· Original article ·

Adult perceptions of child eye health care in India and the influence of poverty: a pilot study

Sivashanth Gnanasekaran[1], *Grant Blashki*[2], *Lauren Bell*[2]

[1]Melbourne Medical School, University of Melbourne, Melbourne 3010, Australia
[2]Nossal Institute for Global Health, Melbourne 3010, Australia

Correspondence to: Sivashanth Gnanasekaran. 602/97 Flemington Rd, North Melbourne, Victoria 3051, Australia. s. gnanasekaran@ student. unimelb. edu. au

Received: 2014-09-27 Accepted: 2015-02-26

印度成人对于儿童眼保健的认识及贫困因素对其的影响

Sivashanth Gnanasekaran[1], Grant Blashki[2], Lauren Bell[2]
(作者单位:[1]3010 澳大利亚墨尔本,墨尔本大学,墨尔本医学院;[2]3010 澳大利亚墨尔本,诺萨尔全球健康研究所)
通讯作者: Sivashanth Gnanasekaran. s. gnanasekaran@ student. unimelb. edu. au

摘要

目的:探讨印度金奈地区成人对于儿童视力筛查的认识以及贫困因素对其的影响。

方法:此研究采用为期 4wk 的现况研究方法,于 2012-12 在印度金奈市及周边社会经济发展水平较低的地区,随机选取参加拓展营的个体作为研究对象。在接受了免费的视力筛查之后,与他们进行了一个简短的半结构性面谈。每隔两位选取一位受访者在一开始就被问及是否有儿童居住在他们住宅区,回答肯定者则纳入此项研究。

结果:本研究共纳入 120 人,其中 38% (95% CI: 30~47) 的人指出在他们住宅区内至少有一名儿童先前接受过眼部检查(组 1),62% (95% CI: 53~70)的参与者表示无儿童曾经接受过眼科检查(组 2)。采用简单贫困记分卡方法测量两组贫困比分并无统计学差异。

结论:据不到半数的参与者回忆,他们的孩子之前曾接受过眼部检查。在贫困比分上,确认之前曾接受过眼部检查的参与者与没有接受过眼科检查的参与者之间无统计学差异。与孩子从未接受过眼科检查的参与者相比,那些孩子接受过眼部检查的参与者对该检查抱有更积极的态度。研究表明,成人对于孩子接受眼部检查重要性的认识不受贫困程度的影响,提高成人对于儿童接受眼部检查的认识可能需要更多的干预措施而不是扶贫。

关键词:眼部保健;贫困;儿童;印度;认识;保健

引用:Gnanasekaran S, Blashki G, Bell L. 印度成人对于儿童眼保健的认识及贫困因素对其的影响. 国际眼科杂志 2015;15(3):390-395

Abstract

• AIM: To explore adult perceptions of vision screening for children in Chennai, India and the role that poverty may play in this.

• METHODS: This was a four-week cross-sectional study, conducted on randomly selected individuals who attended outreach camps in low socio-economic areas in and around Chennai, India in December 2012. Individuals were approached after they had received their free vision screenings and asked to complete a short face to face semi-structured interview. Every third individual was approached and was initially asked if any children lived in their place of residence. If they responded yes, they were then asked to take part in the study.

• RESULTS: A total of 120 individuals participated in the study. Of these, 38% (95% CI: 30, 47) of the participants indicated that at least one child in their residence had previously had an eye examination (group 1) and 62% (95% CI: 53, 70) of the participants responded that no child in their residence had ever had an eye examination (group 2). The median standardized poverty score, using the Simple Poverty Scorecard for India, was 61 (range 19-80) and 60 (range 21-93) in groups 1 and 2 respectively. There was no statistically significant difference between the poverty scores in the two groups.

• CONCLUSION: We found that less than half of the participants recalled that their children had previously had an eye examination. There was no statistically significant difference in the poverty scores between participants who identified the presence of a previous eye exam and those who did not. Compared to those participants whose children had never had an eye examination, those participants whose children had, were more likely to have a favourable attitude towards a check-up eye examination for their children. This study suggests that adult perceptions of the importance of eye examinations for children do not appear to be influenced by poverty levels. Improving adult perceptions of childhood eye examinations will likely require interventions other than poverty alleviation.

