Very High Quality (%)	0.838	[0.571,1.230]	0.989	[0.658,1.487]
Being Engaged in Income Generating Activities <sup>b</sup>	1.225	[0.924,1.625]	0.838	[0.571,1.231]
Self-reported Better Physical Capacity <sup>c</sup>	1.651***	[1.245,2.190]	1.225***	[0.924,1.625]
Self-reported Better Mental Health <sup>d</sup>	0.822	[0.652,1.038]	1.651	[1.245,2.190]
Had Physical Examination Over the Past 12 Months	1.763**	[1.185,2.622]	1.761**	[1.185,2.618]
Received Inpatient Service Over the Past 12 Months	0.791	[0.475,1.318]	0.823	[0.652,1.038]
<b><i>Household Characteristics</i></b>				
Number of Family Members Living Together	1.023	[0.930,1.126]	0.791	[0.475,1.316]
Higher Household Wealth <sup>e</sup>	0.895	[0.684,1.171]	1.023	[0.930,1.126]
			0.895	[0.684,1.171]

Note:

<sup>a</sup> logMAR = logarithm of the minimal angle of resolution. 0.1 change in logMAR indicates 1 line change on the vision chart.

<sup>b</sup> Recoded as a binary variable. 0 = None, 1 = engaged in any of the income generating activities (farming, off-farm employment, both).

<sup>c</sup> Recoded as a binary variable. 0 = lower than average self-reported physical captivity, 1 = higher than average self-reported physical captivity. Questionnaire asked respondents to rate their ability to perform 9 selected physical tasks. Each task had four values: 1=I don't have any difficulty; 2=I have difficulty but can still do it

independently; 3=I have difficulty and need help; 4=I cannot do it. A total value was summed as physical capacity scores.

<sup>d</sup> Recoded as a binary variable. 0 = lower than average self-reported mental health, 1 = higher than average self-reported mental health.

Questionnaire asked about presence or absence of 10 selected mental conditions over the last week. Each condition had four values: 1=Rarely or none of the time (<1day); 2=Some or a little of the time (1-2 days); 3=Occasionally or a moderate amount of the time (3-4 days); 4=Most of the time (5-7 days). A total value was summed as mental health scores.

<sup>e</sup> Recoded as a binary variable. 0 = lower than average household wealth, 1 = higher than average household wealth. Questionnaire asked about ownership of 13 selected items as an index of household wealth.

\* Significant at 0.05.

\*\* Significant at 0.01.

\*\*\* Significant at <0.001.

Appendix Table 2. Sensitivity analysis of multivariate logistic regression model on the determinants of acceptance of free surgery among elderly cataract patients (N=99)

Variables	Odds ratio	(95% CI)	Odds ratio	(95% CI)
<b><i>Patient Characteristics</i></b>				
Age (Years)	0.895	[0.800,1.001]	0.901	[0.807,1.007]
Male Sex (%)	2.117	[0.450,9.958]	2.144	[0.489,9.403]
Illiterate (%)	3.077	[0.698,13.563]	3.186	[0.787,12.897]
Presenting VA (LogMAR <sup>a</sup> ) in Better Eye	0.011*	[0.000,0.517]	-	-
Change in PVA in Better Eye Between 2012 and 2016	4.258	[0.365,49.628]	1.195	[0.137,10.394]
Conducted Surgery Prior to the Project (%)	3.438	[0.586,20.167]	0.959	[0.265,3.476]
Aware of Cataract (%)	4.957	[0.532,46.162]	3.862	[0.470,31.714]
Believe Cataract Can Be Treated Surgically (%)	1.741	[0.258,11.743]	1.880	[0.339,10.421]
Perceived Local Surgeon to be of High or Very High Quality (%)	0.553	[0.133,2.297]	0.731	[0.192,2.787]
Being Engaged in Income Generating Activities <sup>b</sup>	0.57	[0.154,2.104]	0.656	[0.192,2.242]
Self-reported Better Physical Capacity <sup>c</sup>	1.117	[0.469,2.658]	1.155	[0.507,2.631]
Self-reported Better Mental Health <sup>d</sup>	0.681	[0.276,1.681]	0.775	[0.333,1.802]
Had Physical Examination Over the Past 12 Months	0.765	[0.348,1.682]	0.696	[0.328,1.475]
Received Inpatient Service Over the Past 12 Months	0.422	[0.107,1.666]	0.398	[0.107,1.480]
<b><i>Household Characteristics</i></b>				
Number of Family Members Living Together	1.004	[0.778,1.296]	0.979	[0.769,1.246]
Higher Household Wealth <sup>e</sup>	1.291	[0.574,2.901]	1.358	[0.632,2.918]

