The Cataract Impact Study: Six Year Follow Up

Summary Report

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Executive Summary

In 2005-2006 the Cataract Impact Study was undertaken to explore the impact of cataract surgery on poverty, activities and health related quality of life in Kenya, Bangladesh and the Philippines. People visually impaired from cataract (cases) and age and gender matched controls were identified through population based surveys and interviewed about poverty, activities and quality of life. Cases were offered cataract surgery and one year later were re-traced and re-interviewed.

This study found that at baseline compared to controls without visual impairment, cases with cataract:

- were poorer in terms of assets, self-rated wealth and monthly expenditure
- were less likely to engage in and spent less time on productive activities and were more likely to have assistance with daily activities
- had poorer vision related and generic health related quality of life

One year after cataract surgery this study found that compared to baseline:

- there was increase in per capita expenditure of households with people who had undergone cataract surgery
- people who undergone cataract surgery were more likely to undertake and spent more time on productive activities and were less likely to report assistance with activities
- vision-related and generic health-related quality of life of cases had improved among people who had undergone cataract surgery

This study highlighted some key benefits of cataract surgery to a population of older adults in low-income countries after one year. However, it is unclear whether these benefits are sustained over time. Therefore in the current study, a six year follow up of the cataract impact study was undertaken in Bangladesh and the Philippines to explore the long term impact of cataract surgery on poverty, activities and health related quality of life.

This study found that six years after cataract surgery:

- There was a sustained increase in per capita expenditure of households with operated cases

- There was an increase in asset ownership among households with operated cases compared to baseline
- The proportion of cases who took part in productive activities was higher and the proportion who received assistance with activities was lower compared to before cataract surgery
- There was a sustained improvement in vision related and health related quality of life among
- After six years cases and controls were similar in terms of economic measures, activities and vision related and health related quality of life

Conclusion

In summary, this six year follow up of the cataract impact study has indicated sustained long term benefits of cataract surgery to a population of older adults in low-income countries in terms of household economics, health related quality of life and activities.

INTRODUCTION

Age related cataract remains the leading cause of blindness worldwide. The fundamental aim of cataract surgery is improving the quality of the daily lives of people affected. However, relatively little is known about the extent to which this occurs in the long term in low income settings.

The 'Cataract Impact Study' was a longitudinal intervention study undertaken to explore the impact of cataract surgery on household poverty, daily activities and health related quality of life among adults aged ≥50 years in three low-income countries: Kenya, the Philippines and Bangladesh. In this study, people with visual impairment from cataract ('cases') and age-gender- matched peers without visual impairment from cataract ('controls') were indentified through population based surveys [1-3] and interviewed about household poverty indicators, their daily activities and their health related quality of life using standardised questionnaires. All cases were offered free or subsidized surgery. Approximately one year later all cases and controls were re-traced and re-interviewed and outcome measures were compared between baseline and follow up.

This study found that at baseline compared to controls without visual impairment, people with cataract:

- had poorer vision related and generic health related quality of life [4-6]
- were less likely to engage in and spent less time on productive activities and were more likely to have assistance with daily activities [7]
- were poorer in terms of assets, self-rated wealth and monthly expenditure[8]

One year after cataract surgery this study found that compared to baseline:

- the vision-related and generic health-related quality of life of people who had undergone cataract surgery had improved [9]
- people who had undergone cataract surgery were more likely to undertake and spent more time on productive activities and were less likely to report assistance with activities[10]
- the per capita expenditure of households with people who had undergone cataract surgery had increased[11]

The cataract impact study highlighted some key benefits of cataract surgery to a population of older adults in low-income countries after one year. However, it is unclear whether these benefits are sustained over time. Few studies have explored the long term impact of cataract surgery on quality of life outcomes [12, 13] and no information on long-term impact on time-use or poverty indicators could be identified. Three different indicators of poverty were included in the Cataract Impact Study: household expenditure, asset ownership and self-rated wealth. While increases in household expenditure were observed among operated cases at one year follow up, asset ownership and self-rated wealth remained largely unchanged. This is unsurprising since they are longer term measures of poverty; more time is needed for households to accumulate additional assets or for perceptions of wealth to change. A longer follow-up is therefore necessary to explore the full impact of cataract surgery on poverty.

During the baseline survey all people identified with cataract visual impairment <6/24 in the better eye were referred for surgery. In Bangladesh both the surgery and transport to the hospital was provided free of charge. In the Philippines surgery was subsidised or free for those unable to pay and travel costs were reimbursed. Despite this, nearly half of those referred for surgery did not attend. The reasons for this were not well understood. Reasons for non-acceptance of surgery are likely to be complex and therefore in-depth qualitative interviews are needed to fully explore this.

AIMS AND OBJECTIVES

Aim: to assess the long term (six year) impact of cataract surgery on poverty, daily activities and health related quality of life among adults aged ≥50 years in Bangladesh and the Philippines and explore reasons for non-attendance for cataract surgery.