• KEYWORDS: eye care; poverty; children; India; perceptions; health care
DOI:10.3980/j. issn. 1672-5123. 2015. 3. 03

Citation: Gnanasekaran S, Blashki G, Bell L. Adult perceptions of child eye health care in India and the influence of poverty: a pilot study. *Guoji Yanke Zazhi* (*Int Eye Sci*) 2015;15(3):390-395

INTRODUCTION

Childhood blindness is the second biggest cause of blind-person years, after cataract[1,2]. It is estimated that the number of 'blind years' experienced by children almost equals the total number of blind years caused by cataract in adults[1,2]. In addition to this, the majority of childhood blindness exists in the developing world and is preventable or treatable[3-8]. A recent review of available data reports that on average 51% of childhood blindness in developing countries as being avoidable, 27% as being treatable and 19% as being preventable[5]. The Kariapatti Paediatric Eye Evaluation Project (KPEEP) study conducted in southern India showed that up to 43% of the blindness there was potentially avoidable[9]. Corneal scaring due to vitamin A deficiency, measles and traditional medicine use, are the predominant avoidable causes of blindness in many developing countries around the world[1,4,10-12]. In parts of Africa up to 40% of childhood blindness is caused by vitamin A deficiency[5,13-15]. Retinopathy of prematurity (ROP), once considered a disease restricted to developed countries now appears to be most prevalent in low income countries[1,5,10,16]. It is for reasons like these that the World Health Organisation has as part of its Vision 2020 project to eradicate preventable blindness, placed a strong emphasis on the eradication of childhood blindness[1,2]. This will require generating awareness of the problem and educating the community about the importance of vision screening for children. Visiting an optometrist or a doctor and having a vision screening done will be an important first step to identifying any problems that might exist. This initial eye examination will allow for early, effective management.

The majority of available literature on the topic of childhood blindness explores its prevalence, aetiology and wider impact. Few studies have focused on potential barriers to children receivingvision screening in a developing country setting. One study of note, the KPEEP project, conducted focus group discussions with parents and investigated parental awareness and attitudes towards particular eye diseases[17]. This study did not explore the role that potential barriers such as poverty, may have played in adult perceptions of eye care for children. Our study set out to gather information about adult perceptions of the importance of vision screening and eye health care for children. We also intended to find out if poverty, a well-recognised barrier to cataract treatment in India and other developing countries, might also be a barrier for children accessing eye care services[18,19].

All the participants seen during the study period were administered a semi-structured questionnaire after receiving their free vision screening at the outreach camps. Information collected included: basic demographic information, the children's eye history, the adult perceptions of eye care for children and standardised poverty measures.

The study was approved by the University of Melbourne's Human Ethics Research Committee and verbal informed consent was obtained from each of the study participants. The data was analysed with the use of the R studio statistical software[20].

SUBJECTS AND METHODS

This was a four-week cross-sectional study, conducted on randomly selected patients who attended outreach camps in low socio-economic areas in and around Chennai, India in December 2012. The camp locations were coordinated by the Pranav Foundation in association with local microfinance companies. At these camps free vision screenings were conducted and subsidised treatments were provided. The camp was open to individuals of all ages and from all population demographics. Every third individual attending the outreach camp was approached and was initially asked if any children lived in their place of residence. Those who responded 'yes' were invited to participate in the study. Participants were interviewed face-to-face using a short semi-structured questionnaire. The questionnaire comprised questions relating to the child/children's past eye history, participants' perceptions of eye care and possible barriers to children receiving eye health care. A Simple Poverty Scorecard for India, developed by Schreiner was also administered to establish the level of poverty of the participants[21]. A Simple Poverty Scorecard for India targets the dependency ratio, asset ownership, possessions and amenities of surveyed participants. Each indicator corresponds to a point value, and the sum of the indicators generates a score between 0 and 100, which corresponds to a probability of the individual living below the poverty line.

Statistical Methods Our estimates of point prevalence were calculated as the median value of our data. Poverty score is a continuous variable with a non-parametric distribution. We trialled a number of transformations on the poverty score data to normalise the data, but none were appropriate. As such comparisons between the groups with a presence or absence of an eye examination were calculated using the Mann-Whitney *U* test. This test allows us to determine if there is a significant difference, at the 5% level, between the two groups ranked poverty score. Association between categorical demographic variables and the presence or absence of an eye examination was conducted with a χ^2 test.