Note:

<sup>a</sup> logMAR = logarithm of the minimal angle of resolution. 0.1 change in logMAR indicates 1 line change on the vision chart.<sup>b</sup> Recoded as a binary variable. 0 = None, 1 = engaged in any of the income generating activities (farming, off-farm employment, both).



<sup>c</sup> Recoded as a binary variable. 0 = lower than average self-reported physical captivity, 1 = higher than average self-reported physical captivity. Questionnaire asked respondents to rate their ability to perform 9 selected physical tasks. Each task had four values: 1=I don't have any difficulty; 2=I have difficulty but can still do it independently; 3=I have difficulty and need help; 4=I cannot do it. A total value was summed as physical capacity scores.

<sup>d</sup> Recoded as a binary variable. 0 = lower than average self-reported mental health, 1 = higher than average self-reported mental health.

Questionnaire asked about presence or absence of 10 selected mental conditions over the last week. Each condition had four values: 1=Rarely or none of the time (<1day); 2=Some or a little of the time (1-2 days); 3=Occasionally or a moderate amount of the time (3-4 days); 4=Most of the time (5-7 days). A total value was summed as mental health scores.

<sup>e</sup> Recoded as a binary variable. 0 = lower than average household wealth, 1 = higher than average household wealth. Questionnaire asked about ownership of 13 selected items as an index of household wealth.

\* Significant at 0.05.

\*\* Significant at 0.01.

\*\*\* Significant at <0.001.

Appendix Table 3. Sensitivity analysis of multivariate logistic regression model on the determinants of acceptance of free surgery among elderly cataract patients (N=99)

Variables	Odds ratio	(95% CI)	Odds ratio	(95% CI)
<b><i>Patient Characteristics</i></b>				
Age (Years)	0.914	[0.813,1.028]	0.918	[0.816,1.032]
Male Sex (%)	2.915	[0.535,15.876]	2.943	[0.587,14.754]
Illiterate (%)	2.977	[0.664,13.337]	2.834	[0.680,11.809]
Presenting VA (LogMAR <sup>a</sup> ) in Better Eye	0.033	[0.001,1.307]	-	-
Type of Cataract (Lens Opacity Classification System)	0.706	[0.238,2.088]	0.560	[0.190,1.648]
Conducted Surgery Prior to the Project (%)	3.564	[0.290,43.849]	2.936	[0.276,31.262]
Aware of Cataract (%)	1.958	[0.309,12.396]	1.948	[0.346,10.960]
Believe Cataract Can Be Treated Surgically (%)	0.738	[0.167,3.255]	0.829	[0.195,3.516]
Perceived Local Surgeon to be of High or Very High Quality (%)	0.781	[0.199,3.067]	0.753	[0.199,2.857]
Being Engaged in Income Generating Activities <sup>b</sup>	1.245	[0.507,3.054]	1.225	[0.509,2.949]
Self-reported Better Physical Capacity <sup>c</sup>	0.636	[0.243,1.666]	0.703	[0.281,1.757]
Self-reported Better Mental Health <sup>d</sup>	0.857	[0.377,1.949]	0.845	[0.378,1.889]
Had Physical Examination Over the Past 12 Months	0.472	[0.116,1.918]	0.477	[0.122,1.871]
Received Inpatient Service Over the Past 12 Months	0.215	[0.025,1.810]	0.201	[0.026,1.568]
<b><i>Household Characteristics</i></b>				
Number of Family Members Living Together	0.963	[0.742,1.249]	0.956	[0.742,1.232]
Higher Household Wealth <sup>e</sup>	1.296	[0.560,3.002]	1.243	[0.553,2.797]

Note:

<sup>a</sup> logMAR = logarithm of the minimal angle of resolution. 0.1 change in logMAR indicates 1 line change on the vision chart.<sup>b</sup> Recoded as a binary variable. 0 = None, 1 = engaged in any of the income generating activities (farming, off-farm employment, both).