Objectives

- To assess the long term impact of cataract surgery on:
  - household expenditure, asset ownership and self-rated wealth
  - vision related quality of life and generic health related quality of life
  - engagement in and time allocated to productive activities, leisure activities and inactivity and assistance with activities.
- To explore reasons for non-attendance to cataract surgery.

METHODS

Study setting

The study was undertaken in one region of Bangladesh (Satkhira) and two areas of the Philippines (Negros Island and San Jose, Panay Island). The six year follow up did not include Kenya because of the lower study numbers enrolled in the original study.

Study population

Cases and controls were identified primarily through population-based blindness surveys (Rapid Assessment of Avoidable Blindness) which included >3600 people aged ≥50 years in each setting.[1-3] Cases were people aged ≥50 years with pinhole corrected visual acuity (VA) <6/24 in the better eye due to cataract, diagnosed by testing VA with a tumbling E chart and assessing the presence of cataract through ophthalmic examination. Due to logistical and time constraints, additional cases were identified in each setting through community-based case detection using the same cluster sampling procedure, examination and case definition as above. For every case identified we also randomly selected an age and gender matched control subject without visual impairment. Controls were included to enable baseline comparisons of people with and without visual impairment from cataract and to assess for any temporal changes in the general study population in terms of poverty, time-use and HRQoL between baseline and follow up.

Visual acuity measurement in Bangladesh

Baseline, one year and six year follow up surveys

Baseline surveys were conducted between Jan 2005-May 2006. All cases were counselled and offered surgery at one hospital in the study district following standard procedures for that hospital. Free surgery was offered to participants in Bangladesh and transport was provided by the hospital to collect and return the patients. In the Philippines a fee was requested but those who could not afford the fee were offered free surgery. Patients made their own travel arrangements, but were reimbursed travel costs.

Cases and controls were then retraced and re-interviewed one year (2006-2007) and six years later (2011) using addresses and GPS coordinates recorded at baseline. The follow up surveys were conducted during the same climatic season as the baseline.

Interviews

All participants underwent interviews in their own homes. Interviews were conducted by trained interviewers and were regularly observed by supervisors. The interviews comprised the following:

1. Poverty

Poverty was assessed using three different measures:

- Household per capita expenditure: It is difficult to collect data on income in surveys in low income countries where a lot of work undertaken is farming for home consumption of food. We therefore measured household per capita expenditure as a proxy for income, and this was assessed using methods developed for the World Bank's Living Standards Measurement Survey.[14] The person responsible for finances in the household was interviewed to assess household consumption during the previous month of goods produced through home-production, bought, or received as gifts or payment. Items were included on food, education, household expenses and personal expenses and rent. In total 79-90 items were included per country. Table 1 provides an example of some of the items included. The value of these items was summed and divided by the number of household members to calculate household monthly per capita expenditure.

- Assets: data were collected on standard indicators of socio-economic-status including number and type of different assets (e.g. cattle, furniture, electrical goods) and household

characteristics (e.g. building materials of the floor, roof and walls; type of toilet and number of rooms). These data were used to develop a socio-economic index score for each participant.

- Self-rated wealth: the household informant was asked to rank their household's wealth relative to other households in the community on a scale from 1 (poorest) to 10 (wealthiest).

Table 1: Example of consumption data collected in Bangladesh

	Was [..] eaten by this household in the past month?		What was the value of [..] eaten from purchases in the past month?	What was the value of [..] eaten from *own production* in the past month?	What was the value of [..] eaten received as gifts in the past month?	What was the value of [..] eaten received as payment in the past month?
Food Item	0= No	1= Yes	Shillings	Shillings	Shillings	Shillings
Rice	0	1				
Beans	0	1				
Fresh Fish	0	1				
Canned foods (fish, fruit)	0	1				
Soft drinks	0	1				

2. Activities and time-use

Data were collected using the 'stylised activity list' developed for the World Bank's Living Standards Measurement Survey.[15] Cases and controls were asked whether they had been involved in each of a preset list of common daily activities during the last week and if they had, whether they had been involved in the activity yesterday. Those who had been involved in an activity 'yesterday' were asked to estimate how much time they had spent on the activity and whether they received any assistance from another person in performing that activity. Table 2 lists these activities and how they were grouped for analysis. Interviewers checked that total time reported was 22-26 hours and if not, went through the list again with the respondent. This method provided three different types of data:

- Participation: whether or not participants had undertaken each activity during the previous week
- Time: the amount of time spent on different activities during the previous day

- Assistance**:** whether or not participants had assistance with activities during the previous week

Interview in Bangladesh

Table 2: Time-use data: activities included in the questionnaire and how they were grouped for analysis**.**

Specific activities included	Activity group	
Sleep, bathing, dressing, eating, other	Personal	
Cooking/washing dishes, cleaning house/clothes, shopping, looking after children/elderly/sick, other	Household/family	**Productive activities***
Agriculture, animal rearing, fetching firewood/water, processing agricultural products/food, other	Paid work	
Agriculture, animal rearing, fetching firewood/water, processing agricultural products/food, other	Work for own use	
Social visits, attending ceremonies, attending meetings	Leisure outside home	
Reading/listening to radio/watching TV; chatting, relaxing with friends/family; prayer (Bangladesh), other	Leisure inside home	
Time spent alone and not engaged in any activity at all	No activity	