RESULTS

Table 1 shows the demographics of the study participants. Of the 120 participants, 31.7% were males and 68.3% were females. The majority (59.2%) were mothers and came from households whose primary occupation could be classified into group A, which included labourers, farmers, fishermen and hunters (53.3%). Group B, comprised of tailors, drivers and factory workers (31.7%) and group C (15%) included professionals, administrators and teachers. The study participants had a median poverty score of 60.5 and a range of scores between 19 and 93. The distribution of scores can be seen below (Figure 1). The 38.3% of participants identified the presence of a previous eye examination. We found that the participant's relationship to the child to be a significant factor for the presence or absence of a previous eye exam under the

Table 1 Demographics of study participants

Parameters	*n* (%)
Sex of participants	
M	38 (31.7)
F	82 (68.3)
Relationship to child/children	
Mother	71 (59.2)
Father	38 (31.7)
Other	11 (9.2)
Household's primary occupation[1]	
Group A	64 (53.3)
Group B	38 (31.7)
Group C	18 (15)
No. of children (<18a)	
1	48 (40)
2	56 (46.7)
3+	16 (13.3)

[1]Group A: labourers, farmers, fishermen, hunters; Group B: tailors, drivers, machinery workers, factory staff; Group C: professionals, technicians, clerks, administrators, supervisors, teachers.

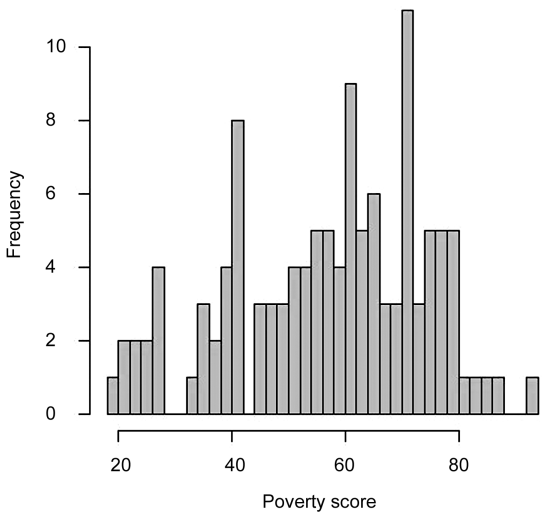

Figure 1 The frequency of Poverty Scores amongst participants who were administered The Simple Poverty Scorecard for India $n=120$, median: 60.5, range 19–93.

Chi-squared test (<0.05). Compared to fathers, mothers were more likely to identify the presence of a previous eye examination for their children. We also found the number of children residing in the household to be a significant factor for the presence or absence of a previous eye examination. Compared to participants whom stated that only one child lived in their residence, participants who stated that 2 or more children lived in their residence, were more likely to identify the presence of a previous eye examination. Participants who identified the presence of a previous eye exam had a median poverty score of 61, while those who identified the absence of a previous eye exam had a median poverty score of 60. A boxplot of the distribution of the Poverty Scores for the two groups can be seen below (Figure 2). The boxplot depicts the five-number summaries, namely the minimum and maximum values, the upper (Q3) and lower (Q1) quartiles and the median,

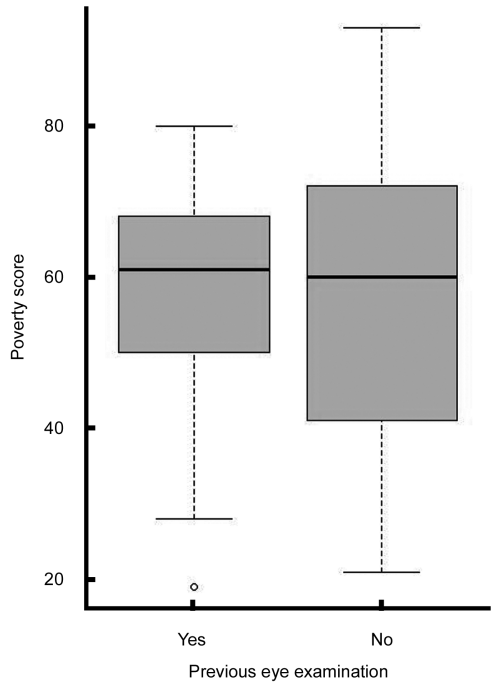

Figure 2 Boxplot of participant poverty scores by presence or absence of previous eye examination This boxplot depicts the five-number summaries, namely the minimum and maximum values, the upper (Q3) and lower (Q1) quartiles and the median, identified by the line inside the box. The length of the box represents the interquartile range (IQR). Values more than 1.5 IQRs but less 3 IQRs from either end of the box are labelled as outliers (o). The poverty score was found to be a non-significant factor for the presence or absence of a previous eye exam ($P>0.05$, Mann-Whitney U test).