<sup>c</sup> Recoded as a binary variable. 0 = lower than average self-reported physical captivity, 1 = higher than average self-reported physical captivity. Questionnaire asked respondents to rate their ability to perform 9 selected physical tasks. Each task had four values: 1=I don't have any difficulty; 2=I have difficulty but can still do it independently; 3=I have difficulty and need help; 4=I cannot do it. A total value was summed as physical capacity scores.

<sup>d</sup> Recoded as a binary variable. 0 = lower than average self-reported mental health, 1 = higher than average self-reported mental health.

Questionnaire asked about presence or absence of 10 selected mental conditions over the last week. Each condition had four values: 1=Rarely or none of the time (<1day); 2=Some or a little of the time (1-2 days); 3=Occasionally or a moderate amount of the time (3-4 days); 4=Most of the time (5-7 days). A total value was summed as mental health scores.

<sup>e</sup> Recoded as a binary variable. 0 = lower than average household wealth, 1 = higher than average household wealth. Questionnaire asked about ownership of 13 selected items as an index of household wealth.

\* Significant at 0.05.

\*\* Significant at 0.01.

\*\*\* Significant at <0.001.

问卷编码:    同仁编码:     

## 邯郸白内障项目基线农户问卷

### 填表说明:

1. 本表调查对象为 2012 年受访的白内障患者本人、患者的配偶、过去 12 个月同该患者一起居住不少于 3 个月的人。
2. 问卷顺序: 第 10-11 页, 第 8-9 页, 2-7 页, 12-13 页 (认知和抑郁部分一定能要最后问!)
3. 如果受访者超过 1 人, 在“受访者姓名”处填写两个最主要的两个受访对象的姓名和电话。
4. 本表共 13 页, 请检查是否缺页。
5. 答案统一写在答案列。如果答案是数字, 请用阿拉伯数字。
6. 每一项都请准确如实地填写, 不能空。如果是 0, 就填“0”; 对于确实不知道的问题, 就填“999”; 如果题目不适用, 就填“555”。

河北省邯郸市永年县\_\_\_\_\_乡镇\_\_\_\_\_村\_\_\_\_\_组

受访者姓名: \_\_\_\_\_受访者电话号码: \_\_\_\_\_

访谈员姓名: \_\_\_\_\_访谈员编码: \_\_\_\_\_

访谈时间: 2016 年\_10\_月\_\_\_\_日

第 1 查表人: \_\_\_\_\_

第 2 查表人: \_\_\_\_\_

第 3 查表人: \_\_\_\_\_



## A. 家庭基本统计信息

【3类人作为访问对象：包括：1. 2012年受访的白内障患者本人；2. 患者的配偶；3. 过去12个月同该患者一起居住不少于3个月的人。】

个人编码	1 与白内障患者的关系 编码	2 性别 1=男 2=女	3 民族 1=汉族； 2=其他，请说明（ ）	4 年龄 (周岁)	5 是否担任过村干部 1=是 2=否→07题	6 担任过何种村干部 村干部 编码	7 受教育程度 教育程度 编码	8 出生地 1=本村 2=本乡非本村 3=本县非本乡 4=本省非本县 5=外省
101	白内障患者本人							
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								

