



Feasibility Study of the “Mobile Eye  
Doctor project supported by METI:  
Market Assessment Report



Prepared for

**MITAS Medical Inc.**

**Date: November 7, 2022**

Prepared by

**NewVision Solutions Ltd.**

*House 85 (1st Floor), Block F, Road 3, Banani, Dhaka  
1213, Bangladesh*

Phone: +88-02-2222 70693

Email: [mkt-research@newvision-bd.com](mailto:mkt-research@newvision-bd.com)





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## Executive Summary

Ophthalmology sector in Bangladesh is lacking behind compared to its other peers. While divisional cities are blessed with the availability of ophthalmologists that too for a high cost, the rural and undeveloped cities don't enjoy that facility. Widescale campaigns from NGOs in rural areas has been a huge helping hand in development of the sector in Bangladesh.

There are around 1200 certified ophthalmologists in the country, while many of them are Dhaka based for obvious reasons. The cost of treatment in public sector provided health care is low but that of private sector enjoys a wide spectrum of cost. Of the surveyed locations there is absence of public sector provided ophthalmologists, which force them to seek help in private facility or in public sector provided eyecare in nearby available area.

The survey team of NewVSION Solutions Ltd talked with the patients of both outdoor and admitted patients of the eyecare facilities of the pre-selected districts. However, the patients were chosen randomly. Most patients in the public provided facilities belong to a lower income group. The patients of private sector are usually from upper-middle class of income but depending on the severity of disease and case people from lower income group were also seen.

The commonly found eye diseases by the survey team are *Refractive error, Cataract, Glaucoma, Dacryocystitis, Ocular Trauma, Ocular Injury, Conjunctivitis*. Most patients of ophthalmic diseases in Bangladesh belong to the age of 40 and above. The percentage of child patients are very low (4%-5%).

Two components help the cause of higher willingness to pay in case of health seeking behavior of people, namely – pursuit of better treatment and the pursuit of rapid treatment. In the government provided facilities;

delayed treatment along with unavailability of doctors after office hours restricts people from seeking services in those sectors. However, Bangladesh being a country of lower middle income; majority of the patients are forced to seek for low-cost and government provided healthcare. But due to the scarcity of public sector provided ophthalmologists patients are forced to visit private hospitals.

Of the surveyed eyewear shops, the survey team found that most of the shops procure their stock from Patuatuli (Biggest eyeglass market of Bangladesh). Chittagong also has a eyeglass market and procurement of shops in Chittagong are made from there.

NewVision Solutions Ltd. tried to understand the overall existing scenario of ophthalmology sector of Bangladesh and proposed a business model for the Mobile Eye Doctor Project at the end of discussion and analysis of the data collected.

## List of Acronyms

<b>AIT</b>	Advance Income Tax
<b>AT</b>	Advance Tax
<b>ATV</b>	Advanced Trade Vat
<b>AV</b>	Assessable Value
<b>BGS</b>	Bangladesh Glaucoma Society
<b>BIDA</b>	Bangladesh Investment Development Authority
<b>BDT</b>	Bangladeshi Taka
<b>BNCB</b>	Bangladesh National Council for the Blind
<b>BNSB</b>	Bangladesh National Society for the Blind
<b>BOITA</b>	Bangladesh Optical Industries & Traders Association
<b>BOR</b>	Bed-occupancy rate
<b>CAGR</b>	Compound Annual Growth Rate
<b>CCT</b>	Central Corneal Thickness
<b>CEC</b>	Corneal Endothelial Cell
<b>CD</b>	Customs Duty
<b>CIPRB</b>	Centre for Injury Prevention and Research, Bangladesh
<b>CMSD</b>	Central Medical Stores Depot
<b>CSR</b>	Cataract Surgical Rate
<b>DCR</b>	Dacryocystorhinostomy
<b>DGDA</b>	Directorate General of Drug Administration
<b>DGHS</b>	Directorate of General Health Services
<b>ECSAT</b>	Eye Care Service Assessment Tools
<b>Femto</b>	Femtosecond-assisted
<b>FFA</b>	Fundus Fluorescein Angiography

<b>ESD</b>	Effective Supplementary Duty
<b>Govt.</b>	Government
<b>HS Code</b>	Harmonized System Code
<b>IPEC</b>	Integrated People-centred Eye Care
<b>JICA</b>	Japan International Cooperation Agency
<b>KGM</b>	Kilogram
<b>KII</b>	Key Informant Interview
<b>Lasik</b>	laser in-situ keratomileusis
<b>LC</b>	Letters of Credit
<b>METI</b>	Ministry of Economy, Trade and Industry
<b>MOHFW</b>	Ministry of Health and Family Welfare
<b>MoLGRDC</b>	Ministry of Local Government, Rural Development and Cooperatives
<b>MSVI</b>	Moderate to Severe Vision Impairment
<b>NBR</b>	National Board of Revenue
<b>NEC</b>	National Eye Care
<b>NIO</b>	National Institute of Ophthalmology
<b>NMB</b>	Number
<b>OPD</b>	Outpatient Department
<b>OSB</b>	Ophthalmological Society of Bangladesh
<b>PFA</b>	Patient Flow Analysis
<b>PRK</b>	Photorefractive keratectomy
<b>PTK</b>	Phototherapeutic keratectomy
<b>RD</b>	Regulatory Duty
<b>RGD</b>	Rigid Gas Permeable
<b>SD</b>	Supplementary Duty
<b>TTI</b>	Total Tax Incidence
<b>USD</b>	US Dollar (* 1 USD = 97 BDT, current exchange rate) <sup>1</sup>
<b>VAT</b>	Value-Added Tax
<b>WHO</b>	World Health Organization

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<sup>1</sup> For current year USD values, the conversion is based on current exchange rate, while for previous year USD values, the conversion is based on that particular year's exchange rate.

## Glossary

Term	Definition/ Description
<b>NEC (National Eye Care)</b>	The Bangladesh government being a signatory of global campaign Vision 2020, formulated a National Eye Care plan under the leadership of Bangladesh National Council for the Blind (BNCB) <sup>2</sup> to eliminate avoidable blindness by the year 2020. Development of this plan involved country's stakeholders including national and international NGOs working for control of blindness. NEC is an Operation Plan (OP) under the Health, Population and Nutrition Sector Development Program 2011-2016 (2 <sup>nd</sup> Phase). Three major areas of eye disease control have been prioritized in the plan. These are cataract surgery, childhood blindness prevention, correction of refractive errors and low vision while recognizing the need for focusing on the sub-specialty services such as cornea, retina, glaucoma etc. as the emerging priorities.
<b>ECSAT (Eye Care Service Assessment Tools)</b>	A standardized tool by WHO that assesses an eye health system across six 'building blocks' to assess a country's Eye Health Services and their integration into the comprehensive health system. The WHO tool intends to support countries in the planning, monitoring of trends and the evaluation of progress towards implementing IPEC. It is designed primarily for national and district Ministry of Health eye care planners and policy-makers.
<b>Ophthalmologist</b>	An ophthalmologist specializes in comprehensive medical and surgical care of the eyes and vision, i.e., doctors specializing in Ophthalmology.
<b>Ophthalmic personnel</b>	Ophthalmic medical personnel include, ophthalmic assistants, ophthalmic technicians, ophthalmic medical technologists, refractionists, orthoptists, optometric assistants, opticians, contact lens technicians, ophthalmic nurses, ophthalmic photographers, and others.
<b>Optometrist</b>	An optometrist cannot perform surgery, but can prescribe medications and treat certain eye diseases. States may limit which conditions an optometrist can treat.
<b>Assessable Value (AV)</b>	The assessable value is a property's determined valuation to calculate the appropriate tax rates. Assessable Value = Market Value * (Assessment Rate/100).
<b>CD</b>	Customs duties are charged under the customs act, 1969 (Ref: Bangladesh Customs Tariff 2022-23). $CD = AV * CDR/100$ . [R=rate]
<b>RD</b>	Regulatory Duty is levied on a flat rate of 3% of AV for those items where SRD-CD (statutory customs duty) is 25%. $RD = AV * RDR/100$ .
<b>ESD</b>	$ESD = (AV + CD + RD) * SDR/100$
<b>VAT</b>	VAT is imposed by VAT act 47 of 2012 at a flat rate of 15% of "duty paid value" (AV+CD+RD+ESD).
<b>AT</b>	Advance Tax is applied on all imports under section 31 sub-section 2 under VAT Act, 47 of 2012. AT is levied 3% in case of imported raw materials for manufacturing industry and 5% in other cases on "VAT paid value".
<b>AIT</b>	Advance Income Tax is levied under rule 17A of Income Tax Ordinance, 1984 at a flat rate of 5%, some of them are 1%, 2%, 3%, 20% and some are levied by specific duty BADT 500 per ton on AV (assessable value). $AIT = AV * AITR/100$ .
<b>EVAT</b>	Effective Value Added Tax (EVAT) = $(AV + CD + RD + ESD) * VATR/100$ .
<b>EAT</b>	Affectivbe Advance Tax (EAT) = $(AV + CD + RD + ESD) * ATR/100$ .

<sup>2</sup> BNCB is an apex body under the Ministry of Health & Family Welfare.

<b>TTI</b>	Total Tax Incidence (TTI) = CD+RD+ESD+EVAT+AIT+EAT.
<b>Primary, Secondary &amp; Tertiary health care facility</b>	Primary care involves patients' primary healthcare providers, secondary care deals with specialists and tertiary care is a higher level of specialised care within a hospital. Knowing these levels of healthcare is important for anyone looking to work in the healthcare industry.
<b>Streamlight PRK</b>	Photorefractive Keratectomy Laser Eye Surgery using the Touchless Trans-epithelial Streamlight System.
<b>T-PRK</b>	Trans-epithelial PRK is an advanced form of PRK where the laser itself removes the epithelium before proceeding to alter the corneal shape to correct mild to moderate nearsightedness, farsightedness and/or astigmatism. TransPRK uses a laser while PRK uses alcohol to remove the epithelium.
<b>PTK</b>	Phototherapeutic keratectomy (PTK) involves treating anterior corneal lesions by superficial corneal ablation using an excimer laser (193 nm). Some of the commonly treated conditions include recurrent corneal erosions (RCE), corneal dystrophies, spheroidal degeneration, keratoconus, and corneal scars.

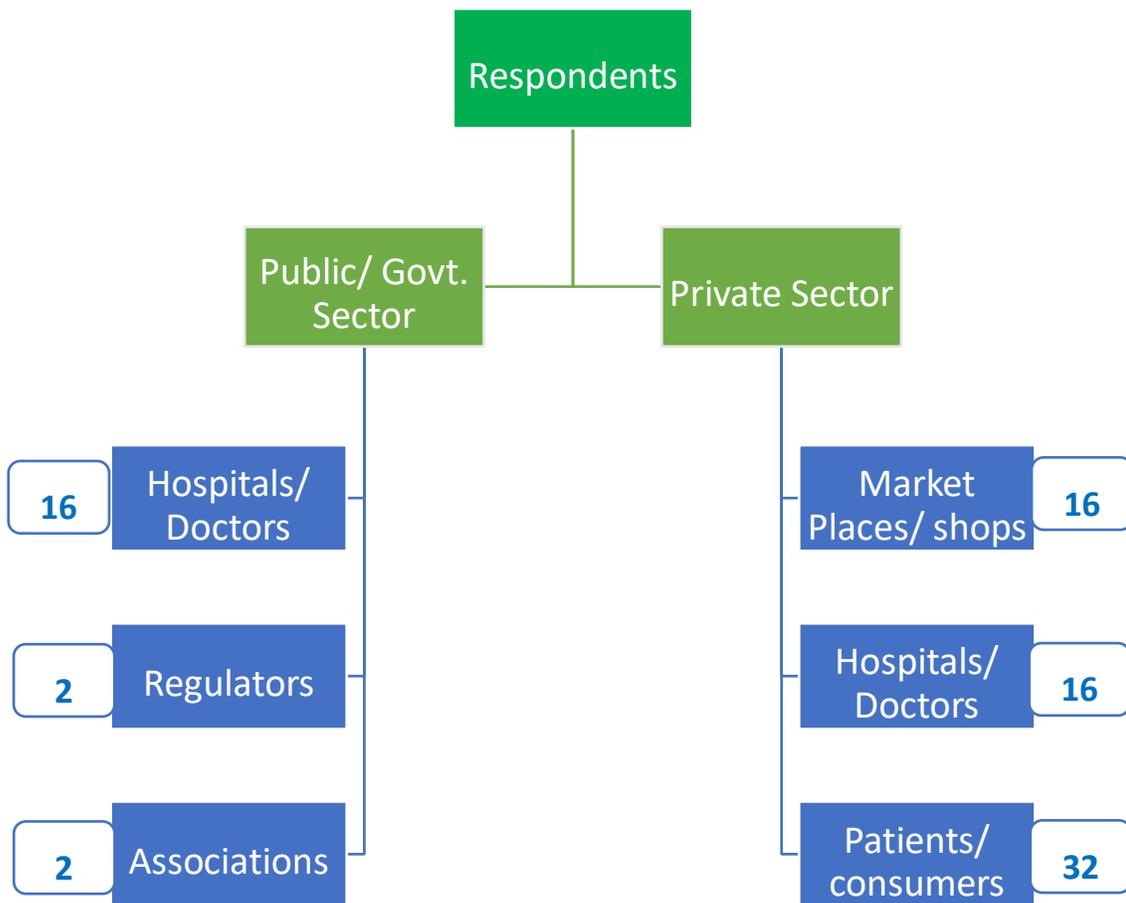
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## Methodology

### Primary Study

The whole survey study is a qualitative research based on findings from secondary and primary data. The following mappings will provide a complete overview about the stages of the methodology to be adopted by the consultant:

*Figure 1: Respondent Mapping*



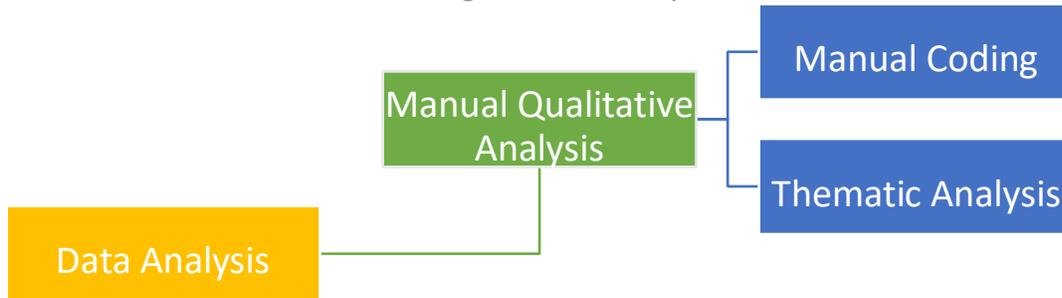
Source: Depiction by NewVision Solutions Research Team Respondents:

A total of 84 respondents were identified and surveyed from 5 different groups including: i) Hospitals/ Doctors, ii) Regulators, iii) Associations, iv) Patients/ Consumers. The number of surveys required for each group is mentioned above the individual group boxes depicted in Figure-1.