identified by the line inside the box. The length of the box represents the interquartile range (IQR). Values more than 1.5 IQRs but less 3 IQRs from either end of the box are labelled as outliers (o). The poverty score was found to be a non-significant factor for the presence or absence of a previous eye exam under the Mann-Whitney U test (Z approximation: −0.081, $P=0.9354$). Despite only 38.3% of participants identifying the presence of a previous eye exam (Table 2), 50% of the participants identified their child would benefit a check up eye examination. Table 3 tabulates the responses from the questions that asked participants if they thought their child would benefit from an eye exam and if so why, against the participants demographics. We found the sex of the participant, the relationship to the child, the number of children in the participant's place of residence and the presence of a previous eye examination to all significantly effect the particpant's attitudes to child eye examination. Participants who identified the benefit of an check up eye examination for their child had a median poverty score of 61.5. Participants who did not identify the benefit of an eye examination for their child had a median poverty score of 60. The poverty score was found to be a non-significant factor for the participants attitude to a child eye examination. A boxplot of the distribution of the Poverty Scores for the two groups can be seen below (Figure 3).

Table 2 Participant demographics, by presence or absence of previous child eye examination *n*(%)

Demographics	Yes, previous eye exam	No, previous eye exam	*P*, Chi-squared test
No.	46 (38.3)	74 (61.7)	
Sex of participant			0.1007
M	10 (26.3)	28 (73.7)	
F	36 (43.9)	46 (56.1)	
Relationship to child			0.0070
Mother	35 (49.3)	36 (50.7)	
Father	10 (26.3)	28 (73.7)	
Other	1 (9.1)	10 (90.9)	
Household's primary occupation			0.5147
Group A	24 (37.5)	40 (62.5)	
Group B	13 (34.2)	25 (65.8)	
Group C	9 (50)	9 (50)	
No. of children (<18a)			0.0327
1	12 (25)	36 (75)	
2	28 (50)	28 (50)	
3+	6 (37.5)	10 (62.5)	

Table 3 Patient demographics by attitudes to child eye examination *n*(%)

Parameters	Yes, would benefit from a check-up	Yes, would benefit because a problem exists currently	No, would not benefit from an eye exam	*P*, Chi-squared test
No.	60 (50)	22 (18.3)	38 (31.7)	
Sex of participant				0.0322
M	16 (42.)	4 (10.5)	18 (47.4)	
F	44 (53.7)	18 (22.0)	20 (24.4)	
Relationship to child				0.0147
Mother	41 (57.7)	16 (22.5)	14 (19.7)	
Father	16 (42.1)	4 (10.5)	18 (47.4)	
Other	3 (27.3)	2 (18.2)	6 (54.5)	
Household's primary occupation				0.2868
Group A	28 (43.8)	12 (18.8)	24 (34.4)	
Group B	19 (50)	8 (21.1)	11 (29.0)	
Group C	13 (72.2)	2 (1.1)	3 (16.7)	
No. of children (<18y)				0.0122
1	21 (43.4)	4 (8.3)	23 (47.9)	
2	32 (57.1)	14 (25.0)	10 (17.9)	
3+	7 (43.8)	4 (25)	5 (31.3)	
Previous eye exam				0.0001
Yes	26	15	5	
No	34	7	33	

DISCUSSION

Our research gives point prevalence estimates of the proportion of adults receiving eye health care who state that one or more of the children in their care have also have received an eye health check (38%). It also provides an estimate of adults receiving eye care who state that children in their care have never received an eye health check (62%).

Our study found the relationship of the interviewee to the child to be a significant factor for the presence or absence of a previous eye examination. Mothers were more likely than fathers and others (aunts, uncles, and grandparents) to identify the presence of a previous eye examination for their children. One explanation for this could be that both fathers and more distant family members have a limited awareness of their children's eyes health care status compared to the children's mothers.

In addition, fewer children in the family were associated with the absence of a previous eye examination. This may be due to the parents of fewer children being less aware of the services available to them or failing to recognise the importance of eye health care for their children.

