

FINAL REPORT

Integrated Model of Care for Diabetic Retinopathy within the Health System of Bangladesh



Submitted to:



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Submitted by:



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The Fred Hollows Foundation

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Block-C, Niketan, Gulshan-1,
Dhaka 1212, Bangladesh

Subject: Draft Report of “Integrated model of care for diabetic retinopathy within the health system of Bangladesh” Project.

Dear Sir/Madam,

Please find the final draft report (attached) on End Term Evaluation of “Integrated Model of Care for Diabetic Retinopathy within the Health System of Bangladesh Project”. We are thankful to you and your great team for all the support given to us; otherwise it won't have been possible to complete this very important study.

Please feel free to contact us if you have any query.

We look forward to hearing from you soon.

Yours sincerely,



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Acronyms

BBS	Bangladesh Bureau of Statistics
DAB	Diabetes Association of Bangladesh
DM	Diabetes Mellitus
DR	Diabetic Retinopathy
FGD	Focus Group Discussion
FHF	Fred Hollows Foundations
FI	Field Investigators
FS	Field Supervisors
HH	Household
IDI	In-depth Interview
IDF	International Diabetes Federation
IEC	Information, Education and Communication
INGO	International Non-governmental Organization
KII	Key Informant Interviews
KAP	Knowledge, Attitude and Practice
M&E	Monitoring and Evaluation
MIS	Management and Information system
NCD	Non Communicable Diseases
OPD	Out Patient Department
QC	Quality Controller
RFP	Request for Proposal
SBMCH	Sher-e-Bangla Medical College & Hospital
ToC	Theory of Change
ToR	Terms of References
UHC	Upazilla Health Complexes
VEGF	Vascular Endothelial Growth Factor

EXECUTIVE SUMMARY

'Integrated Model of Care for Diabetic Retinopathy Within the Health System of Bangladesh' - a project implemented by The Fred Hollows Foundation, seeks to support the development and assessment of an integrated and comprehensive model of care for people at risk of vision loss due to diabetes-related eye disease in 4 districts in Bangladesh. The overall goal of the project is to avoid blindness in people at risk of vision loss due to diabetes, by strengthening the health system.

The project ran for 3 years, from July 2015 until June 2018, with an additional project period added until December 2018 to conduct final project report and evaluation.

This end line evaluation was commissioned by Foundation's Bangladesh office. The purpose of this evaluation was to determine the extent to which the project's intended outcomes were met, and to test the theory of change (ToC) of this project. The findings from this evaluation will be used to assist in the development of continued DR (Diabetic Retinopathy) programming and advocacy strategies in Barisal Division from 2019 onwards.

The survey was conducted following both the qualitative and quantitative methods. Under the quantitative method, sample survey was carried out and in-depth interviews were conducted under the qualitative method. The target respondent of the sample survey was the beneficiaries. The sample size of this survey was 200. On the other hand, in-depth interviews were carried out among project officials, doctors (12) and relevant stakeholders (8) and Focus Group Discussions with the beneficiaries (8).

The survey data show that all the beneficiaries are now aware about diabetes, have knowledge of harmful effects of uncontrolled diabetes and DR. The beneficiaries seemed to have received adequate knowledge on DR from the hospital - DAB center and district hospital(97%), media (48.5%) and courtyard sessions (48.5%) they had attended. These encouraged them for regular screening and to visit DAB center for eye check-up. They could correctly recall the suggested lifestyle they need to follow if DR was detected.

FINDINGS

The findings also show that because of the sensitization, the rate of screening has increased significantly. Also, overall 48% of the female patients visited the DAB/districts hospital for eye treatment/screening. Except in Barisal district, the beneficiaries of other three districts mostly visited DAB as compared to district hospitals. In Brahmanbaria, the beneficiaries visit Kawtoli diabetic center (79.2%) for diabetes check-up. In addition, around 58% of the respondents reported that they are aware about places other than DAB center that provides treatment of eye problem/DR problem.

The beneficiaries expected adequate doctors (80%), better treatment facility (80%) and free treatment (15%) from the hospitals. Most of the respondents (85%) are willing to pay for seeking any eye care services from hospital and on average, they amount they prefer to pay is BDT 100.00 for

one visit. Also, 94.8% of the respondents will recommend their family member, neighbors and friends to get their eyes examined to prevent DR at early stage.

However, the drop-out of patients referred from the DAB center to tertiary hospitals are still high among the females. Female patient could not visit DAB or district hospital due to long distance (70%) and lack of companion (45%).

If we consider the gender perspective, in most of the cases, the spouse of female (67%) decides where she you may go for diabetes treatment.

One of the main objectives of the project was to establish a functional referral system. The project has set up a strong horizontal referral system between the Diabetic Association of Bangladesh (DAB) and the Sher-e-Bangla Medical College and Hospital in Barisal. Through effective advocacy meetings, referral cards and communication campaign that have continued in all project locations, the project could successfully establish this system. The project efforts resulted to develop awareness among the registered DAB patients and hence, patient flow in the tertiary hospitals gradually increased.

Similarly, vertical referral system between the district eye units and Sher-e-Bangla Hospital has also been established. Innovative client card developed for patients from district and sub district hospitals and robust communication activities have resulted to an increased clients' flow up to its optimum at tertiary, secondary and primary levels.

Based on the project data from July2017 to November2018, 75% of the referred patients took treatment in the district hospitals. However, the sample survey shows that 67% of the patients were referred to district hospitals, 72% of these patients being from urban and 55% from rural. Around, 77% of these referred patients claimed to have continued their treatment in the district hospitals. This distribution was found to be similar among gender, urban/rural and district.

The project has strong aligned with the national health/eye health strategies. Also, the project aligns with national diabetes and blindness prevention plans and treatment plans of service provider partners. The project objectives (generate evidence, increase awareness, development and implementation of a comprehensive and integrated model of care diabetes within the health system of Barishal Division and Brahmanbaria District etc.) and implementation process (health workforce training, formative research, awareness raising program etc.) corroborate the above-mentioned claim.

Based on the above findings and secondary data, it can be said that the awareness of importance of DR and eye treatment seem increased universally. The referral system seems work in the intended way. The patients had high level of satisfaction on the services received. According to them, behavior was good of the health care providers and the clinical care and time what they received from them was quite well. Therefore, it can be said that the project is successful to meet up different pre-defined objectives that has been set for execution and the project adopted model can be replicated nationwide.

RECOMMENDATIONS

- Integration of eye care into diabetes facilities, and integration of DR into eye care units of the public sector facilities, has proved to be successful.
- Screening, management and treatment of DR may be integrated into diabetes facilities for registered persons with diabetes.

- Disseminating information and increasing community knowledge about diabetes and its consequences create community demand for the utilization of DR services in these facilities.
- Especially, women with diabetes and DR get proper access to DR management services, if such services are available at district level healthcare facilities.
- Treatment of DR maybe introduced into the diabetes centers/ DAB's, as these facilities have registered patients and have their data (e.g. their case and family history).
- If given proper training, MLOPs/AOPs would be capable of diagnosing DR among patients with diabetes, through Low-Resolution Fundus Camera.
- Low-Resolution Fundus Cameras is capable of detecting DR; however, it has its limitations (the stage or the severity of DR mostly cannot be detected by Low-Resolution Fundus Cameras). However, a study conducted by ICDDR,B has concluded that it is a more cost-effective equipment compared to High Resolution Fundus Camera, especially for resource poor settings.
- The pilot study could be scaled up at all medical colleges and hospitals, nationwide.

CHAPTER 1

INTRODUCTION

In any country lacking a cohesive healthcare delivery system, a high burden of illness threatens sustainable development. In Bangladesh, diabetes is a particularly daunting challenge, with more than 12% of the adult population affected by diabetes or prediabetes. Nearly half of the population with diabetes is undiagnosed. Among those with diabetes, only 1 in 3 people is treated, and roughly 1 in 13 achieves treatment targets (1). As we know diabetes is one the major causes of various diseases, including blindness. Among various eye diseases **Diabetic Retinopathy (DR)** is quite common in Bangladesh. People with diabetes can have an eye disease called Diabetic Retinopathy (DR). This is when high blood sugar levels cause damage to blood vessels in the retina. These blood vessels can swell and leak. Or they can close, stopping blood from passing through. Sometimes abnormal new blood vessels grow on the retina. All of these changes can steal vision of the affected patient. The estimated number of people with DR in Bangladesh is 1.54 million (27% persons with diabetes).*(Picture from website; Stages of DR; Griswold Home Care)*



Diabetic retinopathy remains the leading vascular-associated cause of blindness throughout the world. Its treatment requires a multidisciplinary interventional approach at both systemic and local levels. Current management includes laser photocoagulation, intravitreal steroids, and anti-vascular endothelial growth factor (VEGF) treatment along with systemic blood sugar control. Diabetic retinopathy (DR), a well-known consequence of long-standing and poorly controlled diabetes mellitus (DM), causes significant vision loss and blindness in the human population. DR currently affects approximately 150 million people worldwide, and the World Health Organization projects that the number of people affected will double by the year 2025 (2). In patients with DM, the prevalence of any form of diabetic retinopathy is approximately 24% (3).