## B. 家庭成员的教育情况

【个人编码从表 A 抄过来。 本部分仅适用于小于 16 周岁的家庭成员，或者上学的成员。】

个人编码	01 是否上过学 1=是 2=否→03题	02 目前是否还在上学 1=是→05题 2=否	03 不上学最主要的原因 1=身体残障 2=身体不好 3=需要在家做家务 4=需要在家干农活 5=需要在家照顾家里人 6=外出打工 7=年龄太小→下一人 8=其他(请说明)	04 休学时的年龄 (周岁)→07题	05 现在上几年级 教育程度 编码	06 是否住在学校宿舍? 1=是 2=否	07 上学期学习成绩(如果现在没上学,最后的学习成绩)  1=好 2=一般 3=不好

**与白内障患者关系编码：**0=患者本人；1=配偶；2=子女；3=兄弟姐妹；4=孙子女；5=外孙子女；6=女婿儿媳；7=父母；8=其他(请说明)；9=曾孙

**村干部编码：**1=支书；2=副支书；3=村主任；4=副主任；5=文书；6=小组长；7=妇女主任；8=村民代表；9=包/驻村干部；10=其他(请说明)

**教育程度编码：**0=文盲；1=学前班(不包括幼儿园)；2=幼儿园；3=小学一年级；4=小学二年级；5=小学三年级；6=小学四年级；7=小学五年级；8=小学六年级；9=初中一年级；10=初中二年级；11=初中三年级；12=高中一年级；13=高中二年级；14=高中三年级；15=职业高中；16=中专；17=大专；18=大学；19=大学以上；20=没到学前班年龄；21=其他，请说明

## C. 就业基本情况

【本部分仅适用于 16 周岁以上并且不在上学的家庭成员。另：自营工商业包括大规模饲养家禽或家畜等。】

个人 编 码	01	02	03	04	05	06	07	08	09	10	11	12 最主要非种植业工作 → 下转第 13 题
	是否本人回答问题？	2016年是否务农或从事非种植业(包括拿工资的和自营工商业)？	既不务农，也不从事非种植业的原因(答完此题，跳到下一人)	2016年是否务农？	农忙时劳动(不包括非种植业上的劳动)			农闲时劳动(不包括非种植业上的劳动)			2016年是否有非种植业收入(包括拿工资的和自营工商业)	最主要的工作(按照从事时间长短来分)
	1=是 2=否	1=是 → 04 题 2=否	1=年老 2=身体不好、残障 3=待业 4=只做家务 5=退休 6=其它，请说明	1=是 2=否 → 11 题	农忙 共计 有几 周	平均 每周 工作 几天	平均 每天 工作 几小 时	农闲 共计 有几 周	平均 每周 工作 几天	平均 每天 工作 几小 时	1=是 2=否 → 下一人	工作编码

**工作编码：**1=农、林、牧、渔业；2=采矿业；3=建筑业；4=制造业；5=电力、燃气及水的生产和供应业；6=批发与零售业；7=住宿和餐饮业；

8=租赁和商务服务业；9=交通运输、仓储和邮政业；10=信息传输、计算机服务和软件业；11=金融业；12=房地产业；

13=科学研究、技术服务和地质勘查业；14=水利、环境和公共设施管理业；15=居民服务和其他服务业；16=教育；

17=卫生、社会保障和社会福利业；18=文化、体育和娱乐业；19=公共管理与社会组织；20=其他，请说明

## C. 就业基本情况（续）

【本部分仅适用于 16 周岁以上并且不在上学的家庭成员。另：自营工商业包括大规模饲养家禽或家畜等。】

个人编码	13 在2016年的哪些月中做过这项工作？ 工作过的月份填“1”，没有工作的月份填“0”。										14	15	16		17		18	19	20
	1	2	3	4	5	6	7	8	9	10	天	小时	年	月	元	元	元		



#### D. 家务劳动和照顾其他家庭成员的时间

【本部分适用于 A 表出现过的所有的家庭成员。如果被照顾人不是家庭成员，被照顾人编码填“555”，被照顾人与白内障患者的关系填“8=其他（请说明）”，如果自己照顾自己或者不照顾其他人，照顾时间都填“0”，被照顾人编码和与患者的关系划“/”】