We also found that despite not reaching statistical significance, a greater proportion of participants from group A (labourers, farmers, fishermen) and group B (factory workers,

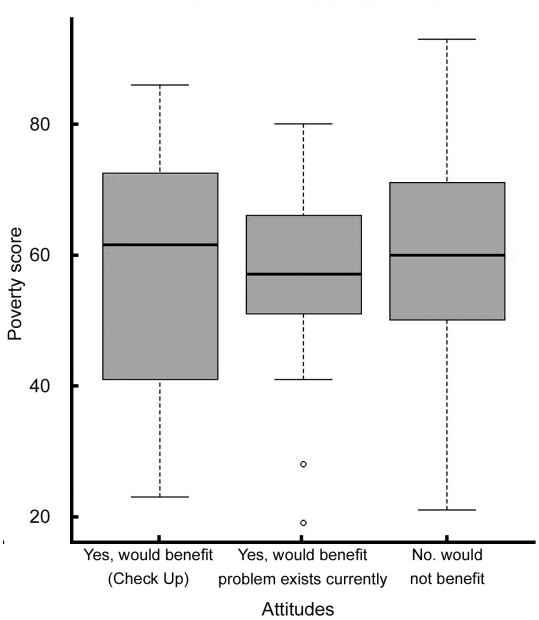

Figure 3 Boxplot of participant poverty scores by attitudes to child eye examination The boxplot depicts the five-number summaries, namely the minimum and maximum values, the upper (Q3) and lower (Q1) quartiles and the median, identified by the line inside the box. The length of the box represents the interquartile range (IQR). Values more than 1.5 IQRs but less 3 IQRs from either end of the box are labelled as outliers (°). The poverty score was found to be a non-significant factor for the participants attitude to a child eye examination (P>0.05, Mann-Whitney U test).

drivers, tailors) indicated that their child had not had a previous eye exam compared to group C (professionals, technicians, clerks, administrators, supervisors, teachers) participants.

In relation to the participant's attitude to child eye examination, the participant's gender, relationship to the child and number of children in the household were all found to be statistically significant factors. Female participants were more likely to identify a benefit associated with a check-up exam for their children than male participants. This trend was also reflected in the fact that mothers were more likely than fathers to identify that their children would benefit from a check-up examination. Less children in the family was also associated with participants being less likely to value eye checks for their children. The participants who identified a benefit existed from an eye exam, were analysed separately according to their reasoning behind identifying a benefit. This better allowed us to compare the participants that identified the benefit of a check-up eye examination against those that did not. It was noted the majority (86.8%) of participants who did not identify the benefit of a check-up eye examination for their child also indicated the absence of a previous eye examination for their child. In other words, the presence of a previous eye examination seems to be associated with more positive participant attitudes to child eye examination.

Our paper has a number of limitations. We recognise that the sample obtained from the survey cannot be used to draw inferences for the general population of Chennai, India. Our results are a reflection of the population that attend the clinic. Also, with respect to poverty, there may be a difference between this population and the population that does not attend the clinic.

Another limitation of our study was our relatively small sample size of 120 participants. With 95% confidence, our sample size of 120 would be able to detect a difference in the poverty score of 9 poverty units or above between the two populations, participants whom have at least one child in their care who has previously received an eye health check (group 1) and participants who have one or more children in their care who have not previously received eye health checks (group 2), with 80% power. As the poverty score is so similar between our two groups (61 and 60 respectfully) however, we would have required a sample of over 1000 participants to detect a difference. It is more likely that there may be no difference in poverty score between the two groups.

It should be noted that the Simple Poverty Scorecard for India, developed by Schreiner was used to assess the poverty level of a participant is only an estimation and has some limitations[21]. Figure 1 shows a wide distribution of scores amongst study participants and hence we argue that it is applicable to the community of Chennai and population attending the outreach camps. Future studies could however, adopt more rigorous tools for assessing a participant's poverty level.

Inconclusion, we found that less than half of the participants recalled that their children had previously had an eye examination. Compared to those participants whose children had never had an eye examination, those participants whose children had, were more likely to have a favourable attitude towards a check-up eye examination for their children. This study suggests that adult perceptions of the importance of eye examinations for children do not appear to be influenced by poverty levels. Improving adult perceptions of childhood eye examinations will likely require interventions other than poverty alleviation.