With a growing number of diabetic patients, especially among the poorer segments (where women are more neglected), government along with different organizations came forward to combat the situation. The Fred Hollows Foundation is one the leading INGOs working in Bangladesh. This end line study focuses on evaluating the impact of the intervention took by FHF and ResInt Bangladesh carried out the end line survey.

About Fred Hollows Foundation

Based in Australia, The Fred Hollows Foundation (The Foundation) was founded in 1992 by eminent eye surgeon Professor Fred Hollows. The organization is widely well-acquainted for its secular characteristic and contribution in non-profit public health domain. In this domain, the Foundation focuses on strengthening eye health systems and the treatment and prevention of avoidable blindness caused by Cataract, Trachoma, Diabetic Retinopathy (DR), and Refractive Error. The Foundation operates in



more than 20 countries across Australia, The Pacific, South and South East Asia, and Africa. The Foundation was named The Australian Charity of the year 2013 in the inaugural Australian Charity Awards.

The foundation has been working in Bangladesh since 2008 and from the inception, helping Bangladesh Government of Bangladesh in eye health sector to support implementation of the National Eye Care Plan. In addition, the foundation works closely with different health facilities including hospitals in the public and private sectors to reduce avoidable blindness. Thus, the strength of the foundation lies in the fact that they have been working with the government and almost every international and local organization (private) that focus on DR in Bangladesh.

1.1 PROJECT BACKGROUND

In Bangladesh, approximately 6.1% of the population aged 20-79 years has diabetes, with approximately 46% of these undiagnosed. There are approximately 5.7 million people with diabetes in Bangladesh and this number is expected to double by 2030. People with diabetes can have an eye disease called **Diabetic Retinopathy (DR)**. This is when high blood sugar levels cause damage to blood vessels in the retina. These blood vessels can swell and leak. Or they can close, stopping blood from passing through. Sometimes abnormal new blood vessels grow on the retina. All of these changes can steal vision of the affected patient. The estimated number of people with DR in Bangladesh is 1.54 million (27% persons with diabetes).

However, comparing with the prevalent high rates of diagnosed and undiagnosed diabetes in Bangladesh, limited evidences are there on the current knowledge, attitudes and practices of people and health care workers, towards diabetes mellitus and DR. Moreover, it has been seen that eye care services are currently not available, accessible or affordable for people at risk of vision loss due to diabetes, or integrated into routine care at the sub-district, district or divisional level in most of the cases. Against this backdrop, the FHF (Fred Hollows Foundation) had decided to implement a project title 'Integrated model of care for diabetic retinopathy within the health system of Bangladesh' in four districts of Barisal division.

The project goal was: **Avoid Blindness** in people at risk of vision loss due to diabetes, by strengthening the health system. The project activities were designed to:

- Raise awareness and early identification of diabetes at the community level
- Support the integration of eye health components into existing services which care for people with diabetes at the primary, secondary and tertiary levels

It was expected that the project would be able:

- **To improve awareness of DM and DR at the community level through awareness raising and risk assessments-** It is anticipated that this will facilitate earlier identification of DM, and will create demand generation for DM care, and regular screening for DR.
- **To integrate eye care (including an annual eye exam) into routine care for people with diabetes at the primary health care level (Upazilla Health Complexes – UHC), through the Diabetes Association of Bangladesh (DAB) centers at the district level, and at**

district hospitals - It is anticipated that this will facilitate early identification of people with vision threatening DR, and referral for treatment as required.

- **To make DR diagnostic and treatment services available within Barisal Division, so people do not need to attend Dhaka for routine care** - It is anticipated this will facilitate improved access to treatment, and therefore minimize risk of vision loss due to DR.

To achieve the aforementioned theories of change, the project adopted the following approaches to implement its activities:

- Formative research
- Awareness raising activities
- Health workforce training
- Support the development of eye care services within existing health facilities
- Develop effective referral pathways and co-ordination mechanisms
- Rigorously assess the effectiveness of the approaches applied.

Besides, the project also included several operational research components that have contributed to the evidence base for prevention of vision loss due to diabetes, the results of which were expected to inform stakeholders at different levels to collaboratively advocate for future replication and scale-up of the project.

The project was implemented for 3 years, from July 2015 until June 2018, with an additional project period added until December 2018 to conduct final project report and evaluation.

1.2 OBJECTIVES OF THE STUDY

It is understood from the RFP that the objective of the study is twofold:

- **To determine the extent to which the project's intended outcomes were met**
- **To test the theory of change of this project.**

1.3 RATIONALE OF THE STUDY

The end line survey is an integral part for any projects. When baseline surveys provide information on pre-project condition, end line surveys offer to determine the effect of the intervention of a project. It also refers to the process of determining the worth or significance of an activity policy or program. It provides information that enables the incorporation of lessons learned into the decision-making process of both recipients and donors. The end line survey is an evaluation survey in nature. In general, an evaluation assessment was conducted by collecting data following both quantitative and qualitative methods considering five factors: Relevance, Efficiency, Effectiveness, Impact and Sustainability. These include some formative research and end-of-project research on knowledge, attitudes and practices, as well as operational research on the effectiveness of various formats of screening for diabetes and DR, and assessment of the impact of the DR model of care proposed in the project. It gives an impression that the survey would focus on answering sustainability issues which in turn inform the foundation on the prospect of new project development in Barisal division and beyond for DR programming. The key evaluation questions have already been described in the RFP. The answers of these questions were found from primary sources coupled with analysis of relevant secondary information, the survey would be able to produce '**future focused**' output which would direct the foundation to replicate the project activities in future however, after modifying project activities as required.

CHAPTER 2

METHODOLOGY & APPROACH

2.1 METHODOLOGICAL APPROACH

Evaluation Method

A cross-sectional study was used a mixed method of FGD, interviews, observation, document and records review, in participation of the project personnel, and beneficiaries.

Evaluation questions and data collection Technique

Question/Information	Source of information	Technique
Program progress		
To what extent have the community awareness and training elements of this project influenced demand for diabetes and eye health services, and resulted in regular screening and earlier diagnosis and treatment of DR?	Program personnel, project ToC, M&E documents, MIS data,	In-depth Interview, Document review
Program implementation		
Does the information given at the community level to registered patients with known diabetes (DAB members) encourage them to go directly to the tertiary hospital, or to have initial screening at DAB center?	Program personnel, beneficiaries (patients who have diabetics)	In-depth Interview, FGD, face-to-face interview, <i>comparing with baseline data (will be provided by FHF)</i>
How effective were the awareness generation activities in terms of increasing knowledge and changing attitudes?	Program personnel, health workers, beneficiaries (patients who have diabetics)	In-depth Interview, FGD, face-to-face interview
How has this project influenced referral patterns for diabetes and DR amongst the various services involved in this project? To what extent are these referral patterns effective, efficient and sustainable? <i>(Compare and assess the horizontal and vertical referral pathways that have been established by the project)</i>	Program personnel, health workers, beneficiaries (patients who have diabetics)	In-depth Interview, FGD, face-to-face interview <i>comparing with baseline data (will be provided by FHF)</i>
Beneficiary perceptions		
To what extent did this project enable the various groups of the target population (including women and marginalized groups) to access diabetes and DR services, compared to before the project started?	Program personnel, health workers, beneficiaries (patients who have diabetics)	FGD, In-depth Interview

<p>Who is still not accessing these services, and why not?</p>		<p><i>Comparing with baseline data (will be provided by FHF)</i></p>
<p>Compare the gender equity between district level and tertiary level DR treatment and management</p> <p>Is the cost of screening within the affordable price for known diabetes? Determine the accessibility and gender sensitivity of available eye care services.</p> <p>Make a comparative analysis of drop-out of patients referred from district hospitals and DAB center to tertiary hospitals.</p> <p>What are the barriers in the uptake of DR treatment and management with regards to gender equity?</p>	<p>Program personnel, health workers, beneficiaries (patients who have diabetics)</p>	<p>Interview, Document review, MIS data, In-depth Interview, FGD, face-to-face interview</p>
<p>Lessons learned and recommendations</p>		
<p>To what extent has this project provided enough evidence to contribute to the National DR Strategy and Action Plan and to inform models of DR care across Bangladesh?</p> <ul style="list-style-type: none"> ○ <i>Has the 3 years implementation of this project provided enough evidence to develop the National DR Strategy and Action Plan?</i> ○ <i>Is there enough evidence generated from this project that can be used for advocacy at the divisional and national level to inform scale up of models of care for DR across Bangladesh?</i> 	<p>Program personnel, Project beneficiaries, and M&E documents, External stakeholders</p>	<p>In-depth Interview, FGD, Document review</p>
<p>What elements of this project should be adopted in future DR programming?</p> <ul style="list-style-type: none"> ○ Is this model of care effective to manage DR treatment, whether at tertiary/district/DAB center? ○ Where is the most appropriate facility for DR management and treatment for most people? 	<p>Program personnel, beneficiaries, Project and M&E documents, External stakeholders</p>	<p>Document review, In-depth Interview,</p>

2.2 TARGET RESPONDENTS

Respondents/Participants

- Beneficiaries/ Existing clients who have received services from the programme (aged 20 -79 years who have suffered from Diabetics)
- Service providers/health care providers i.e. ophthalmologists, hospital managers, clinical staff from the available eye care facilities in programme areas
- Program personnel (FHF and other partners)
- Relevant stakeholders of the project i.e. local government representative (Chairman of union, upazila), community leaders etc.
- **Case study** – observation of such treatment etc.
- In addition, we will review all related documents (also if there is a **baseline reports, ToC, MIS data** etc. to understand how the program is approaching).