个人编码	01		02		03		04		05		06		07		08		09		10		11	
	在家平均每天做家务时间		2016年照顾老人的时间				2016年照顾小孩的时间 (包括喂饭, 接送上下学, 洗衣服, 带小孩, 辅导学习等)				2016年照顾除老人、小孩以外的人员的时间											
	小时		照顾时间		被照顾人	被照顾人	照顾时间		被照顾人	被照顾人	照顾时间		被照顾人	被照顾人	照顾时间		被照顾人	被照顾人与白				
农忙时	非农忙时	共计	平均	平均	编码	与白内障	共计	平均	平均	编码	与白内障	共计	平均	平均	编码	与白内障	共计	平均	平均	编码	与白内障	
		有几	每周	每天		患者的关	有几	每周	每天		患者的关	有几	每周	每天		患者的关	有几	每周	每天		患者的关	
		周	照顾	照顾		系	周	照顾	照顾		系	周	照顾	照顾		系	周	照顾	照顾		系	
			几天	几小				几天	几小				几天	几小				几天	几小			
			时																			

与白内障患者关系编码：0=患者本人；1=配偶；2=子女；3=兄弟姐妹；4=孙子女；5=外孙子女；6=女婿儿媳；7=父母；8=其他(请说明)；9=曾孙

**E. 家庭现有生产工具情况**

【如果没有“其他”生产工具，统一填写“2”】

生产工具	1=有 2=没有	生产工具	1=有 2=没有	其它生产工具	1=有 2=没有
1. 拖拉机		2. 手扶拖拉机		3. 耕牛	
4. 联合收割机		5. 汽车后拖车		6. 母猪	
7. 打谷机或脱粒机		8. 马车		9. 奶牛	
10. 扬场机或风车		11. 船		12. 其它役畜	
13. 耕地机器或器械		14. 机井		15. 三轮车	
16. 家畜饲料加工机		17. 水泵		18. 其它 1（如暖气片，注明）	
19. 米面磨坊、食品加工机		20. 马/驴/骡		21. 其它 2（说明，）	

**F. 家庭现有固定资产情况**

【如果没有“其他”生产工具，统一填写“2”】

资产名称	1=有 2=没有	资产名称	1=有 2=没有	资产名称	1=有 2=没有
1. 电视机		2. 小汽车		3. 手机	
4. 照相机		5. 摩托车或电动车		6. 其他 1（如古董或琴等，注明）	
7. 洗衣机		8. 抽水马桶		9. 其它 2（）	
10. 电脑		11. 修房建材		12. 其它 3（）	
13. 电冰箱或冰柜		14. 太阳能或电热水器		15. 其它 4（）	
16. 煤气或液化气炉具（含抽油烟机）		17. 空调		18. 其它 5（）	

## 【调查员请注意：8—13 页，必须访问白内障患者本人!!!】

## G. 白内障患者的身体功能障碍

下列每组问题中，请选择符合自己情况的选项	选项
1. 您跑或慢跑2里路，有没有困难？	
2. 您走1里（500米）路，有没有困难？	
3. 您走100米，有没有困难？	
4. 您在椅子上坐久了再站起来，有没有困难？	
5. 您一口气上几层楼梯或台阶，有没有困难？	
6. 您弯腰、屈膝或者下蹲，有没有困难？	
7. 您把手臂沿着肩向上伸展，有没有困难？ （两个手都没困难才算没困难，否则算有困难）	
8. 您提 10 斤重的一袋面，有没有困难？（注意是市斤）	
9. 您从桌上拿起一枚一毛钱的硬币，有没有困难？	