Primary Data:

Data of relevant indicators have been collected from the above-mentioned sources in the Key Informant Interview (KII) format.

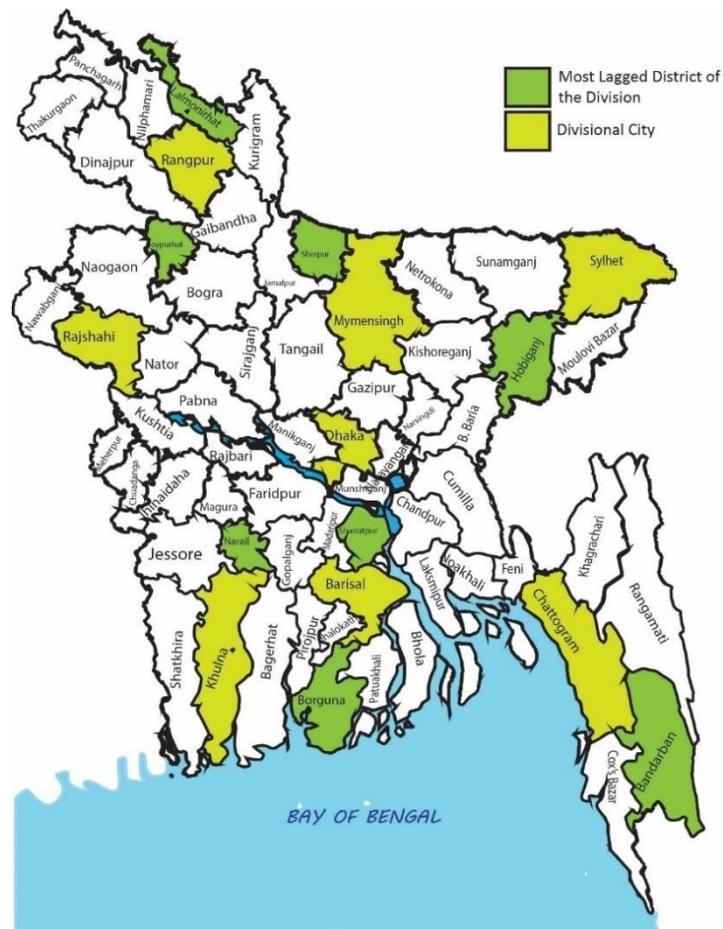
Figure 2: Data Analysis Process



Source: Depiction by NewVision Solutions Research Team Data Analysis:

Qualitative research tools such as Manual Analysis using the Coding Approach & Thematic Analysis has been applied to analyze the collected data.

Figure 3: Survey location mapping - Division & District wise



Location:

The surveys were executed in 16 districts in total. Out of the 16 districts, 8 are divisional cities (also districts) and 8 are the most lagged districts each from the 8 divisions. Except the hospitals, other respondents from associations, regulators and shop clusters are mainly based in Dhaka.

Most Lagged Districts of Bangladesh:

A study conducted by a renowned economist of Bangladesh, identified the most lagged districts of Bangladesh (Khondker [1] and Mahzab, 2015). During the calculation, the authors ranked all the 64 districts of Bangladesh from most lagged to most advanced districts. Using the ranking, we picked the most lagged district of each division. Thus, we picked eight (08) most lagged districts and also picked the eight (08) divisional cities which are also districts.

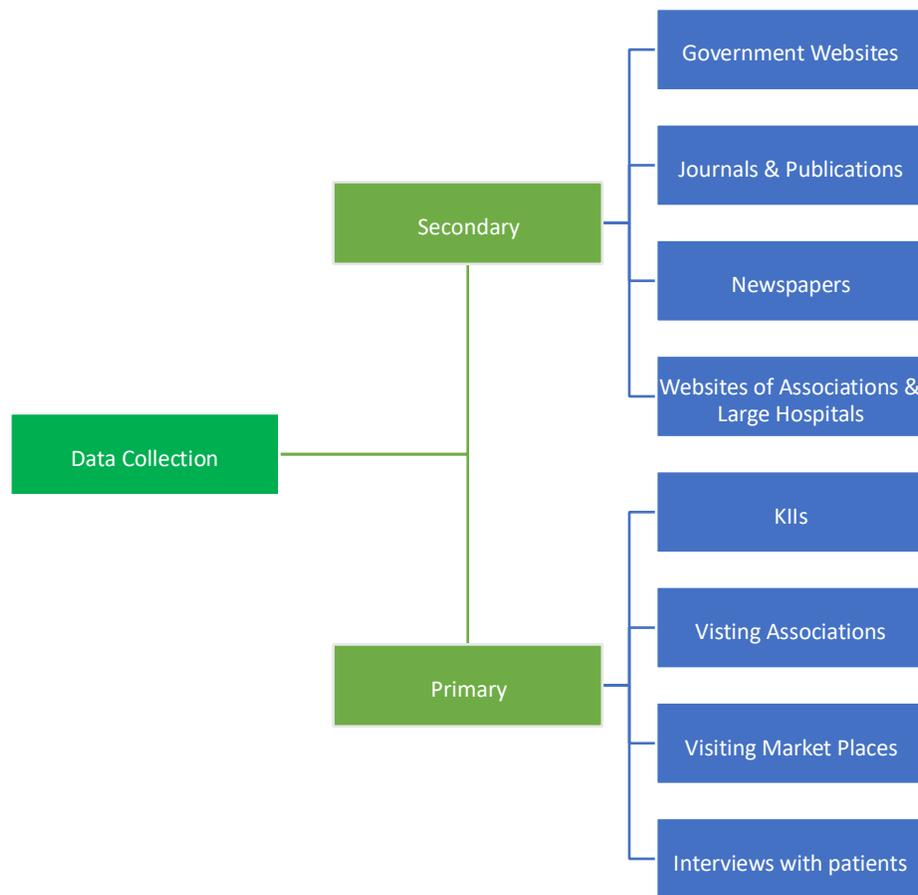
Ranking was calculated based on below indicators:

1. Road Connectivity
2. Electricity Access
3. Credit facility
4. Education Facilities
5. Health Facilities
6. Water Supply
7. Overseas Employment

So, we suggest sixteen (16) districts for field investigation/ Primary Survey. Below are the areas for Survey.

Table 1: Potential survey locations in Bangladesh - Division & Lagged City wise

Division	Focused Area	Reason of Choosing these area
Barisal Division	Barisal	Divisional City
	Borguna	Lagged
Chattogram Division	Chattogram	Divisional City
	Bandarban	Lagged
Dhaka Division	Dhaka	Divisional City
	Sariatpur	Lagged
Khulna Division	Khulna	Divisional City
	Narail	Lagged
Mymensingh Division	Mymensingh	Divisional City
	Sherpur	Lagged
Rajshahi Division	Rajshahi	Divisional City
	Joypurhat	Lagged
Rangpur Division	Rangpur	Divisional City
	Lalmonirhat	Lagged
Sylhet Division	Sylhet	Divisional City
	Hobiganj	Lagged



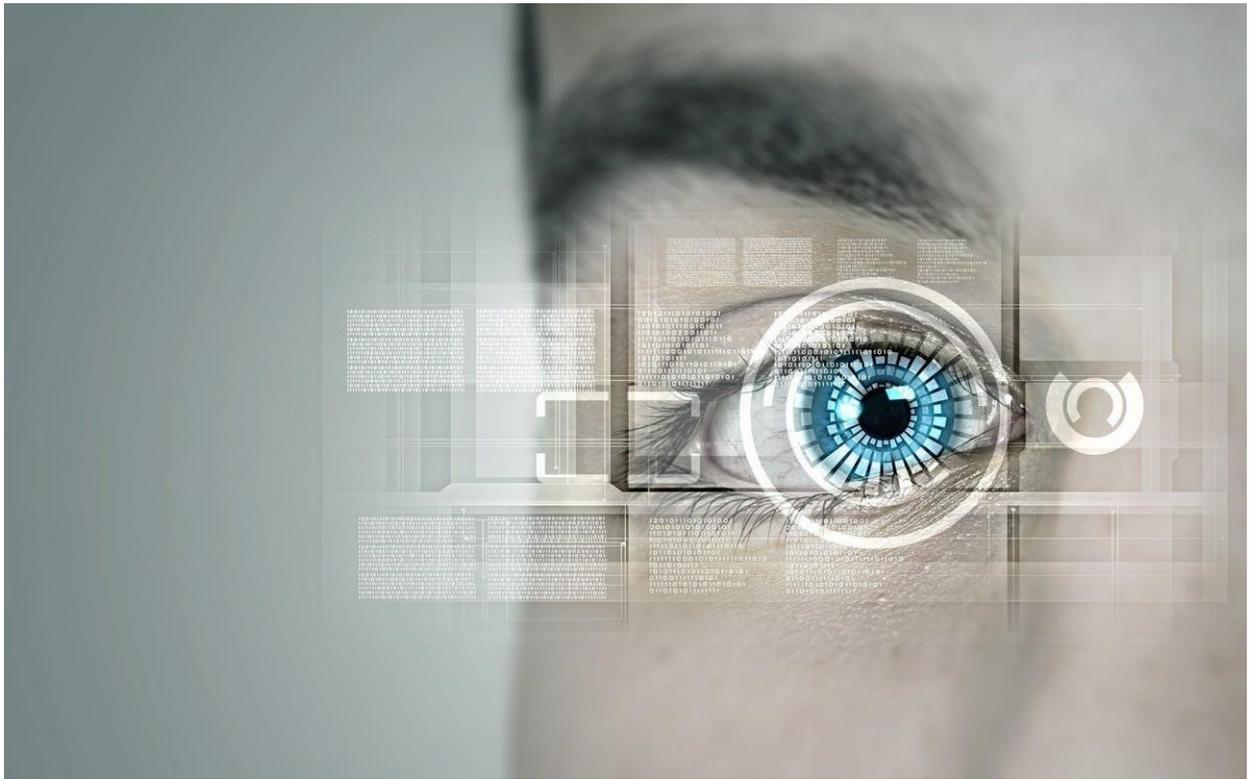
## Secondary Study

For the secondary study based Interim Report of Market Assessment for the Bangladesh eyewear market and ophthalmology, around 30 secondary sources were reviewed. The secondary sources include newspapers articles, research papers published in peer reviewed journals, global data platforms such as Statista, eyewear market related websites, eye hospital websites etc.

Each of the contents are curated following the three main scopes of work under the market assessment phase. All the prices and costs were converted into USD values (BDT 102.85 against USD 1). The references for different data are provided as footnotes.

*Figure 4: Secondary Data Collection Methodology*

**Note:** The data mentioned from years such as 2018, 2019, 2020 (from recent years) are the latest ones found. The Consultant will update the Figures while conducting the primary survey with hospitals and relevant associations.



# OPHTHALMOLOGY SECTOR IN BANGLADESH

## Chapter 1: Ophthalmology Sector in Bangladesh

## 1.1 Overview

Bangladesh formulated a national eye care plan being the commissioner for oaths to vision 2020, a global campaign for elimination of avoidable blindness by 2020. Eye care planning is led by the National Eye Care (NEC). There is a national eye health action plan and a national eye health coordination office under the ministry of health. The health delivery system primarily includes government and non-profit facilities with 8 hospitals delivering specialist eye care services across the country. A significant proportion of eye care is provided through community outreach camps and a network of primary and community health workers (Hussain et al., 2022). Besides, only 79 glaucoma specialists are providing treatment to around 2.5 million glaucoma patients across the country (2018).<sup>3</sup> The government of Bangladesh has also set aside BDT 828 million (\$8.05 Million) to spend on national eye care over the next five years – four times higher than the previous budget. (2017-22)<sup>4</sup>

According to the Ophthalmology Society of Bangladesh (OSB), the country has 1,300 eye specialists as of mid-March 2021. That is, there are only 8 ophthalmologists per million people in the country. And only 12 ophthalmic personnel per million people (Seva Foundation, 2021). There are about 100 doctors specialised in retina and glaucoma. There is a total of 344 eye care facilities in Bangladesh (as of 2019), where a total of 422,905 cataract surgeries were conducted in 271 health facilities.<sup>5</sup>

*Table 2: Eyecare facilities in Bangladesh*

Type of Facility	Number
Government	78
Private	191
NGO	75
<b>Total</b>	<b>344</b>

According to study conducted over 271 eyecare facilities by Hussain et al. (2022) during 10th June to 30th June 2018, the following frequency distribution was found by division:

*Table 3: Distribution of 271 eye health facilities in Bangladesh by division<sup>6</sup>*

Division	Government		NGO	Total
		Private		
Dhaka	8	42	14	64
Barisal	5	15	7	27
Khulna	2	13	6	21
Sylhet	4	21	11	36

<sup>3</sup> The Independent, 2018. <https://m.theindependentbd.com/printversion/details/176540>

<sup>4</sup> Sightsavers Bangladesh <https://www.sightsavers.org/news/2017/06/bangladesh-eye-care-budget/>

<sup>5</sup> Hussain E., Husain L., Roy A., et al. 2022. Assessment of eye health care services of Bangladesh using eye care service assessment tools. International Journal of Research in Medical Sciences. DOI: <https://dx.doi.org/10.18203/2320-6012.ijrms20220275>.