*NB Household/family activities, paid work and work for own us were all defined as productive activities

3. Quality of life

Two different instruments were used to assess aspects of health related QoL

- Vision-related quality of life**:** This was measured using WHO/PBD VF20, a new vision specific instrument proposed by the WHO as a cross cultural tool for assessing VRQoL in low-income settings.[16] This instrument consists of 20* questions divided into three sub-scales:
    - overall eyesight rating (1 question)
    - general functioning (14 questions) e.g. “because of your eyesight how much difficulty do you have going down steps or stairs?”; response options: none/mild/moderate/severe/extreme or cannot do
    - psychosocial (4 questions) e.g. “ Because of your eyesight how often have you felt that you are a burden on others?” response options: Never/rarely/sometimes/often/very often

  (NB: one item on ocular pain and discomfort was removed due to lack of relevance to this study population, resulting in a 19 item instrument)

- Generic health related quality of life: This was measured through EuroQol, an instrument developed by a network of European researchers to assess generic HRQoL and can be applied regardless of the medical condition being evaluated.[17] It includes two components. The first consists of five domains: mobility, self care, usual activity, pain/discomfort and anxiety/depression. Respondents are asked to rate each of these as either having no problem, some problem or extreme problem. The second measures self-rated health by asking participants to rate their ‘health today’ on a scale ranging from 0 (‘worst imaginable health state’) to 100 (‘best imaginable health state’).

Survey teams

Each survey team consisted of an ophthalmologist and two interviewers who underwent a week of training. In the Philippines the interviewers at the six-year follow up were the same staff who undertook the baseline and one-year follow up surveys. In Bangladesh, interviewers from the original study were unavailable and therefore new interviewers were recruited. The in-country project coordinators were the same at each of the three study time points. The qualitative interviewers (two in Philippines, one in Bangladesh) were trained for one week.

Qualitative data

In-depth interviews were undertaken to explore in more detail a) the long term impact of cataract surgery on people's daily lives and b) factors affecting the decision to uptake/refuse surgery. We explored these areas from both perspective of the individual (operated or unoperated case) and their family members. Qualitative data were collected from 133 individuals. Participants were purposively selected with consideration to age and gender. The sample included:

- Bangladesh
    - 12 operated cases, each with one family member
    - 13 unoperated cases, each with one family member
- Philippines
    - 18 operated cases, each with one family member
    - 24 unoperated cases, each with one family member

Participants were interviewed by a trained interviewer in the local language using a topic guide. Interviews lasted approximately 30 - 45 minutes and were audio-recorded.

Qualitative interviews in the Philippines and Bangladesh

Analysis

We compared baseline, one and six year follow up outcomes of operated cases in terms of poverty indicators, health-related quality of life and time-use. We also assessed change in these outcome measures among the controls as an indicator of secular trends. Analyses were restricted to participants who were included at each of the three time points. One and six year

expenditure data were adjusted for cumulative inflation rates so they were comparable to baseline and all expenditure data were converted into US dollars.

Qualitative interviews were transcribed verbatim into the local language and then translated into English. Data were analysed through inductive thematic analysis and interviews were analysed manually and using NVivo 9 software. Transcripts were read repeatedly and coded into the key themes identified.

RESULTS

Study population

The baseline survey included 217 cases visually impaired from cataract and 280 controls without visual impairment in Bangladesh and 238 cases and 163 controls in the Philippines. Uptake of cataract surgery was generally low: 54% (n=117) of cases identified at baseline attended for surgery ('operated cases') in Bangladesh and 47% (n=112) in the Philippines.

Response rates at one year were at least 80% (Bangladesh: 85% operated cases and 80% controls, Philippines: 88% operated cases and 86% controls). At the six year follow up the response rates were: 48% (n=56) for operated cases and 51% (n=142) for controls in Bangladesh and 45% (n=51), 56% (n=91) in the Philippines. Of those who were lost to follow up at six years, the majority had died (Bangladesh: 62% cases, 56% controls, the Philippines: 75% cases and 47% of controls) and the remainder could not be found.

People who were included at six years were generally similar to those who were lost to follow up in terms of their baseline socio-demographic characteristics (age, gender, marital status, education, literacy) and visual acuity. The exceptions were that cases lost to follow up in Bangladesh and controls in both settings were slightly younger than those who were traced at six years (Bangladesh: cases 72 years vs 69 years, p=0.04, controls 69 years vs 67 years, p=0.02; Philippines controls 72 years vs 68 years, p=0.007). In the Philippines loss to follow up rates were slightly higher among male cases (67%) than females (46%, p=0.03).