2.3 STUDY LOCATION

As per the ToR, the project has been implementing in 4 districts in Barisal division (i.e. Barisal, Jhalokhathi, Patuakhali and Brahmanbaria). A comprehensive approach of data collection to supplement and complement each other to arrive at a substantive finding triangulated from various sources in all the four districts.

2.4 STUDY DESIGN

The evaluation design was based on two procedures namely documents review and onsite data collection. Below are the descriptions of the both:

Documents Review (secondary information)

Reviewing of the existing relevant documents was one of the most integral components of this study. At the beginning of the study; secondary information, existing publication, existing baseline data, reports (MIS reports and half yearly reports) and formats were used as source of information. Moreover, review of all relevant project reports/documents such as baseline and half-yearly reports and any other survey documents were performed.

On Site Data Collection (Face-to-face and observation)

The onsite data collection was held to triangulate the in-depth information received from the field. This evaluation followed both the quantitative and qualitative techniques. The quantitative survey used semi-structured questionnaires among a representative sample of beneficiary clients and patient satisfaction survey.

On the other hand, the qualitative part included Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), and some case studies of good practices.

Quantitative Sampling Method

ResInt Bangladesh used face-to-face interview at household (HH) level in rural and urban areas of the project implemented districts in Barisal division. However, a few exit interviews among the beneficiaries were administered at eye health facilities, in consultation with FHF.

Quantitative Samples Calculations

In Bangladesh, approximately 6.1% of the population aged 20-79 years has diabetes, with approximately 46% of these undiagnosed. Diabetic Retinopathy (DR) is a complication of diabetes

that can result in vision loss, and the estimated number of people with DR in Bangladesh is 1.54 million (27% persons with diabetes)(as per ToR).

Since, the program is running in Barisal division, therefore, estimated prevalence rate of diabetics in this respective division is around **1.7% (prevalence rate is calculated from using the data from BBS-2011)**.

According to the S.K Lwange, if the prevalence being studies is below 10%, therefore the level of precision should be half of the prevalence. i.e. prevalence of DR is 1.7% in Barisal division, therefore, prevalence rate would be 0.85. The following formula is used to calculate representative sample size and to capture all the target indicators.

$$n = \frac{Z^2 pq}{e^2}$$

p = Prevalence rate = 0.85
 q = (1- p)
 e = Margin of error = 5%
 Z-score = 1.96 at standard of 95% confidence interval

Thus, with the above assumptions, the required sample size for the research worked out to be **192** respondents to be surveyed in the 4 districts Barisal division. We proposed to round the sample size of **200**. The female and male distribution were roughly 50:50. The number of samples were distributed among 4 districts equally, based on the prevalence of suffering from DR.

Sample distribution by districts:

Barisal Division	Male	female	Total
Barisal	25	25	50
Patuakhali	25	25	50
Jhalokhathi	25	25	50
Brahmanbaria	25	25	50
Total	100	100	200

Quantitative Sampling Selection Procedure

Following is the sample selection procedure of the study:

- All four districts were covered in this evaluation.
- We did a small listing from the diabetics’ hospital/ service facility in the study location and from the list, the target respondents were selected randomly.
- Proportion of sample was distributed among the selected category of women and men from each of the districts.
- From the selected respondents we conducted face to face interview at HH level.

In addition to the sample survey, for qualitative research, there were observation, **FGDs, KIIs** and **Case Study** documentation. Sample of qualitative part was selected purposively from each of the targeted audience. The qualitative samples were independent of the quantitative survey, not sub-samples of the survey.

Qualitative Sample Selection Procedure

- Participants for the FGDs were invited to participate in the discussion sessions considering homogeneity.
- FGD participants were informed about the project objectives and their informed consent was taken before starting discussion or interview.
- All the respondents of the qualitative survey were selected based on their availability and willingness to participate in the survey.

Sample Distribution: At a Glance

Target Respondent/s	Area (4 Districts)	Total
Quantitative		
Beneficiaries – women	100	200
Beneficiaries– men	100	
Total	200	
Qualitative		
FGDs		
Beneficiaries – women	4	8
Beneficiaries– men	4	
Total	8	
KIIs/In-depth interviews		
Service providers i.e. ophthalmologists, hospital managers, clinical staff	8	20
Relevant stakeholders i.e. local government representative (Chairman of union, upazila), community leaders etc.	8	
FHF team at local and national level as well as partner staff	4	
Case Study		
Who received eye care services from FHF	5	5

(Distribution of FGDs, KIIs and Case Studies were finalized in consultation with FHF)

2.5 STUDY IMPLEMENTATION PLAN

Project Inception

Project Inception Meeting: After the award of the project, ResInt research team met with FHF team to discuss the details about the project, its sampling procedure, study locations, survey, draft questionnaires and FGD/IDI/KII guides, timeline, and other related issues.

Desk Review: ResInt collected necessary documents, records and literature relevant to the current assignment relevant. It helped in understanding the current level of health care services provided through the 3-tier health care system.

Inception Report: ResInt submitted an Inception Report to FHF. The report included the final set of data collection tools, sampling plan, research methodology, methodology, key performance indicators, training plan, final report outline and agreed timeline.

2.6 FIELD WORK IMPLEMENTED

Data Collection: Team Selection, and Instruments Finalization

Recruitment of Field Staff: There were two teams for data collections, one for the survey (quantitative survey among women and men), and the other for the qualitative component (through FGDs, KIIs, and observation). The field manager in association with the field executives looked after the recruitment of female and male interviewers and supervisors for a quantitative survey. The recruitment was mostly made from the existing panel of supervisors and male and female interviewers. There was little fresh recruitment as well.



Instruments: ResInt developed the structured questionnaire in Bangla (were translated into English), script, pilot test and get approved by the FHF team before the fieldwork. Researchers pre-tested the tools in the study areas before finalization to understand the flow of questions, consistency check, skip patterns, adding/dropping some questions etc. Pre-test observations were shared with FHF. *(Picture: ResInt team crossing the river)*

Qualitative Discussions Recording & Transcripts: All discussions were recorded using digital audio recorders and were transcribed (verbatim) for content analysis.

2.7 TRAINING OF THE DATA COLLECTION TEAM

The training for the researchers and field team were held centrally in Dhaka (so that all the core team could align with the objective and expected the outcome of the study). The trainees were Field Investigators (FIs), Field Supervisors (FSs) and Quality Controller (QC). The Quality Assurance team was in the training program. The research professionals were presented in the training sessions.

Mock calls and interviews practiced in the classroom before taking them to field for trial calls. The practical sessions helped FIs/FSs to have a clear understanding of each question in the questionnaire/tools. After evaluation of the performances, the successful FIs/FSs were selected for the project. The training duration was for about 2 days. A representative from FHF was invited to attend the session. Training manuals (for investigators and supervisors) was used after translating them in Bengali. *(Picture: The training session among the field team was conducted by ResInt Field Manager)*



Training Topics

- About the project, its objectives, purpose, and importance (by FHF representative)
- Subject knowledge on health/cataract, gender equity, marginalized population etc.
- Research methodology, sampling etc.
- Art of asking questions and managing the respondents
- A questionnaire, data collection, backcheck etc.
- Quality Control, Ethical issues
- Crisis management
- Motivational issues

2.8 QUANTITATIVE DATA MANAGEMENT

The data analyst/manager mainly looked after the data processing and analysis. The project coordinator and the team provided inputs at various stages of data processing and analysis in consultation with FHF.

Office Editing/Coding: Though field editing was done in the field, office editing of all the completed schedules were carried out by trained office editors as per the data entry program, which includes coding of open-ended questions, identification details, and consistency checks, before starting the data entry process.

Data Entry: Data entry was carried out under the supervision of Analysis Manager. A FoxPro package was used for entering the data obtained from the field surveys. Further, it was converted to an SPSS file for analysis. Computer-based checks were done and based on the errors generated, inconsistencies were removed, and the base data were cleaned.