<sup>6</sup> Hussain E., Husain L., Roy A., et al. 2022. Assessment of eye health care services of Bangladesh using eye care service assessment tools. International Journal of Research in Medical Sciences. DOI: <https://dx.doi.org/10.18203/2320-6012.ijrms20220275>.

Rajshahi	2	19	8	29
Rangpur	1	13	5	19
Chattogram	6	31	13	51
Mymensingh	2	13	10	25
<b>Total</b>	<b>30</b>	<b>167</b>	<b>74</b>	<b>271</b>

The government has recently announced a phase-wise setting up of community vision centers in all upazilas of the country. On 11 March 2022, the Prime Minister inaugurated the centers at 70 upazila health complexes in five divisions.<sup>7</sup>

*Table 4: The breakdown of public sector provided healthcare facilities*

Owner agency	Facility type	No. of Facilities
DGHS	Medical University	03
DGHS	Postgraduate Institute & Hospital	12
DGHS	Medical College Hospital	29
DGHS	Public Health Institution	07
DGHS	Institute of Health Technology	15
DGHS	Specialized Hospital	09
DGHS	Specialized Health Center	04
DGHS	300-500 bed Hospital (not district hospital)	02
DGHS	50-bed Hospital	05
DGHS	30-bed Hospital	03
DGHS	31-bed Hospital	08
DGHS	25-bed Hospital	01
DGHS	20-bed Hospital	38
DGHS	10-bed Hospital	14
DGHS	District/General Hospital	61

<sup>7</sup> The Business Standard, 2021. <https://www.tbsnews.net/economy/industry/spectacular-growth-spectaclesmarket218365>

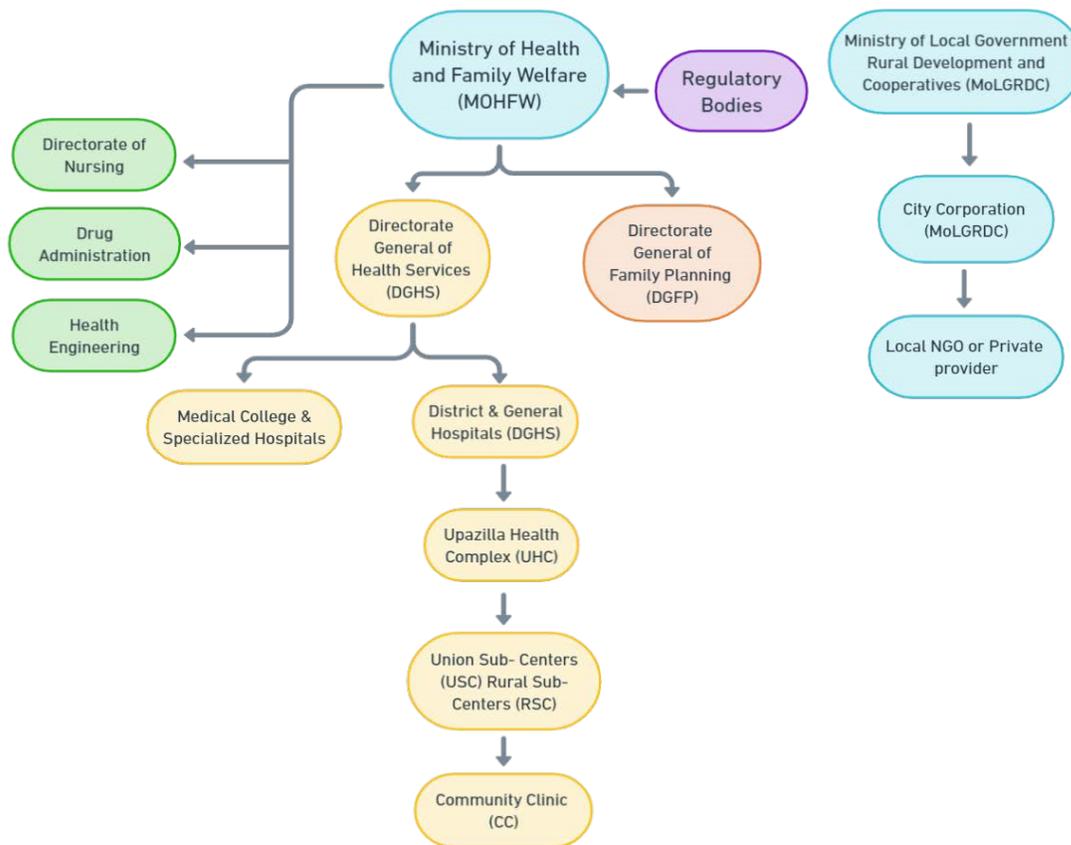
DGHS	Upazila Health Complex	429
DGHS	Infectious Disease Hospital	05
DGHS	Union Health & Family Welfare Center (UH&FWC)	770
DGHS	Union Health Center	3,161

DGHS	Union Health Sub Center	1,315
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DGHS	Community Clinic	14,054
DGHS	NGO Hospital/Clinic	N/A
DGHS	Divisional Level Office	N/A
DGHS	District Level Office	N/A
DGHS	Upazila Level Office	N/A
DGHS	School Health Clinic	23

Bangladesh's health care system has two ministries, one for rural and urban primary care and another for service provision. Under the MoH, there are two wings named directorate of general health services (DGHS) and the ministry of health and family welfare (MOHFW). The DGHS and MOHFW are responsible for simultaneous implementation of health and family planning services, mostly at the secondary and tertiary levels. On the other hand, the ministry of local government and rural development and cooperatives (MoLGRDC) acts for primary-level service provision at the ward and community level of urban areas. However, for rural areas, some non-state actors and private informal providers maintain the primary level of care. All human resources of such as physicians, nurses are appointed by the government.

*Figure 4: Health system structure of Bangladesh*



Source: Hussain et al., 2022

The primary survey from the respondents implies that there is a bilateral symmetry in the ophthalmology sector of Bangladesh. Where the developed urban areas depict a similarity to the existing situation and the lagged areas depict another type of similarity of the situation across the country.

The developed towns of Bangladesh are blessed with the availability of public sector ophthalmologists as well as private sector provision of such services. The private healthcare facilities in Bangladesh are mostly located close to each other in a certain area, which allows an increase in competitiveness. One major takeaway from such a locational pattern is that it allows the patients a great variety of service providers as well as access to the perfect information about the desired service.

The survey team of NewVSION Solutions Ltd found another shocking scenario in the lagged areas of Bangladesh. Most of the locations are facilitated with the presence of a public sector-provided ophthalmologist. Patients in those areas must seek service from the private sector. While the private provision of such service is costly – the income of the majority of people is well below compared to that of developed areas.

The frequently found diseases are - *Refractive error, Cataract, Glaucoma, Dacryocystitis, Ocular Trauma, Ocular Injury, Conjunctivitis.*

The following table helps to understand a better picture of public sector eyecare in the country. Allocation of ophthalmologists in Divisions and pre-selected districts are stated below-

Table 5: Allocation of ophthalmologists in the country

**Public Sector Health Workforce (Ophthalmologist)<sup>8</sup>**

<sup>8</sup> Directorate General of Health Services, Bangladesh

Division	Number of Position Sanctioned/ Approved	Male Ophthalmologist Appointed	Female Ophthalmologist Appointed	Total Ophthalmologist Appointed	Position Vacant
Dhaka	183	65	19	84	99
Chattogram	72	30	4	34	38
Rajshahi	46	10	3	13	33
Khulna	44	10	1	11	33
Rangpur	41	12	3	15	26
Barisal	30	5	0	5	25
Mymensingh	28	9	2	11	17
Sylhet	17	8	2	10	7
<b>Bangladesh</b>	<b>461</b>	<b>149</b>	<b>34</b>	<b>183</b>	<b>278</b>

The population of is 168,694,817 (168.6 million) and it is not decreasing<sup>9</sup>. In contrast to the population of the country, the availability of ophthalmologists is a matter of immediate concern. There is only one Ophthalmologist available for nearly 6.2 million of people. (SEVA: Bangladesh Fact Sheet. Since 1978,

Seva has provided sight-saving surgeries, eyeglasses, medicine, and other eye care services to more than 50 million people in under-served communities.)<sup>10</sup>

*Table 6: Allocation of ophthalmologists in pre-selected districts*

**Health Workforce (Ophthalmologist)**

District	Number of Position Sanctioned/ Approved	Male Ophthalmologist Appointed	Female Ophthalmologist Appointed	Total Ophthalmologist Appointed	Number of Position Sanctioned/ Approved	Population <sup>11</sup>
Dhaka	78	31	15	46	32	14,734,025
Sariatpur	2	0	0	0	2	1,294,561
Chattogram	22	14	3	17	5	9,169,464
Bandarban	1	1	0	1	0	481,109
Rajshahi	12	6	2	8	4	2,915,013
Joypurhat	3	1	0	1	2	956,430
Khulna	8	3	1	4	4	2,613,385
Narail	2	0	0	0	2	788,673
Rangpur	12	5	3	8	4	3,169,615
Lalmonirhat	2	0	0	0	2	1,428,406

<sup>9</sup> [https://www.worldometers.info/world-](https://www.worldometers.info/world-population/bangladeshpopulation/#:~:text=The%20current%20population%20of%20Bangladesh,the%20latest%20United%20Nations%20data.)

population/bangladeshpopulation/#:~:text=The%20current%20population%20of%20Bangladesh,the%20latest%20United%20Nations%20data.

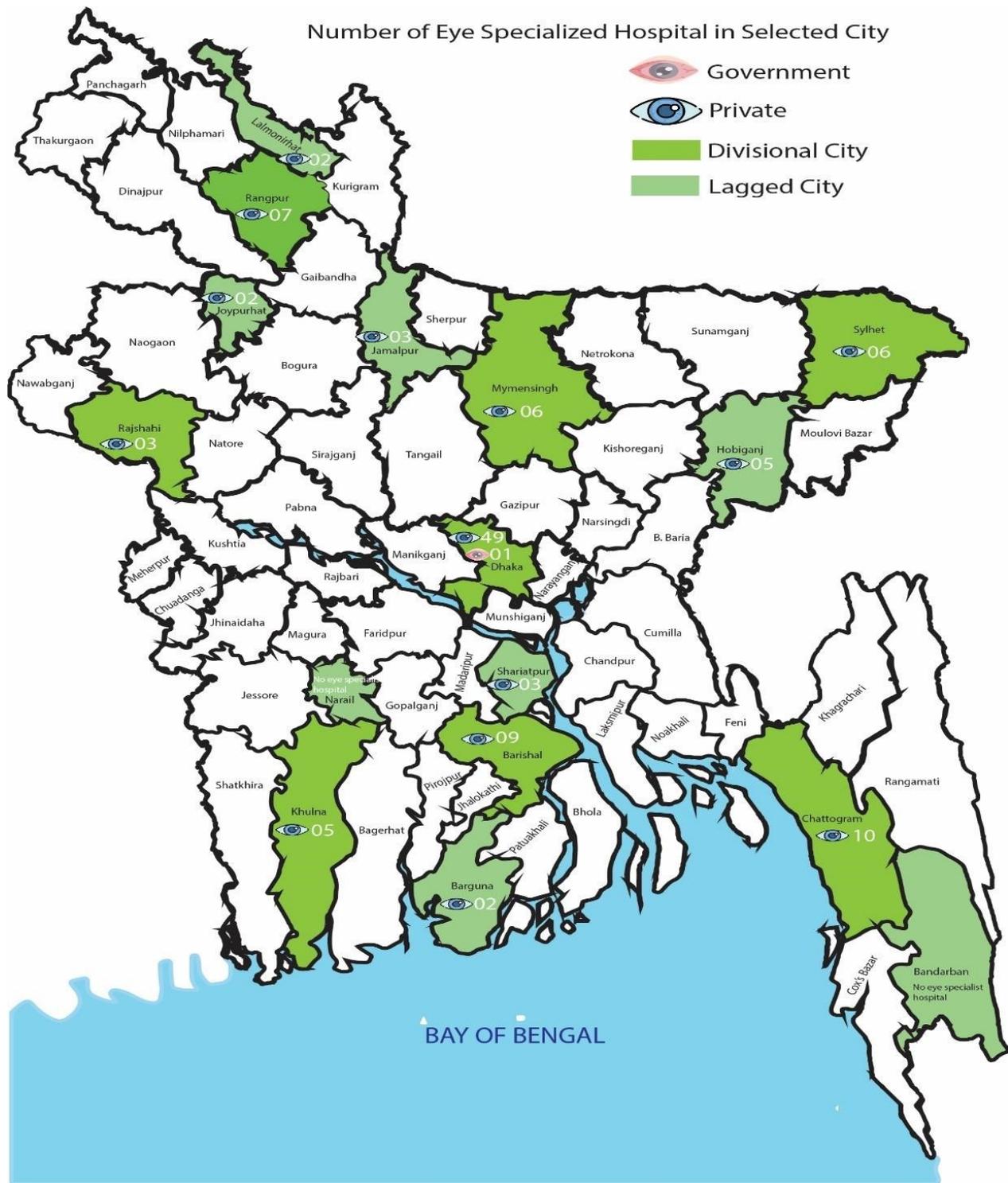
<b>Barishal</b>	11	4	0	4	7	2,570,450
<b>Barguna</b>	5	0	0	0	5	1,010,530
<b>Mymensingh</b>	16	6	2	8	8	5,899,052
<b>Jamalpur</b>	5	0	0	0	5	2,499,737
<b>Sylhet</b>	9	5	2	7	2	3,857,037
<b>Habiganj</b>	2	1	0	1	1	2,358,886

<sup>10</sup> www.seva.org

<sup>11</sup> <https://www.citypopulation.de/en/bangladesh/cities/>

Following map is a representation of available eyecare facilities in the selected regions. All eyecare facilities have at least the diagnosis and testing facility under certified ophthalmologists who attend patient 24/7. However, facilities in remote/rural areas ophthalmologists do not attend patients 24/7, They visit the facilities once or twice a week as per schedule. The eyecare facilities list is added in the appendix.