Poverty

Per capita expenditure (PCE) (figure 1):

- At baseline cases had significantly lower PCE compared to controls (Philippines $22 vs $29, p=0.04, Bangladesh $15 vs $27 p=0.02).
- One year after surgery PCE among operated cases increased so that there were no longer significant differences between cases and controls (Philippines $27 vs $28, Bangladesh $23 vs $21).
- This increase was sustained so that PCE remained similar among cases and controls at the six year follow up (Philippines $39 vs $37, Bangladesh $23 vs $24).

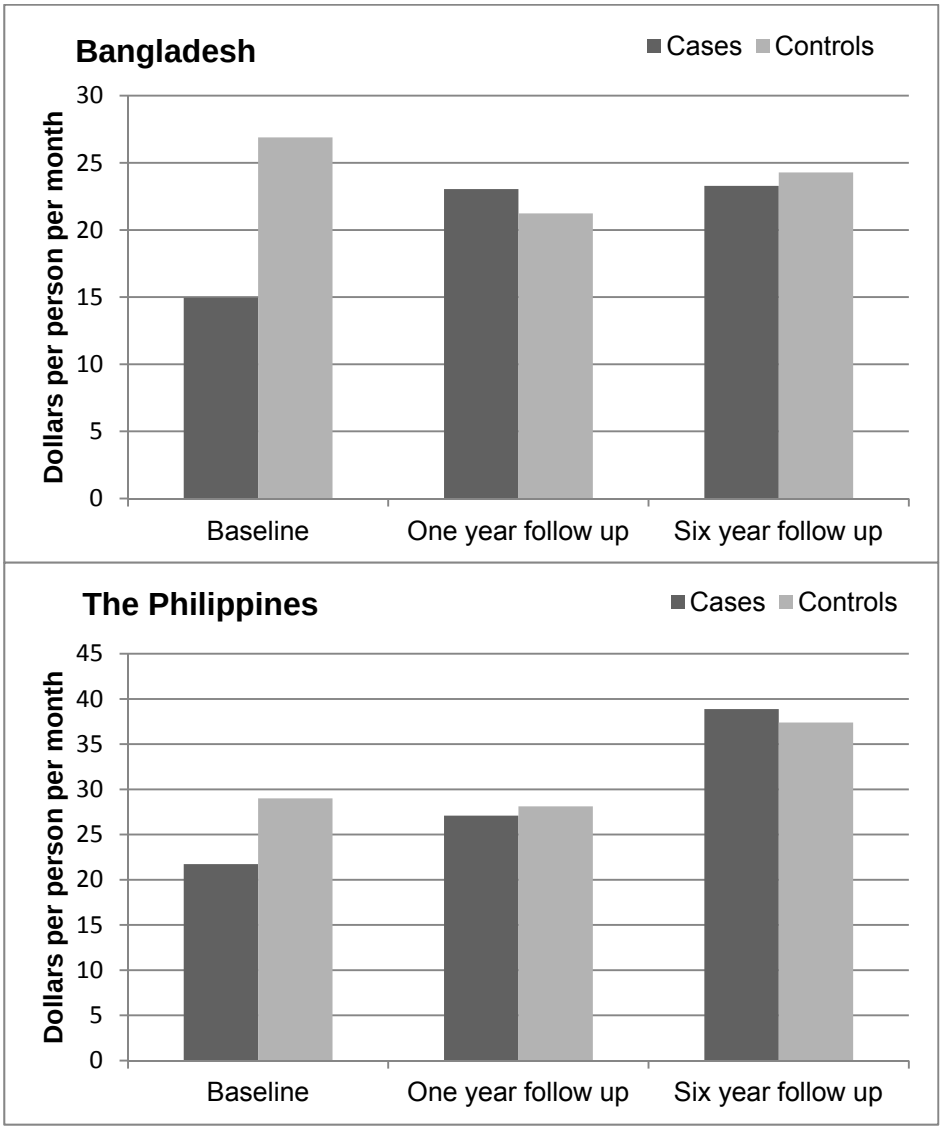

Figure 1: Mean monthly per capita expenditure (US Dollars) among cases and controls

Assets (figure 2):

- At baseline operated cases had significantly lower asset scores compared to controls although this different was of borderline significance in Bangladesh (-0.50 vs 0.33 p=0.06) and not significant in the Philippines (Philippines -0.25 vs 0.32,p=0.20)). These scores remained similar at the one year follow up.
- At the six year follow up, assets scores among operated cases increased in both settings (Philippines: from -0.25 to 0.13, Bangladesh from -0.50 to 0.1) and this change was statistically significant in Bangladesh (p=0.005).