Data Analysis: The data analysis was carried out using SPSS as per the tabulation plan finalized in consultation with FHF.

2.9 QUALITATIVE DATA MANAGEMENT

Transcribe of the KII: Once the KII was done, the moderator and note-taker immediately completed a quick report covering the "fresh" impressions or observations during the discussion or interview so that it was not lapsed from the memory, before transcribing the audiotape. Further, the audiotapes of the discussions were transcribed by the professional transcribers. However, the moderators, as well as a qualitative researcher, verified the accuracy of the transcriptions before analysis.

Content analysis of qualitative data: This approach was used to interpret meaning from the content of text data and, hence, adhere to the naturalistic paradigm. The qualitative analysis process was done as per following flow-chart:



CHAPTER 3

KEY FINDINGS

Key Evaluation Questions and Sub-Questions

To what extent have the community awareness and training elements of this project influenced demand for diabetes and eye health services, and resulted in regular screening and earlier diagnosis and treatment of DR?

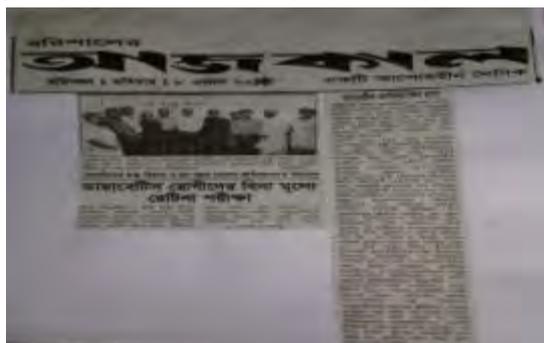
The Foundation worked in advocacy with the government and relevant health authorities to ensure FHF understand the significance of DR and recognize the importance of integrating eye care services into the care of people with diabetes. Their training initiated and influenced demand for diabetes and eye health services at a primary level.



Activities of FHF to create awareness

To create communication strategy and raise awareness in the community level project arranged bazar meeting, courtyard meeting, pot song, message board, small bill board, road shows, community orientations, activations at primary level and distribution of IEC materials.

Uthan-Baithak (meeting at the household premises) was being organized to gather women for interactive session on DR, diabetes and available services. Local village groups like women's self-help groups and volunteers play an important role in motivating diabetics to attend screening camps.



SMS regarding DR and available service were disseminated in Barisal. Local media campaign through radio, newspapers and local channels, Message boards on DR placed in locations with significant public exposure were applied to raise awareness at community level.

A special DR screening camp was organized in celebration of World Health Day on the 6th April 2018 at the DR Zone of the SBMCH campus.

Free screening and treatment were provided at the venue. Prior to the event, posters were hung up and leaflets distributed in areas of the Barisal town to create awareness of these free services for poor communities in the region. Orientation on Basic Eye Care has been provided among community members though cascade training at different locations in Barisal, Patuakhali and Jhalokathi district. During the session, the facilitator delivered the message on Diabetes mellitus, diabetic retinopathy and availability of DR services.

Community awareness message boards, bunting (festive decorations made of colorful papers showing community awareness messages), and festoon (hanging banners) have been placed in many

areas of the Sher-e-Bangla Medical College & Hospital and community awareness venues at Textile more and Karkonathi to share information about diabetes and diabetic retinopathy among the general population.

Envelopes have been developed to provide information to people following screenings. These envelopes contain detailed information on the services available in the four Diabetic Association of Bangladesh (DAB) centers, Brahmanbaria District Hospital and SBMCH, as well as key messages on Diabetes and Diabetic Retinopathy.

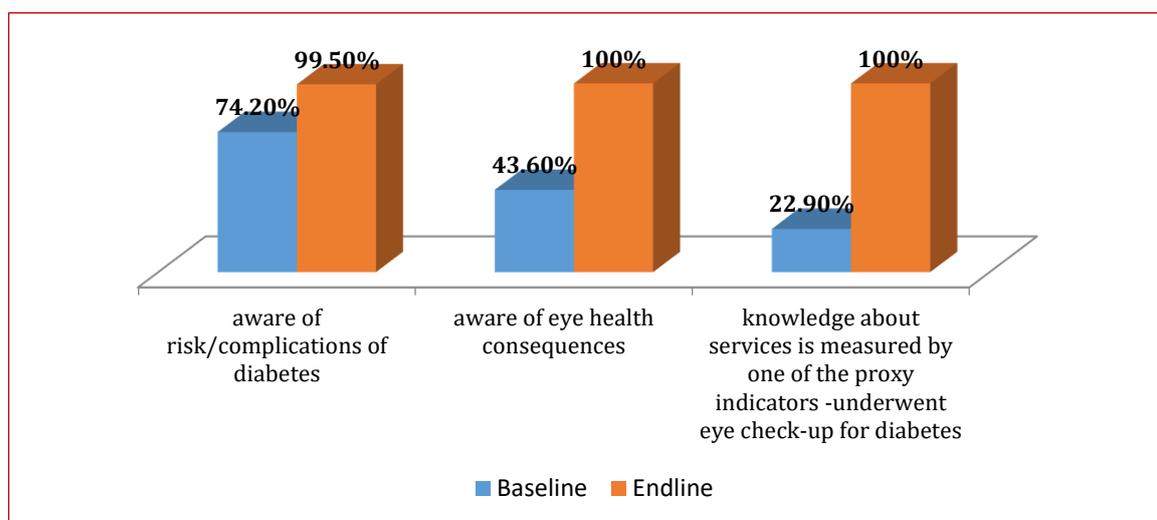
Along with these, project observed diabetes day and administrated campaign on DR through rally, seminar and organized screening camp at community. Also, T-shirts, Caps were developed for observing World Diabetics Day.

Initiatives to widely promote community awareness were helpful to create diabetic patients' demand for eye care services.

Community Awareness

- **Aware of rise/complications of diabetes:** Overall, 74.2% of community people at baseline reported that having aware of risk/complications of diabetes while 99.5% of the community people (beneficiaries) reported the same at end line.
- **Knowledge of health consequences:** Though the proportion of community people who reported that being uncontrolled diabetes causes health problem and negative consequences was quite low at baseline (43.6%), however a significant increase (57%) was observed in the proportion of community people (beneficiaries) reporting the same at end line (100%). The knowledge of harmful effects of uncontrolled diabetes (98%) and knowledge about DR (Diabetic Retinopathy) (100%) were impressive. The beneficiaries seemed to have received adequate knowledge on DR from the hospital (97%) (DAB and District Hospital), media (48.5%) and courtyard sessions (48.5%) they had attended. These encouraged them for regular screening and visit DAB center for eye check-up. They could correctly recall the prescribed lifestyle they need to follow if DR is detected. Television (95%) and publicity through miking (55%) are the main ways (media) to aware about the disease of diabetes and Diabetes retinopathy.
- **Knowledge about services is measured by one of the proxy indicators -underwent eye check-up for diabetes:** All beneficiaries at the end line (100%) as compared to baseline (22.9%) reported that they have knowledge about services - measured by one of the proxy indicators -underwent eye check-up for diabetes. The project data show that because of the sensitization, the rate of screening has increased significantly. Also, overall 48% of total patients are female who visited the DAB/districts hospital for eye treatment/screen. Control diabetics (91.7%), medicine (64.2%) and regular eye screening (49.5%) can Diabetic retinopathy (DR) disease. The exposures of raise awareness brought the beneficiaries for regular diabetes check-up. Except Barisal districts, the beneficiaries of three districts mostly visited DAB as compare to districts hospital. In Brahmanbaria, the beneficiaries visit Kawtoli diabetic center (79.2%) for diabetes check-up. Around 58% of the respondents reported that they know it very well where to go except DAB center that provide treatment of eye problem/DR problem.

Figure 1: Proportion of target population who are aware of the risks of diabetes, the eye health consequences, and available services



Does the information given at the community level to registered patients with known diabetes (DAB members) encourage them to go directly to the tertiary hospital, or to have initial screening at DAB centre?

Diabetic retinopathy is the only blinding ocular disease where severe visual loss can be avoided by retinal photocoagulation provided the screening protocol, photocoagulation indications and treatment patterns are properly followed.

From the qualitative findings, any patient who attended hospital gets the knowledge from the doctors on DR treatment. The awareness raising exposures (hospital, media and courtyard session) encouraged them for regular screening and visit DAB center for eye check-up. If DR is detected, they are referred to the department of ophthalmology in DAB for screening. Ophthalmologist evaluates the patient first to identify the DR (Fundus examination) and refer her/him to the tertiary hospital. Also, regular courtyard session and awareness activities encouraged them to go the tertiary level. However, female group prefer to visit DAB as for short distance.