*Figure 5: Eyecare facilities in the selected regions*



**NGOs working on eye health care in Bangladesh**

There are 1,200 ophthalmologists in Bangladesh. Across the country, 750,000 adults and 48,000 children are living with blindness.<sup>10</sup>

<sup>10</sup> ORBIS BANGLADESH

## The Fred Hollows Foundation

Working in Bangladesh since 2007. Currently working in 24 districts.

### Activity in 2019:

- Screened 446,984 people to diagnose eye problems
- Performed 20,982 eye operations and treatments, including 20,974 cataract operations and 8 diabetic retinopathy treatments
- Distributed 7,605 pairs of glasses
- Trained 810 people, including 7 surgeons, 24 clinic support staff and 779 community health workers
- Educated 29,561 community members in eye health
- Renovated 15 and equipped 16 medical facilities

## Essilor Bangladesh

Designing, manufacturing and distributing quality lens & eyeglass

## Sightsavers Bangladesh

### Activity in 2021:

- Screened more than 835,000 people to diagnose eye problems
- Providing sight tests to check for refractive error and supporting cataract operations to restore vision
- Trained volunteer community health workers

## Orbis Bangladeshblind

Working in Bangladesh since 1985 with Flying Eye Hospital. Orbis focus on eye disease prevention and sight restoration for women, children, and marginalized communities in remote, rural areas. Trained more than 36,000 medical professionals in ophthalmic specialties including pediatric ophthalmology, retina, cataract, glaucoma, and cornea in Bangladesh. Currently working in 28 districts.

### Activity in 2021:

- Screened 374,000 people to diagnose eye problems
- 
- 3,000 eye surgeries performed in hospitals
  - 1,900 trainings for eye care professionals

Vision Centers of Orbis: Orbis set-up of 36 vision centers and four women-led Green Vision Centers in Bangladesh. The vision centers are the primary eye care facilities that connect communities with eye hospitals. Each vision center has a team of ophthalmic personnel, trained to recognize eye diseases, conduct refraction, provide eyeglasses, and refer patients to eye hospitals. Each vision center has a catchment population of around 100,000 people.

## **Symbiosis International (Bangladesh)**

Working in Bangladesh over 20 years in Bangladesh. Symbiosis International implemented a project named The Village Vision project which aim of which is to alleviate poverty by improving health, addressing disability and removing impediments to development such as low vision and blindness.

The Village Vision project objectives are to:

- Facilitate improved quality of life and development participation by treating blindness caused by cataracts
- Support direct costs of providing cataract surgery.

## **Al Basar International Foundation**

Working in Bangladesh since 1992. Al Basar provides the best possible eye care service to patients who cannot afford to attend costly services offered in the private sector specially cataract and other surgeries for poor and disadvantaged patients free of cost. They have 150 eye care professionals including 39 Ophthalmologists, 16 Optometrists, 27 Opticians, 12 Medical Officers and 37 Nurses across the country.

### **Activities:**

- Established 06 Specialized Eye hospitals across the country and served more than 2.5 million patients
- More than 76 camps have already been implemented in different parts of Bangladesh
- **69 Free Eye Camps in 41 District's** (Screened 107,795 people to diagnose eye problems; 37,091 eye surgeries performed; Glasses: 541,848)
- School Program Eye Health (Screened 203,658 students to diagnose eye problems; 55 eye surgeries performed; Glasses: 7,308)
- Specialized Eye Hospitals (Screened 4,221,883 people to diagnose eye problems; 193,741 eye surgeries performed; Glasses: 677,468)

## **Manabik Shahajya Sangstha (MSS)**

Working with eye care since 2011.

### **Activities:**

- Conducted 125 eye camps
- Screened 83,454 people to diagnose eye problems
- 5,815 eye surgeries performed

## **Bangladesh Eye Care Society (BECS)**

Working with eye care since 1988. BECS has established **Glaucoma Research and Eye Hospital** for over two decades – only such specialized hospital for treatments of Glaucoma in the country.

BRAC

BRAC constructed (Partial funded by Orbis International) more than 20 vision centers with the aim of ensure quality eye care services for the ultra-poor through telemedicine technology. Furthermore, the middle class also received eye check-up, registration, necessary suggestions and treatments at reasonable costs.

### **Community Vision Center (National Eye Care)**

A project of the National Institute of Ophthalmology & Hospital, Department of Health, the government of the People's Republic of Bangladesh

Community Vision Center is an activity of the National Eye Care Operational Plan under the Fourth Health, Population, and Nutrition Sector Program of the Ministry of Health and Family Welfare. It is an ongoing program to provide free integrated advanced eye care at the doorsteps of marginalized communities using video conferencing and modern technology to connect the Community Vision Centers in the Upazila Health Complex adjacent to the base Center (Medical College Hospital/Specialized Hospital). The goal of Community Vision Center is *Free integrated advanced eye care services at the doorsteps of marginalized communities using digital technology.*

#### **Base center**

- Medical college hospitals or specialized hospitals with trained ophthalmologists and modern ophthalmic investigation, treatment, and operation services.
- 15 to 20 Community Vision Centers are located 20 to 90 kilometers around the base center.
- Base Center's multiple ophthalmologists provide outpatient care through video consultation with trained ophthalmic nurses and patients at the Community Vision Center.

#### **Services of Vision Center**

- Providing comprehensive advanced eye care services including primary eye care services.
- Diagnosis of other complex eye diseases including cataracts, glaucoma, diabetes retinopathy, eye injury, and pediatric ophthalmology.
- Ensure eye treatment services including operations and necessary investigations of patients on referral with the advice of an Ophthalmologist working at Base Center through teleconsultation.
- Provision of spectacles with free medicines under government management.
- There is no operation facility in the center.

#### **Medical Services Procedures of Community Vision Center**

Before prescribing eye care, the community vision center nurse communicates with the Base Center ophthalmologist through video conference. The Ophthalmologist located at the Base Center issues the prescription with the necessary e-signature and the issued prescription is printed out on the printer of the Community Vision Center. According to the prescription, the nurse handed over free medicines and spectacles from the community vision center to the patient. Nurses working at Community Vision Centers do not administer prescriptions to patients themselves.

Figure 6: Medical Services Procedures of Community Vision Center



### Formation of Community Vision Centre

- One room in Upazila Health Complex has been allotted for Community Vision Center.
- The room has been modernized with essential furniture and high-quality optical equipment.
- Equipment includes slit lamps, auto refractometers, diabetic retinopathy, fundus cameras for diagnosing glaucoma, eye pressure measuring instruments, and ophthalmoscopes.
- Internet connectivity is established through Bangladesh Telecommunications Company Limited (BTCL).
- Along these, the setup includes the essential accessories of a chamber i.e., Digital Vision Chart, Glucometer, Medicines, and Spectacles.

### Human Resource of Community Vision Centre

- Each center has two ophthalmology-trained nurses engaged in providing eye care.
- Nurses are given 4 months of training in ophthalmology (2 months at the National Institute of Ophthalmology & Hospital and 2 months at Aravind Eye Hospital in India).

- A Senior Medical Officer working in the Upazila Health Complex is engaged in the overall supervision of the Community Vision Centre.
- Health assistants and family welfare inspectors working in the Upazila health complex encourage eye patients in rural areas to take the services of the community vision center.

## 1.2 Number of Patients

Eye specialists say that spending long hours staring at a mobile phone or computer screen is pushing up myopia, or short sightedness, while a pandemic-led prolonged home stay and lack of physical activities are contributing to diabetes and high blood pressure even among the young in the country. At least 6 million people, including 1.3 million children, suffer from refractive errors preventing them from effectively participating in day-to-day activities in Bangladesh.<sup>11</sup>

The survey team of NewVision Solutions Ltd talked with the patients of both outdoor and admitted patients of the eyecare facilities of the pre-selected districts. However, the patients were chosen randomly. Most patients in the public provided facilities belong to a lower income group. The patients of private sector are usually from upper-middle class of income but depending on the severity of disease and case people from lower income group were also seen.

According to Seva Foundation's (an international non-profit health organization based in Berkeley, California) Bangladesh Fact Sheet, a total of 948,295, i.e., 0.59% of Bangladesh's population is blind as of 2021. 4.64% of the population has moderate to severe vision impairment or MSVI (7,478,869) as compared

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to 2.2% of global blindness<sup>12</sup>. Most of those living with blindness have cataracts, due to poor nutrition and lack of vitamin A, and surgical intervention is essential to prevent irreversible loss of sight, especially in children (Coates, 2020).

The national cataract surgical rate (CSR) is estimated at 2600 per million populations per year in Bangladesh.<sup>13</sup> Around 1.5 million children in Bangladesh are suffering from low vision, which can be avoided through intervention while around 250,000 people in Bangladesh risk losing eyesight because of diabetic retinopathy<sup>14</sup>. The health directorate said more than 200,00 people availed eye treatment in 2020 (TBS, 2021).

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<sup>11</sup> <https://www.dotglasses.org/bangladesh/>

<sup>12</sup> Seva Foundation, 2021. Bangladesh Fact Sheet. seva.org

<sup>13</sup> Hussain E., Husain L., Roy A., et al. 2022. Assessment of eye health care services of Bangladesh using eye care service assessment tools. International Journal of Research in Medical Sciences. DOI: <https://dx.doi.org/10.18203/2320-6012.ijrms20220275>.

<sup>14</sup> Dhaka Tribune, 2018. <https://archive.dhakatribune.com/bangladesh/2018/10/12/experts-750-000-peoplesufferfrom-blindness-in-bangladesh>

Table 7: Distribution of number of cataract surgery by divisions and type of facility in Bangladesh (2019)

Division	Public	Private	NGO	Total (%)
Dhaka	27,835	49,457	81,288	158,580 (37.5)
Barisal	388	565	14,964	15,917 (3.8)
Khulna	2127	8416	41,781	52,324 (12.4)
Sylhet	543	7523	19560	27,626 (6.5)
Rajshahi	1331	5274	31862	38,467 (9.1)
Rangpur	1732	8236	35,801	45,769 (10.8)
Chattogram	1521	8443	51,510	61,474 (14.5)
Mymensingh	2355	7127	13266	22,748 (5.4)
<b>Total (%)</b>	<b>37,832 (9)</b>	<b>95,041 (22)</b>	<b>290,032 (69)</b>	<b>422,905 (100)</b>

Source: Hussain et al., 2022

National Eye Care Bangladesh's nationwide survey conducted in 2013 was carried out in the adult population aged 40 and older. This nationally representative population-based survey indicates that more than 1 in 10 Bangladeshi adults aged  $\geq 40$  years have low vision or blindness, with cataract being the single most attributing factor. The mean age was 54.3 years. Among 6,391 participants, the rate of blindness was higher in females (53.8%) and the rural population (69.9%)<sup>15</sup>.

The first study conducted by Hussain et al. (2022) in Bangladesh using the WHO-recommended ECSAT tool found that at least 3,000 CSR per year per 1 million people are needed to control blindness due to cataract.

According to a study conducted by the UK-based International Centre for Eye Health (ICEH), there were more than 40,000 blind children in Bangladesh more than a decade ago. Another survey has revealed that around 1.0 million Bangladeshi children below 6 years of age are the victims of nutritional blindness while more than 30,000 children fall victim to night blindness per year.<sup>18</sup>

The CIPRB (Centre for Injury Prevention and Research, Bangladesh) with technical and financial support from the National Eye Care, conducted a survey titled "Nationwide Blindness Survey 2020" during

November 2020 - January 2021 over 18,810 participants from both urban and rural areas of all 64 districts. The survey showed that the current blindness rate in Bangladesh is 1% representing 534,000 people. The survey report elaborated that 1 out of every 100 people over the age of 30 in the country is blind. The rate of blindness is dropped by 35% over the past 20 years, according to the survey. A total of 19% of the population aged 30 and above still suffers from different types of visual problems, while the global rate of such cases is 30%, the report said.<sup>16</sup>

Interestingly, experts believe that around 80% blindness is avoidable by intervention (Dhaka Tribune, 2018).

<sup>15</sup> Shakoore, Rahman, Hossain. 2022. Prevalence of blindness and its determinants in Bangladeshi adult population: results from a national cross-sectional survey. *BMJ Open*. <https://bmjopen.bmj.com/content/12/4/e052247.full> <sup>18</sup> Financial Express, 2017. <https://thefinancialexpress.com.bd/health/many-children-in-bd-suffer-fromeyesightproblems-1502770815>

<sup>16</sup> The Business Standard (TBS), December 2021. <https://www.tbsnews.net/bangladesh/blindness-rate-falls-3520years-survey-341074>

## National Institute of Ophthalmology (NIO)

National Institute of Ophthalmology (NIO) is one of the largest specialized public eye health facilities in Bangladesh for Ophthalmology and eye care. Below are the patient statistics as per the Local Bulletin 2022 by NIO:

Table 8: Number of OPD & emergency visits, admissions & deaths in 2021 at NIO (Upazila: Sher-ebangla Nagar, District: Dhaka, Division: Dhaka)

Health Facility Type	OPD visits (Year 2021)								
	Male (Age <= 5)	Female (Age <= 5)	Total	Male (Age > 5)	Female (Age > 5)	Total	Grand-Total		
							Male	Female	Both
Tertiary Hospital	3,185	4,390	7,575	135,503	107,372	242,875	138,688	111,762	250,450
Emergency visits (Year 2021)									
Tertiary Hospital	292	127	419	2,441	723	3,164	2,733	850	3,583
Admissions (Year 2021)									
Tertiary Hospital	557	321	878	7,125	6,765	13,890	7,682	7,086	14,768
In Patient deaths (Year 2021)									
Tertiary Hospital	0	0	0	0	0	0	0	0	0

Source: Local Health Bulletin – 2022, NIO

Table 9: Different factor Statistics for National Institute of Ophthalmology (NIO) (As of 2018)

Health Facility	Outpatient, emergency and inpatient attendances at NIO, 2018								
	OPD visit		Emergency visit		Inpatient		Grand-Total		
	Female	Male	Female	Male	Female	Male	OPD F+M	Emergency F+M	Inpatient F+M
NIO	174,771	214,161	2,422	4,052	7,019	8,463	388,932	6,474	15,482
Average length of stay (ALS) at NIO, 2018									
	Hours/ Day		Hours/ Month		Hours/Year		Days/Year		
NIO	3.8		114		1,387		58		
Bed-occupancy rate (BOR) and number of major & minor surgeries performed at NIO, 2018									
	BOR (%)		No. of sanctioned beds		No. of Major Surgery		No. of Minor Surgery		

NIO	66	250	13,970	1,476
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Source: Health Bulletin, 2019 (MoHFW, GoB)

### 1.3 Average treatment cost

The doctor visiting fees at the state-run eye hospitals such as National Institute of Ophthalmology and Hospital (NIOH) vary from BDT 10 only (\$0.097) to \$0.29 (Tk 30) and the prescription fees at the private eye hospitals vary from \$5.15 to \$20.62 per visit. Different eye tests and surgeries are also available in low costs at the public hospitals, while these are costly at private hospitals. Surgery costs include pre-operation and post-operation hospital stay, cost of screening tests needed for surgery, lens (if needed), operation theatre charge, etc. Expenses for cataract surgery generally range between \$515.5 to \$1031 at the private hospitals with lens.<sup>17</sup> For surgery, people often look into a combination of indicators like actual results, affordability, distance, and recommendation of healthcare personnel.