ACKNOWLEDGEMENTS

This study would not have been possible without the assistance of Dr. T Senthil, his team at the Pranav Foundation and Unite For Sight.

REFERENCES

1 Gilbert C, Foster A. Childhood blindness in the context of VISION 2020-the right to sight. *Bull World Health Organ* 2001;79(3):227-232

2 World Health Organization. Global Initiative for the Elimination of Avoidable Blindness: action plan 2006-2011. 2007

3 Xiao B, Fan J, Deng Y, Ding Y, Muhit M, Kuper H. Using key informant method to assess the prevalence and causes of childhood blindness in Xiu'shui County, Jiangxi Province, Southeast China. *Ophthalmic Epidemiol* 2011;18(1):30-35

4 Limburg H, Gilbert C, Hondo N, Dung NC, Hoang TH. Prevalence and causes of blindness in children in Vietnam. *Ophthalmology* 2012;119(2):355-361

5 Kong L, Fry M, Al-Samarraie M, Gilbert C, Steinkuller PG. An update on progress and the changing epidemiology of causes of childhood blindness worldwide. *J AAPOS* 2012;16(6):501-507

6 Nallasamy S, Anninger WV, Quinn GE, Kroener B, Zetola NM, Nkomazana O. Survey of childhood blindness and visual impairment in Botswana. *Br J Ophthalmol* 2011;95(10):1365-1370

7 Bandrakalli P, Ganekal S, Jhanji V, Liang YB, Dorairaj S. Prevalence and causes of monocular childhood blindness in a rural population in southern India. *J Pediatr Ophthalmol Strabismus*. 2012;49(5):303-307

8 Demissie BS, Solomon AW. Magnitude and causes of childhood blindness and severe visual impairment in Sekoru District, Southwest Ethiopia: a survey using the key informant method. *Trans R Soc Trop Med Hyg* 2011;105(9): 507-511

9 Nirmalan PK, Vijayalakshmi P, Sheeladevi S, Kothari MB, Sundaresan K, Rahmathullah L. The Kariapatti pediatric eye evaluation project: baseline ophthalmic data of children aged 15 years or younger in Southern India. *Am J Ophthalmol* 2003;136(4):703-709

10 Gilbert C. Changing challenges in the control of blindness in children. *Eye (Lond)* 2007;21(10):1338-1343

11 Semba RD, Bloem MW. Measles blindness. *Surv Ophthalmol* 2004;49(2):243-255

12 Rahi J, Sripathi S, Gilbert CE, Foster A. Childhood blindness due to vitamin A deficiency in India: regional variations. *Arch Dis Child* 1995;72(4):330-333

13 Cetin E, Yaman A, Berk AT. Etiology of childhood blindness in Izmir, Turkey. *Eur J Ophthalmol* 2004;14(6):531-537

14 Kello AB, Gilbert C. Causes of severe visual impairment and blindness in children in schools for the blind in Ethiopia. *Br J Ophthalmol* 2003;87(5):526-530

15 Gilbert CE, Wood M, Waddel K, Foster A. Causes of childhood blindnessin east Africa: results in 491 pupils attending 17 schools for the blind in Malawi, Kenya and Uganda. *Ophthalmic Epidemiol* 1995;2(2):77-84

16 Phan MH, Nquyen PN, Reynolds JD. Incidence and severity of retinopathy of prematurity in Vietnam, a developing middle-income country. *J Pediatr Ophthalmol Strabismus* 2003;40(4):208-212

17 Nirmalan PK, Sheeladevi S, Tamilselvi V, Victor AC, Vijayalakshmi P, Rahmathullah L. Perceptions of eye diseases and eye care needs of children among parents in rural south India: the Kariapatti Pediatric Eye Evaluation Project (KEEP). *Indian J Ophthalmol* 2004;52(2):163-167

18 Finger RP. Cataracts in India: current situation, access, and barriers to services over time. *Ophthalmic Epidemiol* 2007;14(3):112-118

19 Kuper H, Polack S, Eusebio C, Mathenge W, Wadud Z, Foster A. A case-control study to assess the relationship between poverty and visual impairment from cataract in Kenya, the Philippines, and Bangladesh. *PLoS Med* 2008;5(12):e244

20 Team RC. R: A language and environment forstatistical computing. 2012

21 Schreiner M. A simple poverty scorecard for India. Microfinance risk management Center for social development, Washington University in Saint Louis, USA 2008