“At first, I went to private practitioner to have my eyes screened. Despite spending so hefty fees, I was unable to get proper treatment. Then, after learning more about the DR services at SBMCH, I underwent treatment and was highly impressed with the service and the friendly nature of the eye consultant” – Female respondents, Barishal Sadar

Number of patients screened	No. of Patients
July- December 2016	2,662
January- June 2017	1,962
July-Dec 2017	2,354
Jan – Jun 2018	2,063

From the secondary data, it has an evidence awareness generation activity at the community level to registered patients with known diabetes (DAB members) encourage them to go directly to the tertiary hospital, or to have initial screening at DAB center.

The present data was shown a high incidence of DR. This may have been due to the fact that many patients were already diabetic for several years when first detected in DAB, but they were unaware about it. The study showed that the rising trend of the incidence of DR is may indicate that duration of diabetes, lack of physical activity, and or other risk factors influenced for higher incidence after diagnosis.

How effective were the awareness generation activities in terms of increasing knowledge and changing attitudes?

From the qualitative findings, an encouraging part of this study is that many subjects were willing to wait patiently for their turn to attend the counseling session. This reflects the thirst for information among diabetic patients. A few patients were not quite comfortable with the sessions talking to them about their medications. These patients need to be convinced about the importance of this DR Treatment and this can be done by establishing a trusting and professional relationship with them, which should motivate them to participate in such counseling/courtyard session program.

At the awareness activities, emphasis was on early identification of diabetic patients from the community and an efficient referral system so that all the diagnosed cases of diabetes may be referred for further diagnoses and treatment of DR at secondary or tertiary level. It is suggested by the DAB that patients with type I diabetes should be screened annually for retinopathy, 5 years after the onset of diabetes. Patients with type II diabetes should have initial in examination for retinopathy shortly after the diagnosis and the examination should be repeated annually or earlier, as per the severity of the retinopathy. Regular screening of DR indicates to change behavior in terms of increasing knowledge and changing attitude.

Case Study

My name is Rahim (fake name) and I'm 47 years old. My hometown is in Barishal district and I am an Assistant Education Officer by profession. I live in Jhalokathi Distrcit since it is close to my office. But since Sher-e Bangla Medical College Hospital Barishal is far away, and it took BDT 150 to go there, I sought treatment at the Diabetic Association of Bangladesh Jhalokathi to have my eyes checked. After initial screening, I was found to be a probable DR patient and I was referred to Sher-e Bangla Medical College Hospital. I then visited the Diabetic Retinopathy (DR) Zone of Shere Bangla Medical College Hospital where I received counseling from service providers and Dr. Shafiqul Islam scheduled a date for me and prescribed some pathological tests as preparatory services. After completing the tests, I attended DR Zone on the scheduled date. I was suffering from diabetes for 3 years. After I visited the DR Zone on the scheduled date, the doctor conducted my laser surgery with extreme care. I was then released with proper counseling and was again asked to come back for a follow-up treatment. I feel very grateful and happy to receive the laser treatment and I am hopeful that this surgery will reduce the risk of losing my vision.



Table: Number of people with diabetes screened for DR

Month/period	Number of people with diabetes screened for DR		
	Presented at Static Facility	Identified through Outreach*	Overall Total

	<i>(reported in monthly reports)</i>								
	Total	People with known diabetes	People with diabetes that was previously unknown	Total	People with known diabetes	People with diabetes that was previously unknown	Total	People with known diabetes	People with diabetes that was previously unknown
January	367	199	168	0	0	0	367	199	168
February	342	215	127	0	0	0	342	215	127
March	319	213	106	0	0	0	319	213	106
Total Q1	1,028	627	401	0	0	0	1,028	627	401
April	403	242	161	0	0	0	403	242	161
May	321	198	123	0	0	0	321	198	123
June	311	212	99	0	0	0	311	212	99
Total Q2	1,035	652	383	0	0	0	1,035	652	383
2018 (January - June)	2,063	1,279	784	0	0	0	2,063	1,279	784
July	428	301	127				428	301	127
August	211	145	66				211	145	66
September	419	289	130				419	289	130
Total Q3	1058	735	323	0	0	0	1058	735	323
October	350	227	123				350	227	123
November	315	166	149				315	166	149
December	X	x	x	x	x	x	x	x	x
Total Q4	665	393	272	0	0	0	665	393	272
2018 (July-December)	1723	1128	595	0	0	0	1723	1128	595

How has this project influenced referral patterns for diabetes and DR amongst the various services involved in this project? To what extent are these referral patterns effective, efficient and sustainable?

Compare and assess the horizontal and vertical referral pathways that have been established by the project

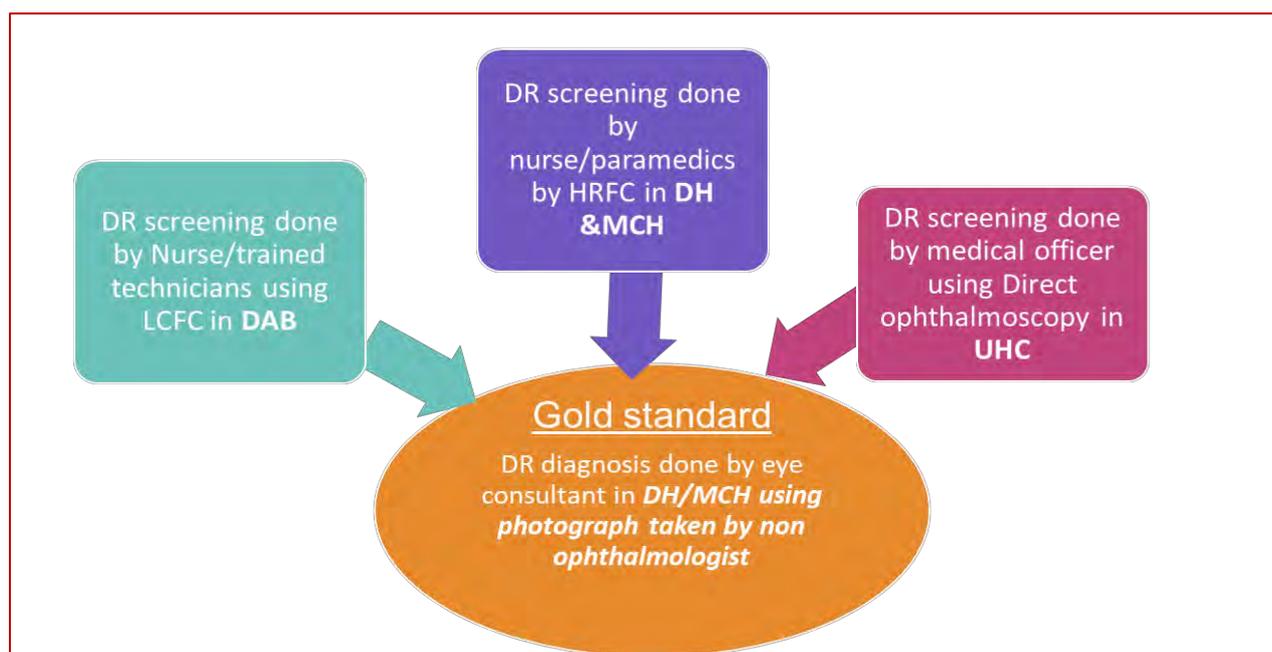
Compare referral pathway between public district hospital and DAB facilities to that between Diabetic Association of Bangladesh (DAB) center and Sher-e Bangla Medical College Hospital (SBMCH).

One of the prime aims of the project was to integrate eye care (including an annual eye exam) into routine care for people with diabetes at the primary health care level (Upazilla Health Complexes – UHC), through the DAB centers at the district level, and at district hospitals. It is expected that the system would be helpful for facilitating early identification of people with vision threatening DR, and referral for treatment as required.

Before the project implementation activities were formulated, it had been observed that there was no functional referral system exists for DR Service between primary to secondary and secondary to tertiary level. There was no referral slip, referral register and referral mechanism available. There was no system or documentation to find-out how many patients had referred (both referred-in and referred-out) in last three months to/from one specific hospital. The common practice of referral was - either to write on the prescription or to tell patient verbally.