Moreover, during the field visit consultant found that the cost of treatment of government provided services is the same in all parts of the country. Prior to the availability of seats patients are admitted to hospitals and treated with free cost. There are beds which can be rented also, where the cost per day is as low as BDT 225 (\$2.18). In both cases the patient is provided with everything required during his/her stay in the hospital. For a surgery, a patient needs to stay in hospital for 3/4 days. But a patient must bear the costs of different medical tests required in the process. Also, cases were seen where the patients had to buy medicines as the government provided supply was out of stock.

On the other hand, the cost of private services varies with the reputation and quality of service provided by the organization. The profile of concerned ophthalmologists, quality of lens (if required) and type of technology play a huge part in the determination of cost incurred in the process. The survey team of NewVision Solutions Ltd visited private eye care centers in the pre-selected districts and tried to find out the cost of common diseases.

The cost of one session with a consultant in private sector is a wide range depending on the facility. But the lowest cost for a session we found was BDT 100 (\$0.97).

While researching on the specific diseases, Glaucoma is a long-term disease and patients need to follow up three to four times annually. They have to spend up to \$618.6 per year for treatment in private hospitals, where a patient has to buy eye drops worth at least \$10.31 to \$16 per month and poor patients cannot afford such drops. Glaucoma is a disease that leads to irreversible blindness while the most common type of glaucoma is congenital or hereditary.<sup>18</sup>

Below is the cost chart for different eye tests and eye disease treatments:

Table 10: Eye Treatment costs at Ispahani Islamia Eye Institute (IEI&H) and Hospital (NGO) <sup>19</sup>

Name of Items	Cost (BDT)	Cost (USD)
Doctor's Visiting Fee - outdoor (per visit)	100	.97
<b>Cabin rent per day:</b>		
Single cabin	2,000	19.44

<sup>17</sup> <https://businesspostbd.com/front/from-screening-to-eye-surgery-it-costs-tk-10-at-nio-hospital-2022-05-21>

<sup>18</sup> The Independent, 2018. <https://m.theindependentbd.com/printversion/details/176540> <sup>19</sup>

<https://www.islamia.org.bd/>

Double Cabin	3,000	29.16
Ordinary bed	300	2.91
<b>Diagnosis/ Tests:</b>		
Pre-Lasik	3,000	29.16
Humphrey	1,200	11.661
CEC	3,000	29.16
FFA	3,000	29.16
ECG	610	5.9
Amsler grid	800	7.77

CCT	650	6.31
Blood	260	2.52
OCT	550	5.34
Urine	220	2.13
<b>Operation/ Surgery Cost:</b>		
Cataract	20,000	194.45
DCR	8,000	77.78
Cornea	9,000	87.50
Retina	12,000	116.67
Orbit	10,000	97.22
Ophthalmic Trauma	7,000	68.06

*Table 11: Eye surgery costs at Harun Eye Foundation Hospital (Private)<sup>19</sup>*

Items	Eye	Charges (BDT)	Charges (USD)
<b>Pre-Lasik Test</b>	Both Eyes	4,000	38.89
<b>Conventional Lasik</b>	One Eye	25,000	243.07
<b>Conventional Lasik</b>	Both Eyes	50,000	486.14
<b>Stream light PRK</b>	One Eye	33,000	320.85
<b>Stream light PRK</b>	Both Eyes	66,000	641.71
<b>T-PRK</b>	One Eye	25,000	243.07
<b>T-PRK</b>	Both Eyes	50,000	486.14
<b>Femto Lasik</b>	One Eye	49,000	476.42
<b>Femto Lasik</b>	Both Eyes	98,000	952.84
<b>Femto DLK</b>	One Eye	25,000	243.07

See the detailed table of different eye investigation rates at Harun Eye Foundation Hospital at [Appendix 1](#).

<sup>19</sup> <http://hefh.infocarebd.com/lasik-surgery-cost/>

Table 12: Bangladesh Eye Hospital (Private) eye surgery costs<sup>20</sup>

Items	Cost (BDT)	Cost (USD)
<b>PRK (Both eyes)</b>	55,000	534.75
<b>PRK (One eyes)</b>	28,000	272.24
<b>PTK (Both Eyes)</b>	40,000	388.91
<b>PTK (One eye)</b>	20,000	194.45
<b>For Lasik:</b>		
<b>Pre-Lasik Test</b>	5,000	48.61
<b>Lasik Surgery (Both eyes)</b>	50,000	486.14
<b>Lasik Surgery (One eye)</b>	25,000	243.072

Comparison table for costs at different hospitals:

Table 13: Surgery cost comparison table

Items	Bangladesh Eye Hospital (Private) – in USD	Harun Eye Foundation Hospital (Private) – in USD	Ispahani Islamia Eye Institute (IEI&H) and Hospital (NGO – in USD)	National Institute of Ophthalmology (Public) – in USD
<b>For PRK:</b>				
T-PRK (Both eyes)	567	515	*	Free of Cost
T-PRK (One eyes)	289	258	*	Free of Cost
PTK (Both Eyes)	412	*	*	Free of Cost
PTK (One eye)	206	*	*	Free of Cost
<b>For LASIK:</b>				
Pre-Lasik Test (Both eyes)	52	41	31	
Lasik Surgery (Both eyes)	515	515	*	
Lasik Surgery (One eye)	258	258	*	
<b>Cataract Surgery</b>	*	*	206	

**Note:** All the ‘\*’ means data were not for these items. The Consultant will try to collect data for these items at the time of the Primary Survey.

<sup>20</sup> <https://bangladeshplease.wordpress.com/2017/01/25/eye-treatment-cost-in-bangladesh/>

A tabular representation is stated below for a better understanding of the scenario of costs of ophthalmic services across different locations of Bangladesh.

*Table 14: Costs of surgery of common diseases <sup>21</sup> \*\*\**

Figures are in USD (\$1=102.85 BDT)

District	Cataract		DCR	Trab MMC	Retina	DCT	Pterygium
	SICS	Phaco					
<b>Dhaka</b>	196-1,500		588-600		490-685	50-295	
<b>Shariatpur</b>							
<b>Mymensingh</b>	78- 194	194-389	49-194	**	**	58-97	78-194
<b>Jamalpur</b>	34-340	**	**	**	**	**	**
<b>Rajshahi</b>	44	78-1,507	437	48	437	**	**
<b>Joypuhaat</b>	39-389		35	**	**	25	**
<b>Rangpur</b>	40	90-700	**	**	**	**	**
<b>Lalmonirhaat</b>	24	38-45	39	**	**	19	**
<b>Sylhet</b>	**	438-486	146-194	**	**	**	**
<b>Habiganj</b>	**	39-107	68	**	**	49	**
<b>Chittagong</b>	**	39-321	58	58	340	**	39-78
<b>Bandarban</b>	**	68-97	68	**	**	39	39-68
<b>Barishal</b>	98-952	126-972	48-68	**	**	19-38	**

<sup>21</sup> Primary Survey of NewVision Solutions Ltd

<b>Barguna</b>	49-583	97-145	**	**	48-145	38-77
<b>Khulna</b>	292-778	136-233	155-194		136-233	**
<b>Narail</b>	Surgery not available					

**Note: \*\* Mark is an indicator of unavailable information**

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In case of major or complex surgery patients are mostly referred to divisional facilities or specialized facilities.



**EYEGLOSS & CONTACT  
LENS MARKET IN**

## Chapter 2: Eyeglass & Contact Lens Market

### 2.1 Overview

Bangladesh Eyewear Market is expected to register growth on the back of increasing instances of vision disorders which is leading to increased adoption of eyeglasses. Moreover, the rising adoption of eyewear products as fashion accessories is further, anticipated to boost the growth of the Bangladesh eyewear market in the coming years. The Eyewear market covers unmounted Spectacle Lenses, Sunglasses, frames for spectacles, and Contact Lenses for private end consumers, excluding protective eyewear and safety glasses.

The spectacles and other accessories market is completely import dependent. Although there are a few manufacturers who make plastic spectacles, their production is less than 2% of total demand. About 90% of spectacles imported into the country come from China. Apart from that, spectacles are also imported from South Korea, Italy, France, Germany, India and Thailand.

Based on items, the eyeglasses area of the general Bangladesh eyewear market is supposed to observe the most elevated development during the projected period 2020-26 upheld by rising openness of the populace towards PCs, cell phones, and tablets which is prompting an expansion in the eye-related deserts and is adding to expanded reception of contact glasses. The buying cost of eyeglasses is a lot of lower than delicate contact focal points and is subsequently, expected to drive huge interest projections for eyeglasses in Bangladesh soon.

Patients who need to buy lenses for the purpose of surgery tend to buy them from the ophthalmology clinics as a package (cost of surgery, facility cost, and cost of lens altogether). ophthalmology clinics procure them through their own channel of procurement (different medical representatives and brand representatives).

Patients who require such lenses but not for surgery (replacement of glasses), they tend to buy them from eyewear shops upon pre-order. People who use lenses instead of eyeglasses tend to buy lenses based on price and quality. Patients who need to buy lenses for case of surgery tend to buy so after judging the actual result and recommendations of healthcare facilities.

So, lenses for surgery are mostly sold by ophthalmology clinics and Lenses required as replacement of eyewear glass are mostly sold by shops.

In Bangladesh, Soft lenses are the most frequently used. Hard lenses are used by people only who are prescribed to do so by a certified ophthalmologist. (Major complexion)

Table 15: Percentage of usages of lenses based on duration

Category	Percentage	Remarks
<b>1 day</b>	10%	Less Common
<b>1 Week</b>		
<b>2 Weeks</b>		
<b>1 Month</b>		
<b>1 Year</b>	90%	More Common

Source: NVSL Primary Survey

While visiting the selected districts, the survey team found that the share of fashion lenses in eyewear stores is more. However, many of the shops sell power lenses upon the pre-requisition of consumers. But the share of such is as low as one pair per month.

### 2.2 Eyeglass & Contact Lens: Market Size

Bangladesh's market size for spectacles or eyeglasses stood at \$308 million and the contact lens market size stood at 28 million in 2021, according to Statista, a German company specializing in market and consumer data.

On the other hand, as per the traders in Patuatuli, Old Dhaka, the eyeglass market size is \$118 million (Tk 1,000 crore) as of mid-March 2021 and it has been witnessing a 10% growth per year due to increasing vision disorders prompted by long screen time, diabetes and hypertension. Shifting consumer megatrends, transforming market structures and technological innovations are also the key drivers of this growth. The traders think China is the most efficient in making eyeglasses as they can provide spectacles as per the traders’ budgets and requirements regardless of low prices. Apart from the cheap rate of Chinese glasses, the import process of the items is very smooth, which helps keep the country's eyewear market totally import dependent. Traders mostly import plastic frames, reading frames, glass and screws of glasses. Due to the tariff structure on raw materials, spectacles making in the country is costly.<sup>22</sup>

Apart from Patuatuli, there are more than 10,000 glass traders across the country, with more than 100,000 people involved in the industry directly or indirectly. According to the Bangladesh Optical Industries and Traders Association (BOITA), the association has 250 registered members while there are more 5,000 eyewear shops across the country. On top of this, there are 50 importers who bring in glass frames and other accessories.<sup>23</sup>

Figure 7: Eyeglass market at a glance<sup>24</sup>

	Market size	\$103.1 Million
	10%	annual growth
<b>Eyeglass/</b>	500 shops in Patuatuli, Dhaka	Old
<b>Spectacle</b>	10,000 traders	
<b>Market</b>	90% import from China	
	50 importers	

Below are the key insights from Statista analysis:

- Revenue in the Eyewear market (contact lens, spectacles, eyewear frames, sunglasses) amounted to \$679.5 million in 2021. The market is expected to grow annually by 9.52% (CAGR 2022-2025).
- The market's largest segment is the Spectacle Lenses with a market volume of \$308 million in 2021.
- In relation to total population Figures, per person revenues of US\$4.55 are generated in 2022.
- In the Eyewear market, volume is expected to amount to 67.9 million pieces by 2025. The Eyewear market is expected to show a volume growth of 6.4% in 2023 (Statista).
- The average volume per person in the Eyewear market is expected to amount to 0.4 pieces in 2022.