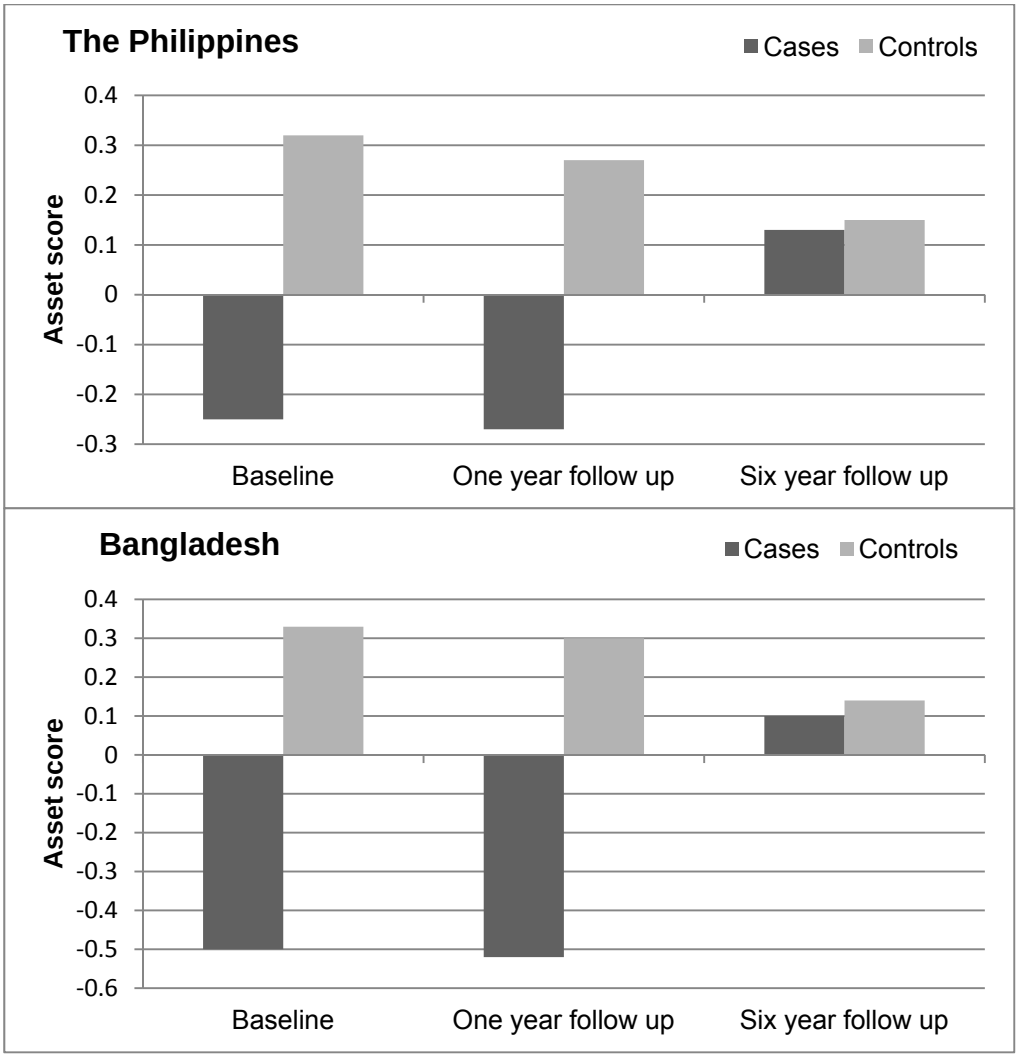

Figure 2: Asset ownership scores among cases and controls

Self-rated wealth:

- At baseline self-rated wealth was significantly lower among operated cases (3.7) compared to controls (4.5, p=0.01), while in the Philippines scores were similar for operated cases (4.7) and controls (4.6). Self-rated wealth had not changed at the one year follow up.
- At the six year follow up there was a small increase in self-rated wealth among operated cases so that in Bangladesh there was no longer any difference between operated cases (4.1) and controls (4.1). Self-rated wealth in Philippines remained similar over the 3 time points.

Activities

Participation in productive activities (figure 3):

- At baseline cases were less likely to take part in productive activities compared to controls (Bangladesh: 61% cases vs 79% controls, Philippines: 80% cases vs 97% controls, p=<0.001).
- At the one and six year follow up the proportion of operated cases engaged in productive activities significantly increased compared to baseline in both settings (p=<0.02). There were no significant differences in this variable between cases and controls at either of the follow ups.

Time spent on productive activities

- At baseline cases spent at least two hours less time on productive activities compared to controls (p<0.002).
- At the one year follow up the average amount of time spent on productive activities increased significantly by more than one hour among cases (p<0.01).
- At the six year follow up the mean time spent on productive activities reduced among both cases and controls compared to one year (p<0.01).

Assistance received with daily activities (figure 4)

- At baseline cases were 2.5 and 6.5 times more likely to receive assistance with undertaking activities compared to controls in Philippines and Bangladesh respectively (p<0.01).

- At the one year and six year follow ups there was significant decrease in the proportion of cases reporting assistance by at least a half in both settings ($p<0.01$).