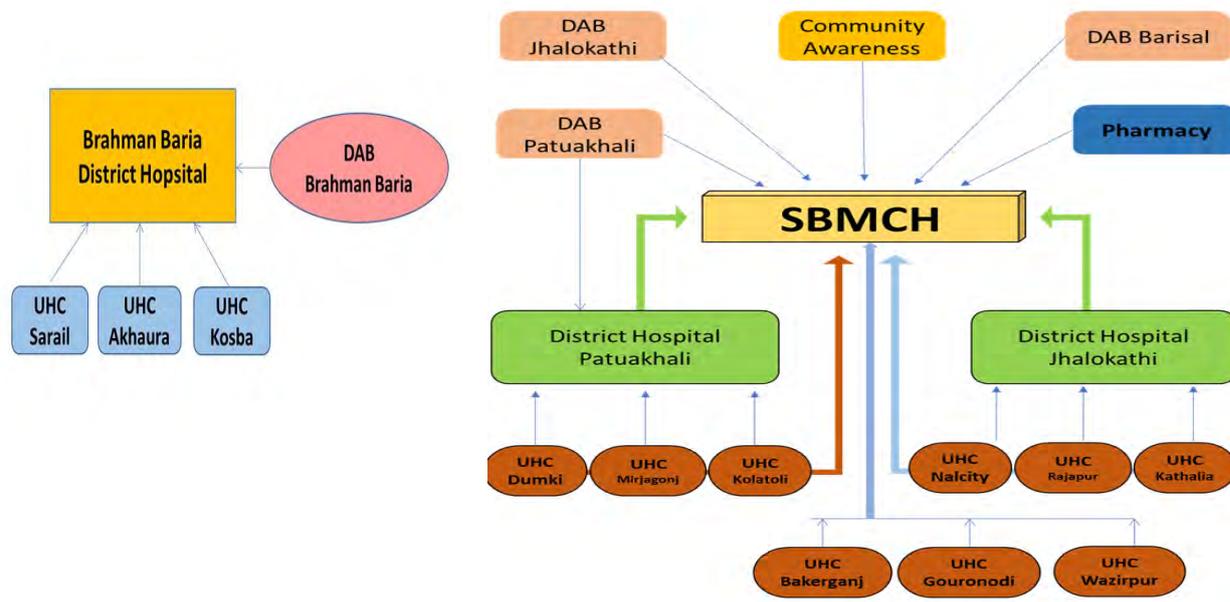
Hence, the project took the initiative to devise a referral system and has established a structured referral linkage for DR screening within the existing public health system under. A parallel referral mechanism in between DAB and public health facilities has also been established. The process of referral mechanism can be described in the following way:

Diabetic patient attending in the outdoor of the MCH DH, UHC and DAB center was 1st screened by trained non ophthalmologist health cadres and irrespective of the presence of DR, the same study participant was referred to the eye department of respective district or medical college hospital to be examined by the eye consultant for the presence of DR. DR diagnosis done by the non-ophthalmologists (paramedics, nurse and medical officers) were further evaluated by the respective eye consultant through double blinded approach. A pictorial view of the structure has been given below:



*UHC: Upazila Health Complex, DH: District Hospital; MCH: Medical College Hospital, (Source: project document)

Based on the above model, the referral system for four districts can be seen from below diagram:



Low Cost Fundus Camera were used for screening DR in four DAB centers (a non-profit voluntary health service provider). And High-Resolution Fundus Camera was used in four public facilities (three district hospitals and one medical college hospital).

Efficiency

To monitor the referral system, two types registrar book and 3 types referral cards were developed for developing and integrating services at Primary, Secondary and Tertiary level facilities. One register book was developed to record the data OPD and is being used in the sub district level hospital, DAB, District level hospital and Medical College Hospital Another register book was developed to record the data of laser treatment.

For properly identification the patients follow and strengthening the referral mechanism the three different colours cards are being issued yellow at sub district level, Green at DAB and district level hospital and Red Colour for leaser treatment which is being used at SBMCH and Brahmanbaria District Hospital.

The patient cards and referral data are being closely monitored to view the trend and analyze the patient flow. Besides, a communications network system using phone calls, emails as well as logs from physical visits to the institutions, was set up to enhance the effectiveness of the referral program through monitoring the flow of patients between facilities.

Effectiveness

Before executing the referral system, patient flow was generally from the Diabetic Association of Bangladesh (DAB) to Tertiary Level Hospital. After administering a number of community awareness

program, (cascade training, local cultural event, different types of brochure, leaflet, message board, bunting) community people gather more information about diabetics, diabetic retinopathy (DR) and about the facilities of DR services. Once referral system was established and the registered DAB patients got to know about the referral system, they started seeking service directly from the tertiary level. The charts below show the trend of patient referred to tertiary level from different service centers (DAB, eye ward and private chamber)

Figure 2: July'2017

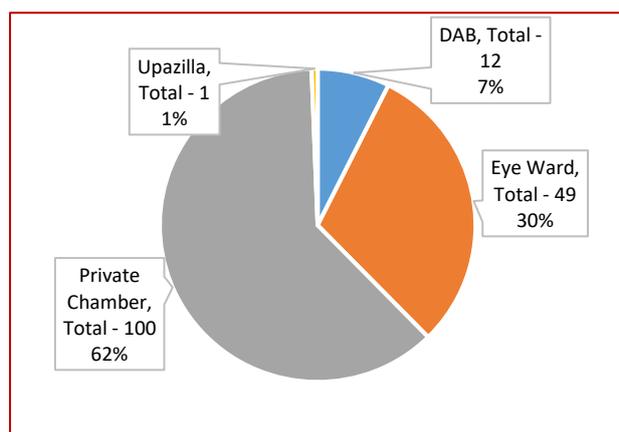
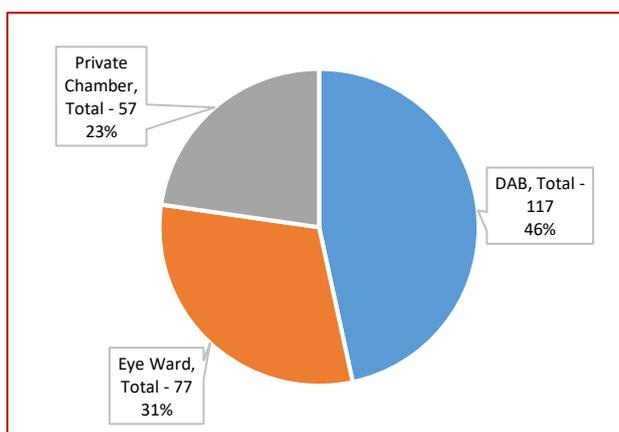


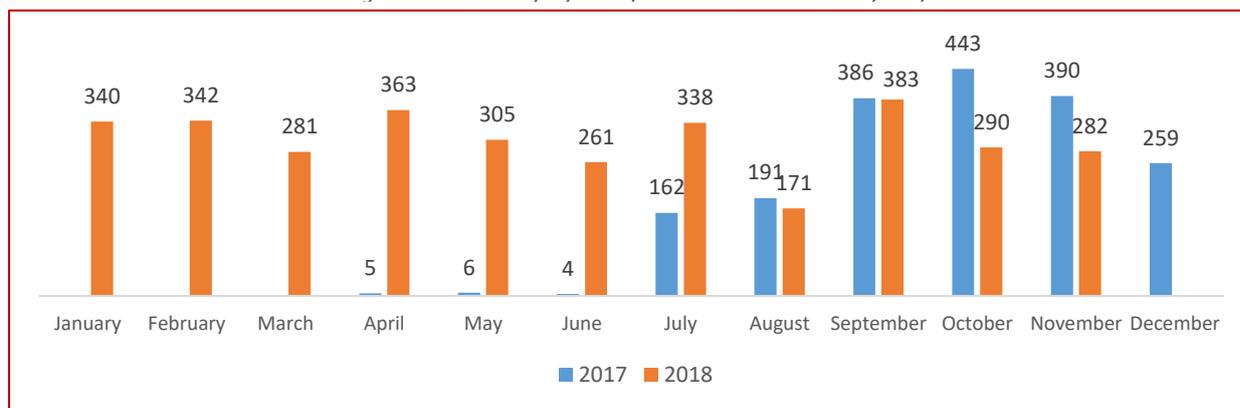
Figure 1: December'2017



Source: Project documents

Based on the project data from July'2017 to November'2018, 75% referred patients took treatment in the tertiary hospitals. The month-wise number of referred patients took treatment from these hospitals can be seen from the charts below:

Figure 3: Number of referred patients visited in tertiary hospitals



Source: Project Data

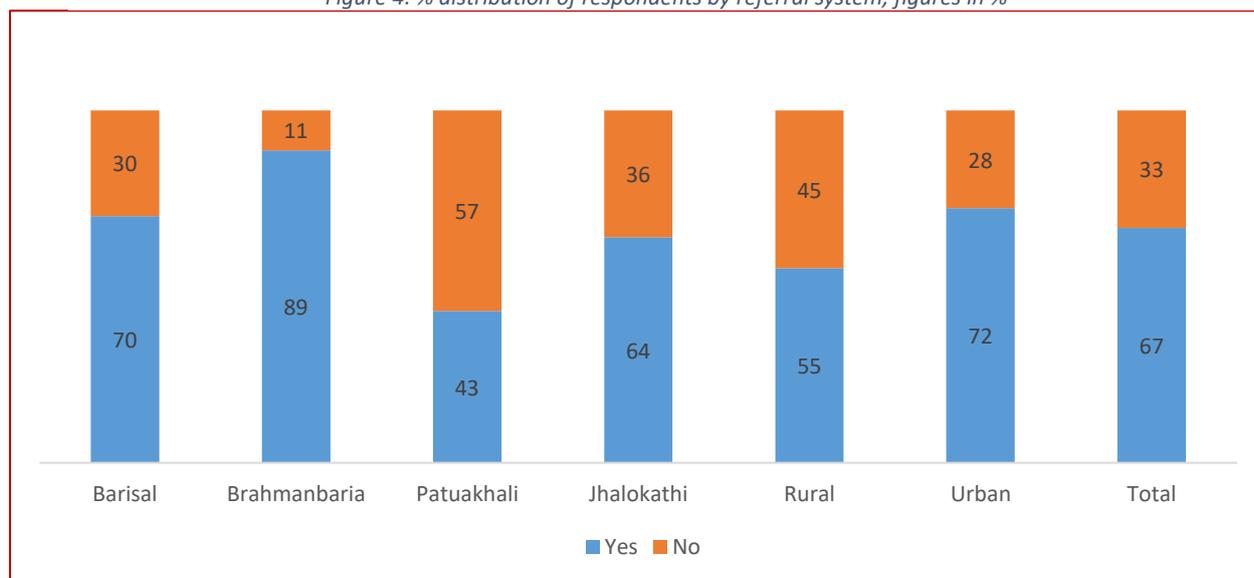
Out of these 75% (5,202 of 6,999) referred patients, 62% patients were registered in DAB. Besides, 143 referred patients were suffered from diabetes retinopathy.