<sup>22</sup> The Business Standard, 2021. <https://www.tbsnews.net/economy/industry/spectacular-growth-spectaclesmarket->

<sup>23</sup> The Business Standard, 2021. <https://www.tbsnews.net/economy/industry/spectacular-growth-spectaclesmarket->

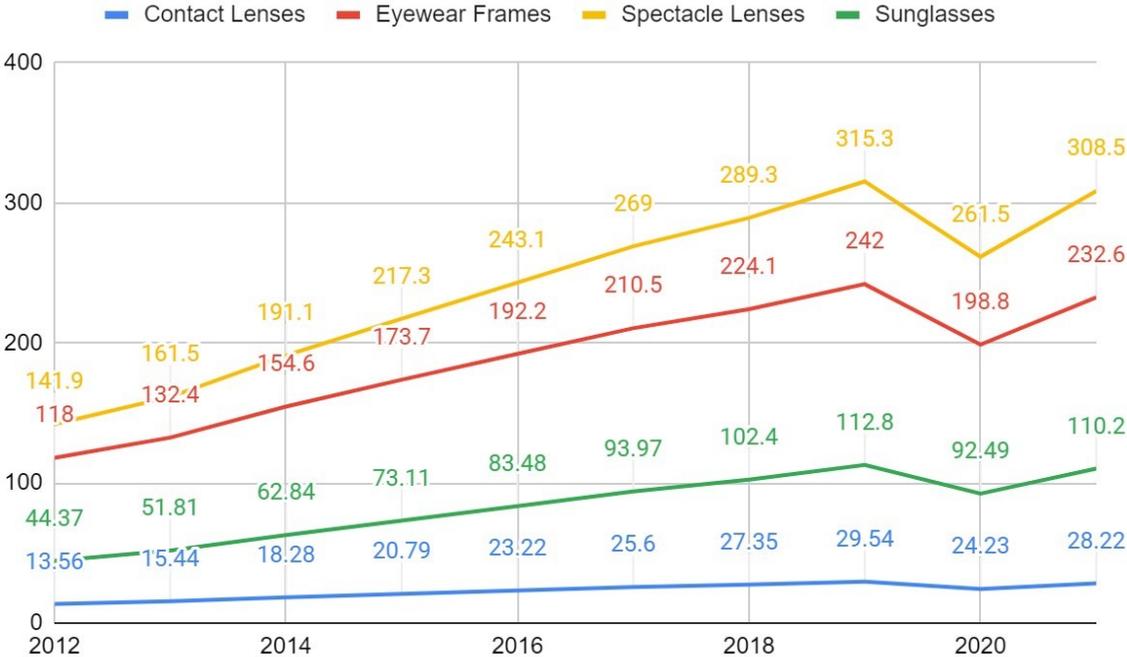
<sup>24</sup> The Business Standard, 2021. <https://www.tbsnews.net/economy/industry/spectacular-growth-spectaclesmarket->

According to the data from Statista, the following sections have been developed to give an overview of the market size of the eyewear market in Bangladesh. Independent forecast after 2022 (June) up to 2025, has been made by Statista regarding market developments of the global Eyewear industry. The launch of eye-friendly contact lenses that provide comfort and freedom to carry day-long activities coupled with an increase in the geriatric population with age-related eye vision problems are expected to drive considerable demand projections for eyewear products in Bangladesh in the upcoming six years.

**Revenue by Segment**

The revenue by segment trend is illustrated below

*Figure 8: Eyewear market revenue by segment in Bangladesh (in Million USD)*



Source: Statista

Note: Data shown is using current exchange rates and reflects market impacts of the Russia-Ukraine war. Update as of June 2022.

**Offline Marketplaces:**

Most of the eyewear large marketplaces are concentrated in Dhaka. Below are some of the mentionable marketplaces in Dhaka:

**Patuatuli:** Patuatuli had its first shop "Kamal Optics" in 1948, and the biggest wholesale spectacles hub in Bangladesh. It now has more than 500 eyewear shops.<sup>25</sup>

<sup>25</sup> The Business Standard, 2021. <https://www.tbsnews.net/economy/industry/spectacular-growth-spectaclesmarket->

**DCC Market:** Standing in Gulshan 2, DNCC (Dhaka North City Corporation) or DCC Super Market has a cluster of eyewear shops. Cure Optics (shop #G-4) is among the mentionable shops that holds a vast arsenal of frames, offering something for most facial shapes.

**Bashundhara City Shopping Complex:** The Level 5 of Bashundhara City shopping complex has caused numerous glass stores to team up. Encouraging anti-reflective coating in eyewear, Eye Vision and Ray Ban Exclusive are mentionable shops here among many.<sup>26</sup>

**New Market:** There are lanes of small, medium and large eyewear stores at regular intervals on either side of New Market with a wide array for the shopper on a budget.

**Mohammadpur:** Another mentionable area to offer a marketplace where many small and large spectacle stores are situated.

### Best Optical Shops in Bangladesh

Table 16: List of best shops<sup>27</sup>:

Name of Shop	District
Luxotix	Dhaka
M/S. Eye Glasses	Sylhet
Upohar2Me	Dhaka
Fashion Optics	Dhaka, Munshiganj, Chattogram
Chashma Ghar	Dhaka
Lexus Vision Care	Dhaka
Akram Traders	Dhaka
New Mullick Optics	Dhaka
Paradise Optical Co.	Dhaka
Jewel Optics	Dhaka
Bangladesh Optical	Chattogram

Besides, Dunhill optics, Kahinur optics, Anika monika optics, Wester vision, Westar optics, New eye fashion Optics media, Jubaer optics & watch, Eye land, France optics and Eye vision are the top ranked eyewear shops at Gulshan, the posh area of Dhaka City.<sup>28</sup>

### Retail Chains

There are only a few retail chains in the eyewear market of Bangladesh. NewVision Solutions Research Team has found only three retail chains existing based on secondary research.

Table 17: List of major retail chain shops

Name of Retail Chain	District Coverage	Number of Outlets
Fashion Optics	Dhaka	14
	Chattogram	1
	Munshiganj	1

<sup>26</sup> The Daily Star, 2022. <https://www.thedailystar.net/lifestyle/shop-talk/places-eyewear-1520215>

<sup>27</sup> [https://www.bangladeshyp.com/category/Optical\\_shop/](https://www.bangladeshyp.com/category/Optical_shop/)

<sup>28</sup> <https://gulshan.infoisinfo.com.bd/search/eyewear>

Jewel Optics	Dhaka	7
Luxotix	Dhaka	2

### Online Marketplaces:

Table 18: List of top eyewear online marketplaces

Name of Company/ Marketplace	Website
NineOptic	<a href="https://nineoptic.com/">https://nineoptic.com/</a>
Lunettes Bangladesh	<a href="https://lunettes.com.bd/">https://lunettes.com.bd/</a>
GlassBD	<a href="https://glassesbd.com/">https://glassesbd.com/</a>
Beauty Opticals	<a href="http://beauty-opticals.com/">http://beauty-opticals.com/</a>
Luxotix	<a href="https://www.luxotix.com/">https://www.luxotix.com/</a>

Luxury Eyesight	<a href="https://www.luxuryeyesite.com/bangladesh/">https://www.luxuryeyesite.com/bangladesh/</a>
Opal Fashion Wear	<a href="https://opal-fashionwear.com/productcategory/eyewear/?v=87a47565be47">https://opal-fashionwear.com/productcategory/eyewear/?v=87a47565be47</a>
Daraz	<a href="https://www.daraz.com.bd/eyeglasses/">https://www.daraz.com.bd/eyeglasses/</a>

### Foreign Company Outlets in Bangladesh

Table 19: List of top Foreign Company Outlets in Bangladesh

Name of Company	Based In	Outlet
Vision Care Optical Bangladesh Pvt Ltd	Sri Lanka	Banani, Dhaka
Luxury Eyesight	Chicago, USA	Online
Essilor	France	Gulshan & Banani, Dhaka

## 2.3 Pricing

Prescription lenses (eyeglass) are mainly of two types such as Anti Blue Lenses and Anti Reflected Lenses apart from the regular one and the prices vary from \$4.12 to \$43.3 varying from shop to shop.

Table 20: Average retail price of contact lenses (figure in USD)

Type of Lenses	Brand Name	Price with Power (1 Pair)	Power without Power (1 Pair)
Bausch and Lomb Color	Bausch + Lomb (Made in USA)	18.38	15.46
AQUA SOFT Color	Aqua Soft (Made in Netherlands)	18.38	15.46

Gelflex Color	Gelflex (Made in Australia)	17.4	16.43
ColourVue Color	ColourVue (Made in Malaysia)	16.43	14.49
Acme 55 Color	ACME (Made in Korea)	19.35	14.49
Pure Black Color	Aqua Soft (Made in Netherlands)	N/A	15.46
	Bausch + Lomb	N/A	16.43
Plus Power Color	Aqua Soft (Made in Netherlands)	38.79	N/A
Cylinder / Toric Power Colo	Aqua Soft (Made in India/Taiwan)	77.78	N/A
	Bausch and Lomb (Made in USA/Ireland)	87.51	N/A

Source: NVSL Primary Survey

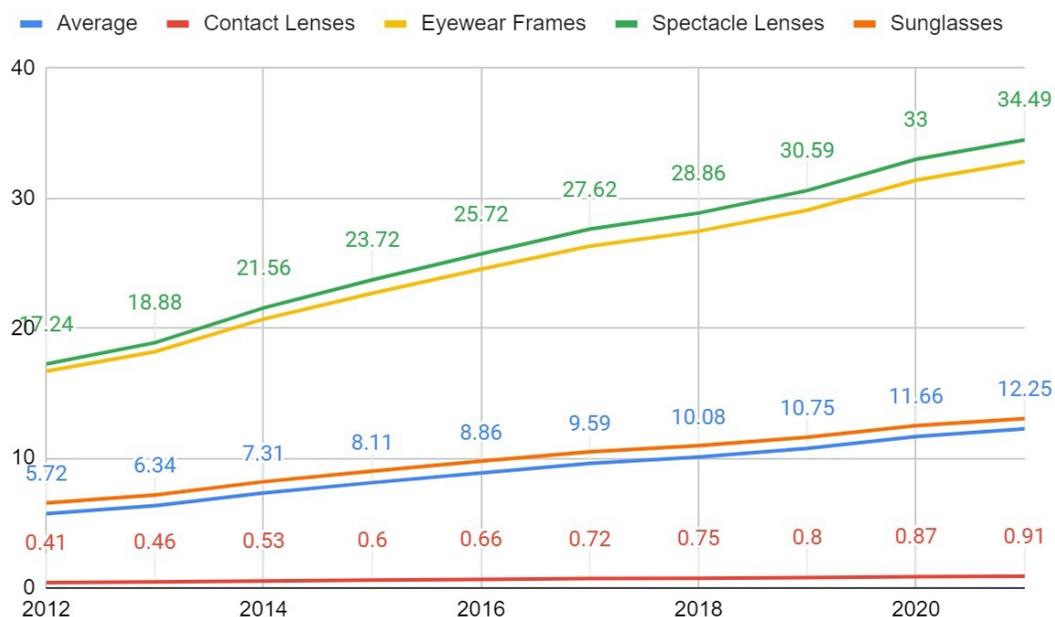
Table 21: Average retail price of eye glasses (figure in USD)

Type of Eye Glasses	Average Price (Without frame)
Anti Blue Glass	1.94-3.40
Anti Reflected Glass	1.45-2.43
Regular White Glass	0.97-1.45

Source: NVSL Primary Survey

Beside the shops, many eye care hospitals in Bangladesh have their own eyewear shops inside the clinic. Patients often tend to buy corrective glasses from those shops because of the predetermined idea of them being the right service providers. However, people with access to correct information seem to buy from elsewhere (nearby local shops). Also, while purchasing the glass for the second or third time( In case of damage) people often buy from their locality.

Figure 9: Average annual price per unit (in Million USD)



Source: Statista

## 2.4 Tariff & Duty

The NBR's (National Board of Revenue) revenue collection data revealed a massive eyewear black market. The revenue board earned \$10.62 million in the 2019-20 fiscal year after identifying the 40 illegal traders. Earnings in the previous year amounted to only \$1.55 million. The NBR collected \$5.57 million only from value-added tax (VAT) until January of FY 2019-20. Spectacle lenses are usually out of VAT while traders pay 15% VAT for regular glasses.

Below is the list of TTI rates for different eyewear good import:

Table 22: National Operative Tariff for Spectacles, Optical glasses and Contact Lens in Bangladesh<sup>29</sup>

HS Code	Description	Total Incidence (TTI)	Tax UNIT
70140000	Signalling Glassware and Optical Elements of Glass, Not Optically Worked	37%	KGM
70151000	Glasses For Corrective Spectacles, Not Optically Worked	31%	KGM
70159000	Clock Or Watch Glasses, Glass for Non-Corrective Spectacles, Etc	31%	KGM
90013000	Contact Lenses	37%	NMB
90014000	Spectacle Lenses of Glass	37%	NMB
90015000	Spectacle Lenses (Excl. Of Glass)	31%	NMB
90019090	Other Prisms, Mirrors and Other Optical Elements, Unmounted, Nes	37%	KGM
90031100	Frames And Mountings for Spectacles, Goggles or The Like, Of Plastics, TV	73.96%	NMB
90031900	Frames And Mountings for Spectacles, Goggles or The Like, Nes, TV	73.96%	NMB
<b>Optical/ photographic devices</b>			
90063000	Cameras For Underwater Use, For Aerial Survey, For Medical Purposes	37%	NMB
90138010	Optical devices, appliances and instruments, nes	31%	NMB
90139010	Parts And Accessories of Lasers and Optical Devices, Nes, Of 90.13	31%	KGM
90021100	Mounted Objective Lenses, Of Any Material, For Cameras, Projectors, Etc	37%	
90185000	Other Ophthalmic Instruments and Appliances	26.20%	KGM
90071010	Cameras For film of less than 16 mm width or for double-8 mm film:	37%	NMB
90111000	Stereoscopic Microscopes	26.20%	NMB
90112000	Optical Microscopes, For Microphotography or Microprojection	26.20%	KGM

<sup>29</sup> Bangladesh Customs. Duty Calculator.

[http://bangladeshcustoms.gov.bd/trade\\_info/duty\\_calculator?hscode=90031900](http://bangladeshcustoms.gov.bd/trade_info/duty_calculator?hscode=90031900) <sup>34</sup>

See [List of Acronyms](#).

90118000	Other Optical Microscopes, Nes	26.20%	NMB
90119000	Parts And Accessories of Optical Microscopes Of 90.11	26.20%	NMB
90121000	Microscopes (Excl. Optical Microscopes) And Diffraction Apparatus	26.20%	NMB
90129000	Parts And Accessories of Microscopes and Diffraction Apparatus Of 90.12	26.20%	NMB

Source: Bangladesh Customs, Duty Calculator

Note: KGM – Kilogram, NMB – Number. The result shows the total tax incidence (TTI) where one needs to multiply this rate by the assessable value (AV) to obtain total amount of duty and taxes. The TTI includes CD, SD, RD, AIT, VAT and ATV<sup>34</sup>.