## H. 白内障患者的辅助者

下列每组问题中，请选择符合自己情况的选项	选项：	若有困难或无法完成，有人辅助你吗？ 1=有 2=没有→下一题	最主要的辅助者编码
1. 请问您自己穿衣服，有没有困难？（包括从衣橱中拿出衣服，穿上衣服，扣上钮扣，系上腰带。）			
2. 请问您自己洗澡，有没有困难？			
3. 请问您自己吃饭有困难，比如自己夹菜？（定义：当饭菜准备好以后，自己吃饭定义为用餐。）			
4. 您自己起床、下床，有没有困难？			
5. 请问您自己上厕所，有没有困难？（包括蹲下、站起。）			
6. 请问您控制大小便，有没有困难？（自己能够使用导尿管或者尿袋算能够控制自理）			

## I. 白内障患者的卫生服务利用

问题	单位、选项	答案
1. 您最近一次体检（单独检查眼睛除外）什么时候？	1=有，年/月 2=没有	上题为1，请填写 ( )年 ( )月
2. 截止到现在您是否被确诊为以下任何疾病？（可多选）：	1=高血压 2=糖尿病 3=心脏病 4=中风脑出血 5=以上都没有 →6 题	
3. 如果您有被确诊上述疾病，在2016年是否进行过治疗？	1=是 2=否 →5 题	
4. 如果您在2016年进行了治疗，采取治疗的方式是（可多选）： →6 题	1=看医生 2=没有看医生，自己买药 3=先自己买药，后看医生 4=先看医生，后来自己买药 5=其他，请注明	
5. 如果您2016年没有进行治疗，最主要的原因是（单选）：	1=自感病轻 2=经济困难 3=没时间 4=交通不便 5=医院服务差 6=没办法治 7=其他，请注明	
6. 您2016年是否因病住院治疗过？	1=是 2=否 →第J部分	
7. 您在2016年内，住过几次院？	次数	

## J. 白内障病史

问题	选项、单位	回答
1. 您听说过“白内障”没有？	1=有 2=没有	
2. 您有没有白内障？	1=有 2=没有→4题 3=不知道→4题	
3. 您是怎么知道自己有白内障的？ (可多选)	1=西医告诉我的 2=中医告诉我的 3=其他卫生工作人员告诉我的 4=从有关的资料中得知 5=听广播得知 6=看电视看来的 7=家人或朋友告诉我的 8=我能看见自己的白内障 9=其他原因_____	
4. 您觉得白内障能治吗？ (可多选)	1=吃中药能治好 2=吃西药能治好 3=手术能治好 4=不能治 5=不知道 6=其他_____	
5. 您觉得白内障的治疗过程痛苦吗？	1=是的，非常痛苦 2=是的，有点痛苦 3=不是很痛苦 4=一点都不痛苦 5=不知道	
6. 您认识的人当中，有没有得白内障的？	1=有 2=没有→第9题 3=不知道→第9题	
7. 您认识的人当中，有没有得白内障但是被治好的？	1=有，家人或亲朋好友 2=有，但不熟 3=听说有人治好过（不知道是谁） 4=没有 5=不确定	
8. 您认识的做过白内障手术的病人当中，他们的视力跟以前比怎么样？	1=不认识做过白内障手术的病人 2=看得很清楚 3=比手术前看得清楚一些 4=和手术前一样 5=比手术前还糟 6=有些说手术后看得清楚，有些说不清楚 7=不知道	
9. 您觉得做了白内障手术后，视力跟以前比怎么样？	1=比以前清楚 2=比以前清楚一点点 3=和以前一样 4=比以前还差 5=不确定	
10. 您知道什么地方能治白内障吗？	1=知道（请说明，写出这个地方的名字） 2=不知道→17题 3=不确定→17题 4=认为白内障治不好→17题	此题为1请填写： ( )省 ( )市 ( )区、县