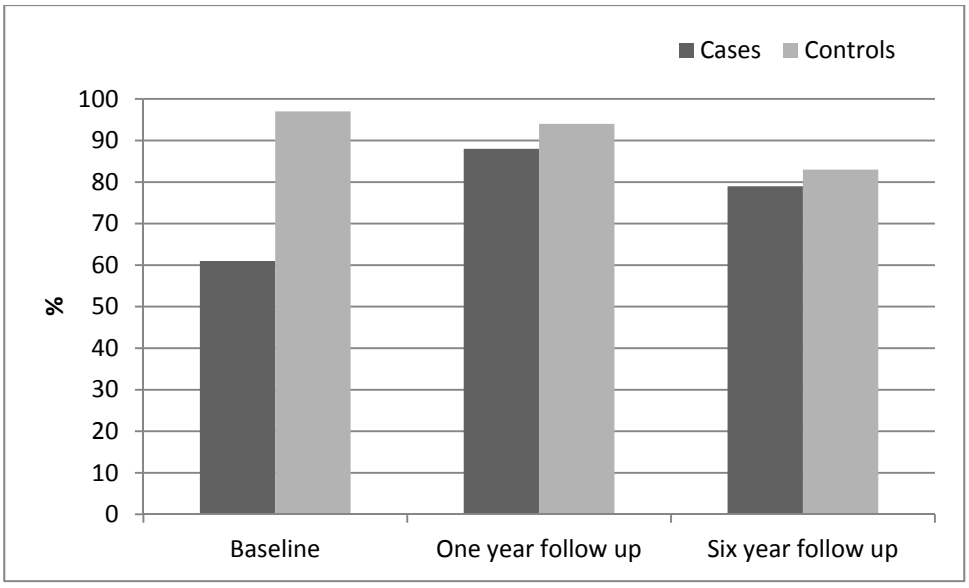

Figure 3: Proportion of cases and controls who participated in productive activities in Bangladesh (a similar pattern was observed in the Philippines)

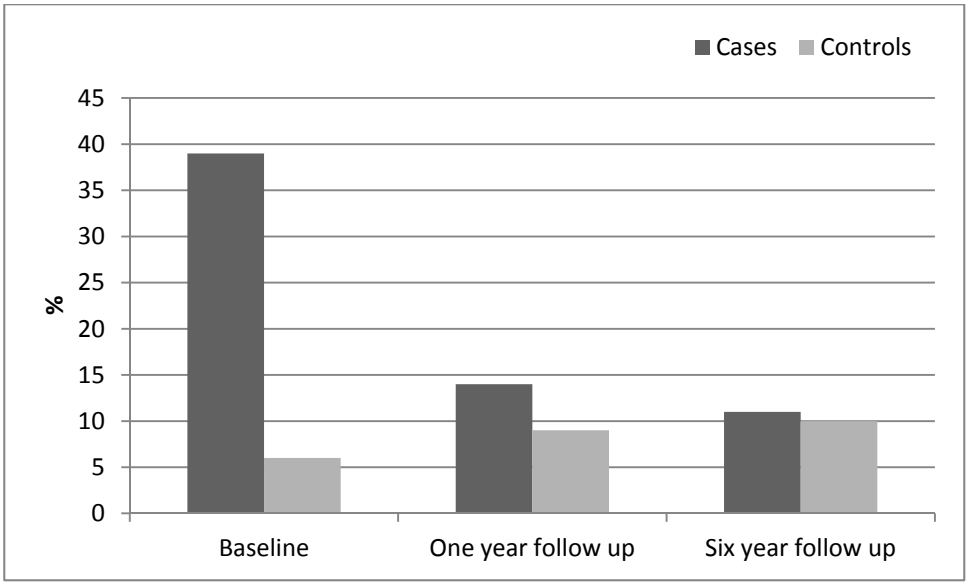

Figure 4: Proportion of cases and controls who received assistance with activities in Bangladesh (a similar pattern was observed in the Philippines)

Quality of life

Vision related quality of life (Figure 5):

- At baseline cases had significantly poorer overall eyesight, general functioning and psychosocial scores compared to controls ($p<0.001$). In the Philippines, for example the mean general functioning score was 27.1 for cases and 88.3 for controls. Similarly large differences were observed in Bangladesh.
- At one year follow up among operated cases, mean scores in each VRQoL sub-scale increased substantially up to the levels of the controls ($p<0.001$). For example, in Bangladesh mean general functioning scores increased from 16.8 to 82.0.
- Six years after cataract surgery VRQoL scores among operated cases remained substantially higher compared to baseline ($p<0.001$) and there were no significant differences in VRQoL scores between cases and controls at this time point.