Roughly, the total import duties reach 74% for frames and 31% for corrective lenses in Bangladesh.

The manufacture, import and sales of Medical Devices are regulated under the Drugs Act, 1940 and Drug (Control) Ordinance 1982 & Drugs Rules (see details in [Appendix 1](#))<sup>30</sup> in Bangladesh.

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<sup>30</sup> Alam K. 2017. Medical Device Registration in Bangladesh.

<https://www.linkedin.com/pulse/medicaldeviceregistration-bangladesh-kazi-neamat-farjanal-alam/>



## PATIENT FLOW & SPECIAL

## CHARACTERISTICS

### Chapter 3: Patient Flow & Special Characteristics

#### 3.1 Overview

Patient flow is the moving of patients within a healthcare facility. It involves medical care, resources, decision-making, and internal systems in place. Optimizing patient flow is critical for healthcare facilities for two main reasons, patient safety and quality of care.

Patient Flow Analysis (PFA) is a quality improvement tool which is used to help identify patient flow inefficiencies at any type of health care facility and inform areas for intervention to help improve care delivery processes. Hospitals usually measure and set goals for patient flow based on: (i) Availability of patient beds; (ii) The throughput of areas where patients receive care treatment, and services (such as inpatient units, laboratory, and radiology); (iii) The safety of areas where patients receive care, treatment, and services.

National Institute of Ophthalmology (NIO) has an average of 1,500 to 2,000 patients receiving medical treatments per day. The 250-bed hospital has nine departments – Cataract, Cornea, Glaucoma, Retina, Oculoplastic, Pediatric ophthalmology, Neuro-ophthalmology, community-ophthalmology and LoVision.<sup>31</sup>

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<sup>31</sup> The Business Post, 2022. <https://businesspostbd.com/front/from-screening-to-eye-surgery-it-costs-tk-10-atnihospital-2022-05-21>

### 3.2 Daily Flow of Patients & Special Characteristics

Under this section, the Consultant will provide flow charts for the flow of patients visiting a hospital after feeling any eye related difficulties. Therefore, it will identify the special characteristics of ophthalmology compared to other medical disciplines such as what patients do when they feel other physical difficulties. A comparison flowchart will also be provided to develop a proper understanding of the differences between eye patients' characteristics and other patients' characteristics.

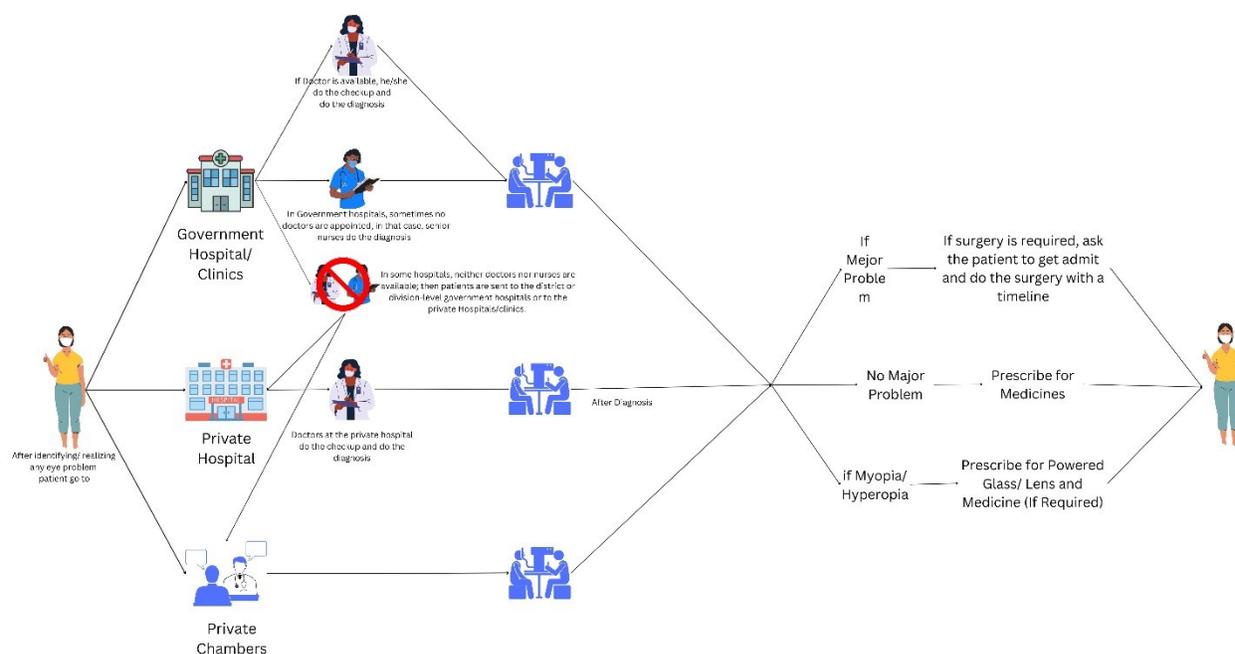
In Bangladesh, Patients with eye problems usually have three (Broad) types of treatment points government hospital/clinic, private hospital or clinic, and private chamber of eye specialists.

Depending on their income level or social condition, people decide the place of treatment. Usually, people with low-income levels and from rural areas choose government facilities. On the other hand, people with better financial status usually go to private facilities for better treatment. But some exceptions are also found; people with higher income level also goes to government facilities if private facilities are not available.

When a patient goes to a government facility, he faces three situations: an Eye Specialist is available; two, no eye Specialist but the senior nurse with diagnosis capability is available; and Third, neither Doctor nor nurse is available. They refer patients to other government or private facilities if no one is available.

Senior Nurses check the problem and its severity if they are in charge. If the problem is minor, they prescribe as per protocol, but if the problem is severe, they refer the patients to other facilities. If Doctor is available, they do the treatment. Sometimes rural government facilities do not have the proper equipment or facilities; in that case, patients are referred to better facilities.

## Exhibit-1: Flow of Patient in Bangladesh who Seeks Eye Treatment



As mentioned earlier, people with better financial status choose private facilities. There are two types of private facilities: hospitals or clinics; another is private chambers.

Some government doctors or private doctors do have private chamber facilities. However, these facilities are only for checkups and minor treatments like myopia/ Hyperopia.

Private facilities mostly do all type of treatments, they usually have modern facilities and equipment. However, they also charge premium prices for the treatment.

During the study, the consultant found similar behavioral patterns between eye patients' and other patients' characteristics. Patients' approach to treatment for Eye disease or other diseases is similar in Bangladesh.

### 3.3 Case Studies

#### Case Study 1

#### **BNSB Eye Hospital (NGO), Sylhet<sup>32</sup>**

Moulvibazar BNSB Eye Hospital, in the Sylhet region of northeast Bangladesh, is one of the few dedicated ophthalmology hospitals in the country. Hayley Coates found (2020) that there were no appointment times, patients pushed to be seen, patient confidentiality did not exist and the added problem of the intermittent electricity. BSNB Eye Hospital performs around 400 cataract surgeries a month. Unfortunately, due to lack of an anaesthetist, paediatric surgeries are performed less often, as an anaesthetist has to travel from afar. Paediatric cataract surgery was a swift procedure, with a second child anaesthetised in the operating procedure, while another lay in recovery, all within the same operating theatre.

<sup>32</sup> Coates H. 2020. Ophthalmology in Bangladesh. VOL 27 NO 2 | [www.eyenews.uk.com](http://www.eyenews.uk.com)

## Case Study 2

### General Hospital, Jamalpur<sup>33</sup>

A total number of 173 referred new retina cases were reviewed at outpatient department of the 250-bed General Hospital, Jamalpur between February 2017 and November 2017. Out of 7,164 new patients, of whom 173 patients were (2.42%) presented with retinal diseases, 139 patients were reviewed and followed up. Male: female ratio was 1.24:1 and out of 139 patients 55.4% were males and 44.6% females with a peak age group of 41-50 years. Diabetic related retinal (DR) conditions were 36 cases (25.9%), the most common cause.

The findings suggested that Retinal diseases remain an important cause of visual morbidity. The impression based on hospital practice is that the problem is increasing. This entails the necessity for accessible comprehensive eye care services, establishment of human resources, screening and awareness of the disease and affordable eye health policy.

Figure 10: Findings from the General Hospital, Jamarlpur Study

Retinal Disease pattern				Demographic characteristics of patients			
Retinal Disease	No. of Patients n (%)	Unilateral n (%)	Bilateral n (%)	Age	Male	Female	Total (%)
Amblyopia	5 (3.6%)	3	2	≤ 10	1	1	2
ARMD	11(7.9%)	6	5	11 – 20	4	5	9
BRVO	5(3.6%)	2	3	21 – 30	7	3	10
Chorioretinitis	20(14.4%)	13	7	31 – 40	12	10	22
Coloboma	4(2.9%)	3	1	41 – 50	20	20	40
CRVO	6(4.3%)	5	1	51 – 60	14	16	30
CSCR	4(2.9%)	3	1	61 – 70	13	5	18
Diabetic Retionopathy	36(25.9%)	13	23	71 – 80	5	2	7
Drusen	2(1.4%)	0	2	≥ 81	1	0	1
Hypertensive retinopathy	2(1.4%)	1	1	Total	77	62	139
Macular dystrophy	4(2.9%)	2	2				
Macular Edema	4(2.9%)	3	1				
Macular Hole	2(1.4%)	2	0				
Myopic degeneration	4(2.9%)	2	2				
Optic Atrophy	10(7.2%)	6	4				
Optic neuritis	4(2.9%)	1	3				
Retinal Detachment	1(0.7%)	9	1				
RP	5(3.6%)	2	3				
Vasculitis	1(0.7%)	0	1				
Total	139(100%)	76(54.7%)	63(45.3%)				

**General Hospital, Jamalpur**  
Survey Duration: February – November, 2017

Source: Huda, Khaleque et al., 2019. Frequency and Patterns of Retinal Eye Diseases in Outpatient Department of a District Hospital in Bangladesh.

DOI: <https://doi.org/10.3329/medtoday.v32i1.44812>

## Case Study 3

### Two Public Hospitals at Cumilla: BIOEH and Comilla Medical College Hospital's Ophthalmology Department<sup>34</sup>

Study findings by Haque et al. (2020) revealed outpatient data for two public hospitals where BIOEH's outdoor department consists of several major areas: triage, resuscitation room, immediate care unit, space

for minor emergencies, room for minor surgeries, critical observer. The findings were taken from the detailed data over the April (1– 30), 2019. On the other hand, the findings from the Comilla Medical College

<sup>33</sup> Huda, Khaleque et al., 2019. Frequency and Patterns of Retinal Eye Diseases in Outpatient Department of a District Hospital in Bangladesh. DOI: <https://doi.org/10.3329/medtoday.v32i1.44812>

<sup>34</sup> Haque O., Akter S., Hossen A., Rahman Z. 2020. A Case Study on Outpatient Waiting Time for Treatment with Multiple Server Queuing Model at Public Eye Hospital in Bangladesh.

Ophthalmology Department include detailed information over May (1 – 30), 2019. The findings are summarized below:

(i) In BIOEH, the average number of patients was 279 per day divided by 6.5 hours per day arrival rate resulting 43 patients per hour (in the first seven days). Overall, the average waiting time of each patient in this system is 29.4 minutes and the average number of patients 1264.2 per month (accounting for 6.5 hours per day arrival rate). The average number of patients or the patient flow of this hospital is very high but the number of specialists of this hospital which is not sufficient. So, this hospital must increase the number of specialists.

(ii) In Comilla Medical College Hospital Ophthalmology department, the average number of patients was 20 per day divided by 5.5 hours per day arrival rate resulting 4 patients per hour. On the whole, the average number of patients is very low but huge number of specialists. Finally, it was said that, to increase the patient flow of this hospital this hospital could be digitalized.

## Chapter 4: Business Model

Our business model will be focused more on the **B2B** aspect as we are not directly providing value to the patients. Our product and offerings are more catered towards the establishments and doctors treating the patients.

Having said that, much like Microsoft and Adobe our B2B business model should be a *customer centric B2B* model given that MITAS will sell its product and provide service and support to the clinics, hospitals and doctors using their product and platform to treat patients. This B2B business model will also ensure

*long-term success* by separating itself from anything else currently in the Bangladeshi market, eventually gain brand loyalty and be indispensable in taking treatment to the far corners of Bangladesh.

In this section we will use the business model canvas to help you understand our proposed business model in a straightforward, structured way. Using this canvas will lead to insights about the customers we could serve, what value propositions are offered through what channels, and how your company will make money.