In addition, out of these 5,202 referred patients, 2,383 (46%) was referred to SBMC, Barisal. The rest (54%) patients were referred to other district hospitals from DAB and other places. The data show that 330 patients referred to SBMC, hospital following horizontal referral system meaning these 330 patients were referred from DAB centers. The rest, 2053 patients referred to SBMC, Barisal from different service providers and other than DAB (vertical referral system).

Again, it was found that 980 patients were referred from DAB to the different tertiary facilities. Out of these 980 patients, as mentioned above 330 patients were referred from DAB to SBMC, Barisal and rest 650 patients from DAB to district hospitals.

The sample survey shows that 67% of the patients were referred to district hospital from DAB center, 72% being from urban and 55% from rural. Among four districts, highest number respondents were referred from Brahmanbaria (89%) and lowest from Patuakhali (43%). Details can be seen from the graph below:

Figure 4: % distribution of respondents by referral system, figures in %



Base – All Respondents

Those referred to district hospitals 77% of referred patients claimed to have continued their treatment in the district hospital. This distribution was found to be similar among gender, urban/rural and district.

Sustainability

We understand that sustainability for the purpose of this evaluation is defined to be the sustained capacity of the service providers to continue the process once the project support is withdrawn. One thing is evident from sample survey and project documents that the established referral system is accepted well and also, working. Both providers and precipitants are responded to the system. From that point of view, sustainability of the system seems ensured. However, the replication of the system in other upzillas and nationwide is also necessary in the view of sustainability.

To what extent did this project enable the various groups of the target population (including women and marginalized groups) to access diabetes and DR services, compared to before the project started? Who is still not accessing these services, and why not?

The comparison table below refers to the situation of uptake DR services and knowledge among the beneficiaries. DR projects enable the various groups of the target population (including women and marginalized groups) to access diabetes and DR services, compared to before the project started. The

females have low access to uptake eye services from DAB and districts hospital due to lack to time and partners. Details are given below.

Knowledge, Attitude and Practice questions	Baseline	End line
Whether any member of household examine eye by a doctor? (1=Yes)	26%	100%
Do you think that eye problem is also a disease? (1=Yes)	93%	99.5%
Do you regularly take care for your eyes? (1=Yes)	29%	34%
Do you think that you should consult doctor for eye problem? (1=Yes)	94%	98%
Whether examined diabetics? (1=Yes)	19%	100%
Do you know diabetics causes eye disease? (1=Yes)	9%	100%
Do you know where to go for diabetic retinopathy? (1=Yes)	8%	100%
Whether any courtyard in your area? (1=Yes)	9%	27%

Compare the gender equity between district level and tertiary level DR treatment and management

Considering the secondary data after sensitization of the beneficiaries the rate of screening has increased significantly. Overall 48% of total patients are female who visited the DAB/districts hospital for eye treatment.

Number of people with known diabetes who access an eye exam each year (gender disaggregated)

Screening	Male	Female	Total	% of female
July- December 2016	1935	1751	3686	48
January- June 2017	957	1005	1962	51
July- December 2017	1278	1076	2354	46
January-June 2018	53	50	103	49
July- Dec 2018	788	850	1683	51

Is the cost of screening within the affordable price for known diabetes? Determine the accessibility and gender sensitivity of available eye care services.

According to the beneficiaries, 91% of the beneficiaries are willing to spend an amount for eye care services. On average, they are willing to pay BDT 100 for treatment (73%). If we consider the gender perspective, most of the cases spouse of female (67%) decided that where she you will go for diabetes treatment. However, the drop-out of patients referred from the districts hospitals and DAB centre to tertiary hospital is still high among the female. Female could not visit DAB or district hospital due to long distance (70%) and lack of companion (45%).

Identify gender-specific barriers to eye health care for women: (Qualitative)

As part of gender analysis, most common barriers to women accessing eye health care as defined are

- **Cost of treatment:** Women often have less access to family financial resources to pay for eye care or transportation to reach services.
- **Inability to travel to a surgical facility:** Women often have fewer options for travel than men. Older women may require assistance, which poor families cannot provide.
- **Differences in the perceived value of DR treatment:** DR is often viewed as an inevitable consequence of ageing and women are less likely to have social support in a family to seek care.
- **Lack of access to information and resources:** Female literacy is often lower than male, especially among the elderly. Women are less likely to know about the possibility of treatment for eye disease or where to go to receive it

Both from qualitative and quantitative findings, particularly in baseline and end line for women, there was a gap in knowledge not only about eye diseases, its causes, symptoms and cures, but also about available eye health services (availability, location, time and cost). Eye care needs of women are neglected, in many cases by women themselves. This is because in most cases men are the sole earning members of their families, and women think it is logical to sacrifice their needs so that the vision of their male family members is not threatened. Financial constraints were one of the key barriers, because money had to be spent on travel and accommodation of the patient as well as an accompanying person. Transportation within Barisal Division is very challenging and time consuming, as there are usually multiple river ways and roads to be crossed – Barisal being one of the world’s largest deltas with many rivers. In many cases, overnight stay is required, and women have to depend on their sons or husbands to accompany them for overnight stays.

Make a comparative analysis of drop-out of patients referred from district hospitals and DAB center to tertiary hospitals.

From the qualitative findings, the drop-out of patients referred from the districts hospitals and DAB center to tertiary hospital is high among the female. Firstly, patient visit the DAB center for regular diabetics and eye check-up. Around 67% of the known diabetics’ patient referred to districts hospital after detecting the DR along with the referral card.

Of them, 77% only visit to the district hospital which is comparatively low in Brahmanbaria (72%) and Patuakhali (74%). Major reasons for drop-out are: not to get time for treatment (32%), followed by long distance (23%) and lack of proper information received from DAB (23%)

Female felt that lack of time, male companion and long distance discourage them to visit DAB to tertiary hospital for eye screening as referred.

What are the barriers in the uptake of DR treatment and management with regards to gender equity?

Based on the Gender Analysis (both qualitative and quantitative), innovative strategies have been already being implemented. Since women above forty years neglect their eye conditions and are more prone to acquiring cataract, they didn’t visit any DAB or district hospital for regular screening. However, the frequency of the visit in the DAB and district hospital is quite low. Most of the female (58%) reported that for regular treatment of their eye problem they visited twice a year.

Due to lack of male companion, female patients didn’t feel comfortable to visit the centers to uptake eye services. There is also evident from the qualitative findings that male family members of female patients need to be engaged during patient counseling session and different awareness raising sessions. However, the drop-out of patients referred from the district hospitals and DAB center to tertiary hospital is still high among the female. Female could not visit DAB or district hospital due to long distance (70%) and lack of companion (45%).

If we consider the gender perspective, most of the cases spouse of female (67%) decided that where she you will go for diabetes treatment. From the of qualitative findings, respondents said public hospital partners mostly frequented by rural and poor women, now have separate seating arrangements for women in the Eye out Patient Department (OPD) to make their waiting time more comfortable. Also, most of the cases female who uptake the eye services mentioned that hospital separate post-operative wards have been allocated for women by hospital administration. Similarly, electronic token systems have been introduced in the public hospitals which would previously see

men pushing women out of long queues to receive services first. Doctors can now see female and male patients alternatively and thereby ensure a more gender equitable service delivery.

4. To what extent has this project provided enough evidence to contribute to the National DR Strategy and Action Plan and to inform models of DR care across Bangladesh?

Bangladesh is in a unique position to have a *Strategic Plan for Surveillance and Prevention of Non-Communicable Diseases (NCD) in Bangladesh 2011 – 2015*.