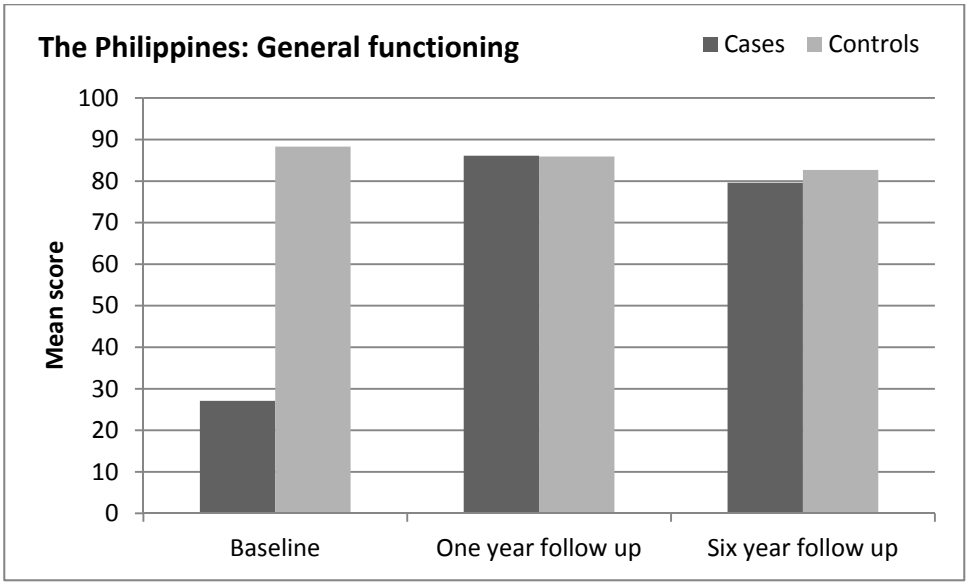

Figure 5: Mean general functioning scores among cases and controls in the Philippines (similar responses were observed for each vision related quality of life domain in both settings)

Generic health related quality of life (EQ-5D) (Table 3)

- At baseline, cases were significantly more likely to report problems in self-care, mobility, usual activities and anxiety/depression in both settings ($p<0.03$)
- At the one year follow up the proportion of cases reporting problems reduced significantly ($p<0.05$) by at least 20% in 4 of the 5 domains in the Philippines and 3 of the 5 domains in Bangladesh compared to baseline.
- These reductions in reported problems among cases remained six years later.

Table 3: The proportion of cases and controls who reported some problem with each EQ-5D domain

	The Philippines		Bangladesh	
EQ-5D Domain	**Operated Cases**	**Controls**	**Operated Cases**	**Controls**
Mobility				
Baseline	82%	57%	88%	43%
One year follow up	59%	52%	34%	44%
Six year follow up	55%	46%	44%	36%
Self care				
Baseline	57%	10%	66%	18%
One year follow up	31%	23%	26%	23%
Six year follow up	41%	34%	**27%**	**27%**
Daily activities				
Baseline	76%	29%	89%	42%
One year follow up	45%	29%	43%	37%
Six year follow up	55%	41%	42%	33%
Pain/discomfort				
Baseline	96%	65%	79%	85%
One year follow up	75%	71%	78%	82%
Six year follow up	75%	65%	**89%**	86%
Anxiety/depression				
Baseline	71%	52%	91%	78%
One year follow up	61%	41%	86%	89%
Six year follow up	37%	44%	91%	91%

Self-rated health:

- At baseline cases had significantly poorer self-rated health scores compared to controls (Philippines: cases 53.9 vs controls 63.1 p=0.001; Bangladesh 51.8 vs 59.7p =0.02).
- Self-rated health among operated cases increased at the one year follow up (Philippines 57.9; Bangladesh 70.0) compared to baseline so that they were no longer significantly different to controls.
- The increase in self-rated health was sustained after six years in Philippines (59.2). In Bangladesh scores decreased among both operated cases (55.7) and controls (50.7) between one and six years, but scores for cases remained significantly higher compared to baseline and were not different to those of the controls.

Qualitative interviews: Factors influencing the decision to attend for surgery

A substantial proportion of people identified as needing cataract surgery at baseline did not undergo surgery. We interviewed a sample of these participants and their household members about the reasons for not having surgery and the main identified themes were as follows:

Fear of surgery

Fear of surgery was identified as major factor for not undergoing surgery. Un-operated individuals and their family members commonly reported being fearful of surgery and the possible risks associated with having surgery.

> "I thought what if I invite any problem by doing the operation? What if I die? I was a bit afraid" Female, Bangladesh
>
> "She did not have the courage .... That was the only reason. My mum is old so she cannot move alone....She said her time is coming so we should not get any risk for her" Household member, Bangladesh

Fear of surgical outcome

Fear of the outcome of cataract surgery was also reported. This included fear that the outcome of surgery would be poor or would cause further problems and complication to the affected eye. This was particularly the case when individuals known to the un-operated cases had undergone surgery that had not been successful.

> "True, it was free...but I have nervousness....and the eye of my relative was ruined...and I have seen the eye, it is ruined" Female, Philippines
>
> " my elder brother's wife's eyes got damaged, she can't see well" Female, Bangladesh

Age

Age also influenced decision making. Both individuals and their family members expressed their belief that the individual was too old for surgery, too old to gain benefit from surgery or had deteriorating health due to old age. While others felt that cataract was a natural part of the ageing process.