问题	选项、单位	回答
11. 在您知道可以做白内障手术的那个地方, 您觉得他们的医生技术怎么样?	1=非常好 2=还可以 3=不太好 4=非常不好 5=不知道	
12. 在您知道可以做白内障手术的那个地方, 您觉得他们的仪器设备怎么样?	1=非常好 2=还可以 3=不太好 4=非常不好 5=不知道	
13. 您所知道的可以做白内障手术的医院/地方, 单程离您家多少公里?	公里 (1 公里=2 里)	
14. 您所知道的可以做白内障手术的医院/地方, 单程离您家有多少小时的路程?	小时	
15. 您所知道的可以做白内障手术的医院/地方, 您平时是怎么去的?(可多选)	1=走路 2=骑自行车 3=骑电动车或摩托车 4=坐小车 5=坐公交车 6=坐火车 7=出租车 8=医院免费接送 9=其他_____ 10=不确定 11=没有去过这家医院	
16. 您所知道的可以做白内障手术的医院/地方所在的城镇, 您之前去过吗?	1=常去 2=去过几次 3=从未去过 4=不确定	
17. 您觉得, 你们这个地区多数眼科医生的技术怎么样?	1=非常好 2=还可以 3=不太好 4=非常不好 5=不知道	
18. 您觉得, 你们这个地区多数眼科医院设备怎么样?	1=非常好 2=还可以 3=不太好 4=非常不好 5=不知道	
19. 您这辈子去过的最远的地方是哪里?	省/市/区县	( ) 省 ( ) 市 ( ) 区、县
20. 您这辈子去过的最远的地方, 离你们村的村委会所在地有多少公里?	1=50 公里以内 2=51-100 公里 3=101-500 公里 4=500 公里以外	

## K. 白内障患者的认知和抑郁情况

## 第一部分:

问题	选项	回答
1. 请告诉我今天的日期,是哪一年哪一月哪一日?(可能回答农历,可多选)	1=年正确 2=月正确 3=日正确 4=年月日全部错误	
2. 请告诉我今天是礼拜几?	1=正确 2=错误	
3. 现在是什么季节(春夏秋冬)?	1=季节正确 2=季节不正确	
4. 您觉得自己现在的记忆力怎么样?  【如果一个都没有背出来,写“999”】	1=极好 2=很好 3=好 4=一般 5=不好	
5. 我现在给您读10个词,您仔细听,我不会重复。一会我在问您我读了什么,您回忆的越多越好,顺序没关系,好吗?		A/B/C/D 哪一组词组: ( )
6. 调查员请记录现在的时间: ___ 时 ___ 分 (24 小时制)		( ) 时 ( ) 分

## 第二部分:

问题	选项及回答
(您上周七天当中,大概有几天有以下的情况:)	1=很少或者根本没有(< 1 天) 2=不太多(1-2 天) 3=有时或者说有一半的时间(3-4 天) 4=大多数的时间(5-7 天)
1. 我因一些小事而烦恼。	
2. 我在做事时很难集中精力。	
3. 我感到情绪低落。	
4. 我觉得做任何事都很费劲。	
5. 我对未来充满希望。	
6. 我感到害怕。	
7. 我的睡眠不好。	
8. 我很愉快。	
9. 我感到孤独。	
10. 我觉得我无法继续我的生活。	



**第三部分：我们将问您一些减法**

问题	回答
11. 100 减去7等于多少? ____	
12. 再减去7 等于多少? ____	
13. 再减去7 等于多少? ____	
14. 再减去7 等于多少? ____	
15. 再减去7 等于多少? ____	
16. 访员请记录：受访者在回答这些算术题时，是否用了纸、笔或其他辅助工具？【选项：1=用了辅助工具；2=没用辅助工具】	
17. 你看到这张图片了吗？请在这张纸上把该图片画出来。 【1=画出了图片； 2=不能画出该图片→19题】	
18. 第17题所画的图形正确吗？【可以多选】 【选项：1=画出了两个五边形； 2=五边形有大有小； 3=两个五边形交叉； 4=以上都没有画对】 (图形的重合大小不算)	
19. 调查员请记录现在的时间：__ 时 __分 (24 小时制)	( ) 时 ( ) 分
20. 刚才我给您读了一些词汇，您也重复了您记得词汇，现在您还能回忆几个词？ 【如果一个都没有背出来，写“999”】	
21. 总体来看，您对自己的生活是否感到满意？ 【选项：1=极其满意； 2=非常满意； 3=比较满意； 4=不太满意； 5=一点也不满意】	