The NCD Plan highlights an increasing trend in diabetes prevalence in rural and urban populations. Uniquely the Plan also includes prevention blindness as one of its priorities. The NCD Plan has a focus on practical, cost effective and evidence-based interventions that can be scaled up to reduce mortality and morbidity. The proposed project and the NCD Plan have common objectives:

- To increase awareness of diabetes and blindness amongst communities
- To establish and strengthen capacity of health system for prevention and control of NCDs
- To establish mechanisms for data collection, analysis and dissemination
- To promote research for the control and prevention of NCDs including diabetes and blindness

The NCD Plan recognizes that health system strengthening approaches and inputs are fundamental to creating impacts on population health. Through this proposed project, The Foundation is testing components of the health system building blocks at various locations to establish a comprehensive model of care for provision of services for people at risk of vision loss due to diabetes within the selected locations for further adaptation and scale up across Bangladesh.

The project has strong aligned with the national health/eye health strategies. The project aligns with national diabetes and blindness prevention plans and treatment plans of service provider partners. The project objectives (generate evidence, increase awareness, development and implementation of a comprehensive and integrated model of care diabetes within the health system of Barisal Division and Brahmanbaria district etc.) and implementation process (health workforce training, formative research, awareness raising program etc.) corroborate the above-mentioned claim.

The survey data show that those who attended courtyard session had been equipped with sufficient knowledge on importance of DR treatment and from where to avail the treatment. This session encouraged them for regular screening and visit DAB center for eye check-up. The awareness of importance of DR and eye treatment seems increased universally. The referral system seems work in the intended way. The patients had high satisfaction on the services received. According to them, health care provider's behavior was good and the clinical care and time what they received from them was well enough. Patient's attending at the district hospitals and medical college hospitals had good understanding on the long-term adverse effect of Diabetes Mellitus and Diabetes Retinopathy. In conclusion, based on the evidences from primary and secondary data, it can be said the project is successful to meet up different pre-defined objectives that has been set for execution and the project adopted model can be replicated nation-wide.

Has the 3 years' implementation of this project provided enough evidence to develop the National DR Strategy and Action Plan?

The project has successfully created awareness among community people on importance of treatment of DR and also has taken necessary initiatives to ensure proper treatment of the patients. These include:

- The service providers of respective facilities have received training
- The service providers of government health facilities are capable of providing DR
- A separate room is established for DR services in government facilities. Especially in Tertiary level DR zone established and district level hospital.
- A Referral mechanism has been developed vertical and horizontal way among Government and DAB.

Besides, a functional MIS system has been developed and data have been included in the government MIS system. To monitor and supervision of eye care system of the division, a division steering committee on auspices of director of health (Barisal Division). All of these initiatives contribute to enhance awareness and increase number of patients with DR and other eye complexities in the primary, secondary and tertiary health centres. Thus, the project created evidences that would help to formulate national DR strategy and action plan.

Is there enough evidence generated from this project that can be used for advocacy at the divisional and national level to inform scale up of models of care for DR across Bangladesh?

The project has already conducted three surveys: situational analysis, KAP survey and Operational research. These reports are very helpful to understand the situation of Barisal division before the project starts and after the project has been implemented. Besides, the MIS data of the project has been integrated with national data already.

In addition, the project has brought an overall change in people's outlook towards eye care and has ensured increased numbers of people are able to avail eye care in the project areas. Besides, the project has been greatly successful in providing eye care services to undeserved sectors, such as women. Also, advocacy activities taken under the project paved the way of forming up the working group which formulated the national DR strategy of Bangladesh, which has been later endorsed by the Bangladesh Government.

What elements of this project should be adopted in future DR programming?

The project initiated different activities to increase eye care awareness among community people that proved to be a successful one. These activities include:

- Arranged and conducted cascade training on Primary Eye care & DR among mass people
- Conducted Primary eye care session among Community Leader
- Developed different type of communication materials (Bill Boards, Festoons, Message Boards, Referral cards etc)
- Conducted different awareness campaign Folk song, Gambira among the mass people

Besides, the referral structure established by the project successful brought increased number of patients in the tertiary hospitals.

Hence, these two components of the project can be adopted in future DR programming.

Is this model of care effective to manage DR treatment, whether at tertiary/district/DAB center?

The project provided training to eye consultant, SACMOs (Sub Assistant Community Medical Officer), nurse, entry operator and medical officers to operate low cost fundus camera/high resolution fundus camera, DR screening etc. Hence, trained service providers are already available in these facilities. Besides, low cost fundus camera is used in the DAB centers and high-resolution fundus camera is used in the tertiary hospitals to detect DR. The accuracy rate of detecting DR is satisfactory in both cases. Besides, the operation research showed that the waiting time in the eye department for DR screening was ranged from 30 minutes to 3 hours maximum. However, the price for getting this service done particularly in public hospital was within patients' financial capacity. Considering that spending time was worth to the patients in compare to the treatment cost.

Where is the most appropriate facility for DR management and treatment for most people?

Considering the waiting time, skilled professionals, cost of treatment and equipment, Sher-e- Bangla Medical College Hospital (SBMCH) and Brhmanbaria District Hospital are the most appropriate places for DR management and treatment for most people.

CHAPTER 4

CONCLUSION AND RECOMMENDATION

According to International Diabetes Federation (IDF) Atlas, Bangladesh is a least developed country (LDC) with a disproportionately high proportion of people with diabetes. Among all people living with diabetes in the 48 LDCs, about 40% live in Bangladesh, which makes it one of the top 10 countries suffering from diabetes. It is estimated that approximately 6.1% of the population aged 20-79 years has diabetes, with approximately 46% of these undiagnosed. There are approximately 5.7 million people with diabetes in Bangladesh, and this number is expected to double by 2030. Diabetic Retinopathy (DR) and macular edema (DME) are complications of diabetes that can result in vision loss – the estimated number of people with DR in Bangladesh is 1.54 million (27% of the diabetic patients). However, there is little integration between eye health services and diabetes services, and no examples of comprehensive models where people can access co-ordinate services for diabetes and DR across the care continuum.

The project “Integrated Model of Care for Diabetic Retinopathy Within the Health System of Bangladesh” aims to support the development and implementation of a comprehensive and integrated model of care for people at risk of vision loss due to diabetes within the health system of Barisal Division (3 of 6 districts) and Brahmanbaria District (Chittagong Division), which applies and tests various approaches to delivering sub-components of the model of care. The project will seek to address demand side barriers through community awareness raising campaigns, screening and early identification of diabetes at the community level, and increased accessibility of eye services by making them available more locally and integrated within usual diabetes care locations.

It will address supply side barriers through supporting human resource development, equipment and infrastructure, enhanced co-ordination between service providers, a strengthened referral pathway between all levels of service provision (community to tertiary) including the diabetes sector through Diabetes Association of Bangladesh (DAB) centers.

The project ran for 3 years, from July 2015 until June 2018, with an additional project period added until December 2018 to conduct final project report and evaluation. During this period, the project has implemented different activities such as Arranged and conducted cascade training on Primary Eye care camp; DR among mass people, conducted Primary eye care session among Community Leader, developed different type of communication materials (Bill Boards, Festoons, Message Boards, Referral cards etc), conducted different awareness campaign such as Folk song, Gambira among the mass people.

This project evaluation initiative observes that the project has successfully accomplished the following activities:

- Community people in project area become aware of DR
- The service providers of government health facilities are providing support on DR
- The data are included in government MIS
- The service providers of respective facilities have got training on DR
- A separate room is established for DR services in government facilities. Especially in Tertiary level DR zone established and district level hospital.

- A Referral mechanism has been developed vertical and horizontal way among Government and DAB.
- Director Health (Barishal Division) has formed Divisional Steering Committee on eye health and conducted the meeting accordingly

In conclusion, it can be said that the project is successful to achieve its predefined goals and the project model is tested one which can be replicated nation-wide.

RECOMMENDATIONS

- Integration of eye care into diabetes facilities, and integration of DR into eye care units of the public sector facilities, has proved to be successful.
- Screening, management and treatment of DR may be integrated into diabetes facilities for registered persons with diabetes.
- Disseminating information and increasing community knowledge about diabetes and its consequences creates community demand for the utilization of DR services in these facilities.
- Especially, women with diabetes and DR gets proper access to DR management services, if such services are available at district level healthcare facilities.
- Treatment of DR should be introduced into the diabetes centers/ DAB's, as these facilities have registered patients and have their data (e.g. their case and family history).
- If given proper training, MLOPs/AOPs would be capable of diagnosing DR among patients with diabetes, through Low-Resolution Fundus Camera.
- Low-Resolution Fundus Cameras is capable of detecting DR; however, it has its limitations (the stage or the severity of DR mostly cannot be detected by Low-Resolution Fundus Cameras). However, a study conducted by ICDDR, concluded that it is a more cost-effective equipment compared to High Resolution Fundus Camera, especially for resource poor settings.
- The pilot study could be scaled up at all Medical Colleges and Hospitals, nationwide.