> "I would not go. At this age, if I go for the surgery and my eye become worse, then what will I do?" Male. Bangladesh

Cost (Indirect costs)

Indirect costs associated with travelling to the hospital for either the individual or an escort accompanying them and cost of food the hospital were all mentioned as reasons for not attending surgery.

> "I also frankly told you that we are financially struggling, I think that is really the main reason because even if the operation is free you can't really say that you won't have to pay for anything because you will really have expenses" Household members, Female, 28 years, The Philippines

Lack of an someone to accompany

Lack of an escort during the time of surgery was commonly reported as a reason for not attending surgery. In Bangladesh, the lack of an escort and having never travelled outside of the local area were important issues for elderly females.

> " the other problem is I have no one to give me support, guide me while I'm there." Female, The Philippines

Family influence/beliefs

Another common theme was the important role of family in decision making regarding attendance for surgery. In some cases the decision was taken solely by the family. Household financial reasons were reported, for example the need to for a family member to take time out of employment in order to escort the visually impaired person for surgery. In Bangladesh, the role and position of elderly women within the household as perceived by the family appeared to be an important factor for elderly women not attending for surgery.

Other themes identified:

- Lack of knowledge regarding cataract and cataract surgery
- Difficulty with travel to hospital (e.g. ill health, fearful to travel)
- Time commitments: due to working/family commitments
- Fatalism/Spiritual beliefs: the belief that condition (cataract) was the destiny/fate of the individual or due to particular events that occurred during the individual's life.

DISCUSSION

The original Cataract Impact Study found that at baseline, people with bilateral vision impairment from cataract were poorer, were less likely to undertake productive activities and had substantially poorer health related quality of life compared to people with normal vision. The simple low-cost intervention (cataract surgery) then accorded improvements in the household economy, increased engagement in productive activities and improved quality of life. The current study has found that these improvements were sustained six years later, providing evidence of the long term benefits of cataract surgery.

This study used three different poverty measures: per capita expenditure, asset ownership and self-rated wealth. One year after cataract surgery household per capita expenditure increased in both settings so that cases were no longer poorer than controls and this increase remained six years later. In contrast no change was observed in asset ownership at the one year follow up among operated cases, but after six years asset ownership increased indicating a continued and long term beneficial effect of cataract surgery on household poverty. This finding would be expected as asset ownership is a longer term measure of poverty than expenditure: more time is needed for households to accumulate possessions. Improvements in self-rated wealth were not consistently observed. However, this may be because as it is a measure of perceived wealth relative to other households in the community which might be harder to change.

Participation in productive activities among operated cases was higher at both the one year and six year follow up compared to the baseline and this provides a possible route by which the economic gains may have occurred. In addition, reported assistance from others with daily activities was lower at both follow ups compared to before surgery and this may also contribute to a household economic impact. For both cases and controls between the one and six year follow up we observed some reduction in engagement in and amount of time spent on productive activities and an increase in assistance with activities. This is not surprising in a population of older adults (approximately half of participants were aged 70 years and above in both settings) where health may be deteriorating over time.

This six year follow up study also found evidence of sustained long term benefits of cataract surgery on aspects of quality of life. Six years after surgery, there were substantial

improvements in perceptions of overall eyesight, reduced difficulty undertaking everyday activities (general functioning) and reduced frequency of negative psychosocial experiences associated with vision. As well as vision specific quality of life, we found that there were long term improvements perception of health, with operated cases less likely to report problems with mobility, self-care, usual activities (both settings) and anxiety/depression (Philippines only). Before surgery, cases had significantly poorer self-rated health compared to controls, but at the six year follow up there were no differences between cases and controls. There was some reduction in quality of life measures between the one and six year follow up among both cases and controls, which again may be expected in this age group.

Barriers to cataract surgery

The main themes identified as barriers to the uptake of cataract surgery included fear of the surgical procedure and outcomes, old age, lack of an escort to accompany the person to attend surgery, beliefs about the cause of cataract, lack of financial means to support the individual e.g. food and associated costs when accompanying for surgery. The interviews also highlighted an important role of the family in influencing decisions about surgery. These findings highlight the multifactoral and complex nature of decision making regarding uptake of surgery and strategies are needed to address these identified barriers in each setting

Limitations of the study/potential bias

Uptake of surgery was relatively low (around 50%) and loss to follow up at six years was high (around 50%) in both settings. To explore the potential impact of these factors on our findings we compared the baseline socio-demographic characteristics of a)cases who did and did not attend for surgery and b)participants who were included and lost to follow up. We found that participants were similar in these characteristics limiting the likelihood of bias. The exception was that cases who did not attend for surgery in both settings and those lost to follow up in Bangladesh were slightly older than those included. It is therefore possible that had more cases attended surgery and if fewer cases were lost to follow up, the increases in PCE and productive activities may have been smaller.

Conclusion

The six year follow up of the Cataract Impact Study has indicated that among older adults in low-income countries there are sustained benefits of cataract surgery in terms of health

related quality of life, household economics and daily activities. These findings highlight the importance of providing affordable and accessible cataract surgery in these settings.

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