<b>KEY PARTNERS</b> <ul style="list-style-type: none"> <li>• Islamiya Eye Hospital</li> <li>• Logisitcs and Sales Partner</li> <li>• Software &amp; tech support team</li> <li>• Ngos</li> </ul>	<b>KEY ACTIVITIES</b> <ul style="list-style-type: none"> <li>• Develop and nurture our relationship with these stakeholders.</li> <li>• Provide training to the clients</li> <li>• Seek out and develop partners in the form of hospitals or NGOs</li> <li>• Push sales of the device</li> <li>• Provide after sales service and training .</li> </ul>	<b>VALUE PROPOSITIONS</b> <p>We are essentially decentralizing the best ophthalmologic services in Bangladesh.</p> <ul style="list-style-type: none"> <li>• Smartphone lens to help diagnose eye problems.</li> <li>• A platform where the photos are sent to the ophthalmologists remotely and they in return, can send their diagnosis via the cloud platform</li> </ul>	<b>CUSTOMER RELATIONSHIPS</b> <ul style="list-style-type: none"> <li>• Logistic and sales team to build and expand on client base</li> <li>• Partners to earn stakeholder trust</li> <li>• Product team to take feedback to continuously innovate service</li> <li>• Backend on site software team readily available to receive client complaints and feedback</li> </ul>	<b>CUSTOMER SEGMENTS</b> <ul style="list-style-type: none"> <li>• Hospitals</li> <li>• District Health Clinics</li> <li>• Eye Clinics</li> <li>• Eyewear stores</li> <li>• Practicing Ophthalmologists</li> <li>• Government Buyers</li> </ul>
	<b>KEY RESOURCES</b> <ul style="list-style-type: none"> <li>• Skilled and able man power to run an operation Bangladesh encompassing all fronts from sales to tech</li> <li>• Knowledge of the Bangladeshi market</li> <li>• Enough capital to sustain operations until break even</li> </ul>		<b>CHANNELS</b> <ul style="list-style-type: none"> <li>• Conferences and seminars</li> <li>• Door to door marketing</li> <li>• Health Camps</li> <li>• other relevant BTL channels</li> </ul>	
<b>COST STRUCTURE</b> <ul style="list-style-type: none"> <li>i. Running the marketing and awareness campaign</li> <li>ii. Burning cash to offer subsidies to our partners for pilot programs</li> <li>iii. Employing the product team to fine tune our product and service</li> <li>iv. Running a full-on sales team on ground in Bangladesh</li> </ul>		<b>REVENUE STREAMS</b> <ul style="list-style-type: none"> <li>a. One-time revenue from each physical device sold.</li> <li>b. Subscription model monthly or annually charge for the cloud platform..</li> </ul>		
<b>ENVIRONMENTAL COSTS</b> <p style="text-align: center;">N/A</p>		<b>SOCIETAL COSTS</b>	<b>SOCIETAL BENEFITS</b> SDG 3 Compliant	<b>ENVIRONMENTAL BENEFITS</b> SDG 13 compliant





## 1. Customer segments.

*Our most important (future) segments. Most likely the segments that provide the most revenue.* Given we are operating on B2B model of course we have chosen the bodies providing ophthalmologic treatment. After deliberate research and analysis we have decided on the following core potential customers for our offerings

- i. **Hospitals:** This is a tricky group to sell our value proposition to. Most big hospitals have a very respectable pull of very good ophthalmologists already treating under their banner. They wouldn't need MITA's device to bring in doctors remotely to increase their patient traffic. The hospitals that would benefit from our provided value are the *ones outside Dhaka or metro areas and in remote areas*. There however, still arises a problem with this. Most hospitals outside the cities and metropolitan areas are government hospitals and only disperse to as much as upazilla level. Now, while these hospitals could benefit from using MITAS product offering to have renowned ophthalmologists sitting in Dhaka treat their patients, these upazilla level hospitals are all government owned and don't have any business obligations to reach as many patients as possible or make their lives more convenient. Providing affordable service is their primary objective in contrast to attaining peak operational efficiency. However, one way to reach and acquire this customer segment is to reach them through proper government channels as any decision to change their operational process is centralized in Bangladesh.
- ii. **District Health Clinics:** Zilla level hospitals are essentially the last line of hospitals with dedicated ophthalmologists. Our primary research show that there are Health Complexes run by the government at Upazilla levels and beyond. And these complexes are run by nurses and optometrists with diploma degrees to help in diagnosis of common case ophthalmology problems of patients. These health clinics are arguably the most potent customer group of ours as they could benefit the most out of our products and services.
- iii. **Eye Clinics/Vision Centers:** There are numerous private eye clinics or vision centers scattered throughout the country. These eye clinics are usually in the more remote parts of the country in contrast to health complexes. This itself makes these clinics prime targets for our value proposition as it's hard to come by quality ophthalmologists in remote areas. Our research almost suggests that of the 1100 ophthalmologists currently active in the country as much as 80% operate out of Dhaka. These clinics are mix of privately owned clinics and ones run by bigger hospitals based out of metro cities like Islamiya Eye Hospital in Dhaka.
- iv. **Eyewear stores:** A common practice in the relatively more remote areas of Bangladesh is that the Eyewear stores also chambers where they have dedicated big time ophthalmologist who comes to treat patients on the weekend. Throughout our primary research we have seen this practice even in the remote Chittagong Hill tracts where ophthalmologist from Chittagong metro comes once every week to treat

patients and diagnose problems. It is to be noted that the range of the services provided out of such an operation is limited to only diagnosis which again, could be easily done with the help of our device without the ophthalmologist having to make the commute from the metro city and the patients not having to wait an entire week to get treatment.

v. Ophthalmologists practicing across a wide geographical location: As just discussed there are ophthalmologists based in cities who go to remote areas once or twice a week or month to provide their services. These ophthalmologists usually have an agreement with eyewear stores or vision clinics. Since these ophthalmologists function as a complete unit in collaboration with the vision clinics and eye wear stores we should also be considering them as our potential customers.

vi. Government buyers: Government buyers could also be a potential customer segment as they have a lot of hospitals and health complexes under their jurisdiction. Having them as a customer would be an efficient way of taking over the market in the quickest amount of time.

## 2. Value proposition.

*Our products and services? What is the job we get done for the customer?*

Our value proposition would be the convenience of all hospitals and clinics being able to provide the highest quality of diagnosis services for their customers. This would be specifically true for hospitals outside Dhaka that would be able to have the best ophthalmologists that Dhaka has to offer under their umbrella to be able to provide services locally. ***We are essentially decentralizing the best ophthalmologic services in Bangladesh.***

To be more specific however, our value proposition would be *two pronged* combining both a physical product and tangible service. Our product would be the smartphone lens to help diagnose eye problems. The service end of our proposition would include the platform where the photos are sent to the ophthalmologists remotely and they in return, can send their diagnosis via the cloud platform. Ai could also be included in the service basket where it will help ophthalmologists to diagnose eye problems.

## 3. Revenue streams

*List of our top three revenue streams.*

Revenue stream from the device should also be from each value proposition touchpoint.

- a. There will be a single one-time revenue from each physical device sold.
- b. The ophthalmologists should be charged on a subscription model monthly or annually for using the cloud platform.

- c. Certain premium features to the platform could also be added behind a paywall (e.g. Ai to help with diagnosis, automated record and entry updating etc. for instance) that the ophthalmologists could pay premium to unlock.

#### 4. Societal and environmental benefits.

*What are we giving back to our community and planet?*

The impact of our product will go well beyond just decentralizing quality ophthalmology services across Bangladesh. The environmental and social benefits should align our business with **SDG goals 3 & 13**.

**Societal benefits:** Our business model will help decentralize ophthalmologic services to corners of the country where there are no ophthalmologists. Moreover, it will also increase efficiency of the ophthalmology service sector. Which would essentially mean that each ophthalmologist would be able to serve more patients across more geographical area. This essentially contributes to **SDG 3: Good Health & Well Being**.

**Environmental Benefit:** The proposed business model should also have significant environmental impact as it will help reduce carbon footprint associated with ophthalmologic services within our country.

Within our model, ophthalmologists won't have to travel to provide services. Rather they can serve more than one geographical location at a time remotely. Moreover, patients in remote areas without dedicated

Ophthalmologists wouldn't have to travel to upazilla or zilla level towns to receive basic ophthalmologic services. This, we believe helps reduce the carbon footprint associated with delivering and availing ophthalmologic services. Thus, our model also helps contribute to **SDG 13: climate Action**.

Our Societal and environmental benefits combined could make us potentially very attractive partners for NGOs and INGOs operating in the country, and even the Government agencies which would help provide us with more access and reach than would be possible on our own.

#### 5. Channels.

*How do we communicate with our customer? How do we deliver the value proposition?*

Being able to communicate our value proposition to all the stake holders would be of the utmost importance for our business model to succeed. Our business is to have two separate customer segments for the 2 different parts of our value proposition.

**Ophthalmologists and/or Hospitals (Service End):** this is the segment who mainly receive the service aspect of our value proposition. They will be the ones using our platform and Ai, one its developed to help diagnose patients remotely. Now communicating with this segment would include us going to these ophthalmologists and showing us demos. Since the main value we are providing these ophthalmologists is the convenience

of telemedicine it shouldn't be that hard as it isn't a foreign concept in the medial world; just that the means for telemedicine and diagnosis in the ophthalmology sector wasn't readily available at their convenient till now.

Regarding reaching as many ophthalmologists as possible presenting in ophthalmology conferences would be the most efficient way to reach more ophthalmologists and hospitals and sell them.

On ground remote eye clinics/vision clinics (Product End): This segment is the one that will be using the actual device developed that will help them diagnose eye problems with a smart phone camera.

Now this is the segment that isn't as familiar with telemedicine. Communicating our value proposition to this segment also includes communicating with the patients who happen to be their major stakeholders. These clinics strive on having reputed ophthalmologists over physically ½ days a week. So, we would have to help them educate their stakeholders i.e. the customers too on this form of remote diagnosis. The good thing, however, is that our research would indicate that it is possible. Islamiya Eye Hospital has done it through their door-to-door campaigns, and we could do something of similar nature in partnership with big eye hospitals like Islamiya or NGOs with far reach.

So essentially, for both our customer segments we would need a more ***direct approach in terms of communicating our value proposition*** where we as the stakeholders ourselves try communicating with our potential stakeholders i.e., ***Below the Line (BTL) marketing***. direct means of communication, most commonly direct mail and fliers, going door to door often using highly targeted lists of names to maximize response rates.

## 6. Customer relationships.

*How does this show up and how do we maintain the relationship?*

Maintaining customer relationships would be critical for the business to stay afloat. this could possibly be done in the following ways:

- a. The logistics and sales partner would be continuously exploring new markets and customers, build rapport and provide after sales support and training
- b. The core team should also follow up with our key partners esp. in our pilot stages to ensure smooth implementation of our activation activities.
- c. The product and strategy team could take feedback from the platform users to finetune the service offered or innovate new service dimensions should the need arise.
- d. The software and product team would also need to be in contact with the doctors on our platform for feedback or bug fixing.

## 7. Key activities.

*What do you do every day to run your business model?*

To hit the ground running our business will have to undertake a few key activities that might even take shape as daily endeavors to continually grow and expand.

- Reach out to doctors and hospitals, participate in conferences to raise awareness of our offerings among the ophthalmology community in the country to preferably attract them to avail our services
- Develop and nurture our relationship with these stakeholders.
- Provide training to the ophthalmologists or hospitals on how to use our platform.
- Seek out and develop partners in the form of hospitals or NGOs to push our diagnosis device to the remote rural areas and raise awareness about it.
- Push sales of the device to remote independent eye clinics/vision centers.
- Provide after sales service and training to the people manning the clinics and maybe even making optometrists out of this people.
- Have our backend team continually develop our platform to finetune it and evolve with the trends and demands of time keeping innovation at our core.

## 8. Key resources.

*The people, knowledge, means, and money we need to run our business.*

The people: For the business to work out we need efficient and capable people working both ends. Some of the people we would possibly need are

- people to develop and maintain customer relationships
- people to develop our marketing campaigns
- a panel of experts to talk with the doctors and hospitals
- a back-end software & product team to continually strive to improve the service angle of our offering as innovation is the name of the game.

Knowledge: For any business entering a new market knowledge is arguably the greatest weapon they could possibly yield. In that regards we would need sound and concrete knowledge pertaining:

- a. Knowledge and understanding of the Bangladeshi ophthalmology sector.
- b. Common Ophthalmologic practices in the country esp. in areas outside metro cities.
- c. Current diagnosis means of ophthalmologic problems and proper identification of the pain points from the perspective of both the service providers and receivers.
- d. Current digital literacy rate of the ophthalmologists in currently active and their willingness to adapt.

- e. A proper psychographic evaluation of the people providing and receiving ophthalmologic services outside the metro cities of the country.
- f. The distribution scenario of Bangladesh.

Means: With the main team based out of Japan the business could possibly operate through a few on ground partners. In this way the onsite team/ partners in Bangladesh would be in charge of acquiring new market, revenue generation and other day to day operational functions whereas the core team in Japan can solely focus on the product and service and avoid marketing myopia

Money: Given the cost structure and the revenue it is advisable to enter the business with some capital at hand as it might take a while to break even given how we might have to offer subsidies on our devices and services in our pilot program which will most likely continue until there's a behavioral change among all the major stakeholders to the point where we are indispensable much like tele medicine brands like Prava Health and HealthX and other first mover brands like bKash.

## 9. Key partners.

*List of the partners that we can't do business without (not suppliers).*

Unless MITAS wants to run every aspect of the business themselves from on ground un the country it is very essential to have partners that would play their substitutes as their on-ground representatives. Some of the key partners could be:

Islamiya Eye Hospital: Given that the main use case of our product and service is decentralizing ophthalmologic services remotely we would need to focus on remote areas. In this regard a suitable partner for our pilot program would be Islamiya Eye hospital. They are already trying to remotely diagnose ophthalmologic problems albeit to a limited capacity and they have the reach and the general acceptance among mass people that could be used to our advantage. They've already done the heavy lifting of doing door to door marketing and vision camps to ramp up general acceptance and support for the process of remote ophthalmologic diagnosis.

In our primary research we've found out that Islamiya Eye Hospital is already serving 1/3<sup>rd</sup> of the market with 3 secondary hospitals outside Dhaka which in turn have 18 vision clinics operating under them in very remote areas. They have a makeshift system of attaching a camera with their diagnosis machine to send images to their ophthalmologists remotely. Currently they are in the process of looking for a solution to their pain points which would make their process easier and more convenient making Islamiya Eye Hospital a very good potential client.

Logistics and Sales Force: A dedicated logistics and sales force would be paramount to business success. This partner would be responsible for pushing sales and exploring new markets, setting up training for optometrists on how to use the device, arranging the BTL activation campaigns and the conferences we participate in to showcase our products and services.

Software and tech support team: The service aspect of the business is extremely important as this is what retains the customer and brings in the steady stream of revenue. For this reason, it is important to have a tech partner on ground in Bangladesh who will provide whatever backend software support is required on part of the customers.

NGOs: We would also need partners for our awareness and marketing campaigns in the form of local and International NGOs. While we have mentioned the requirement of partnership in the form of a sales and marketing team, we would still need to pair up with NGOs. This is primarily because the big *NGOs* have the *foothold, structure and credibility* at grassroot level in place to run an awareness campaign of our product successfully. We have already provided a list of NGOs currently working with health care in the country, namely, Brac, Bangladesh Eye Care Society, Orbis Bangladesh etc. Each of these are perfect potential partners for us. Moreover, since our product is SDG 3 and 13 compliant teaming up with NGOs only make sense as such a symbiotic relationship would benefit both parties.

## 10. Cost structure.

*List of our top costs by looking at activities and resources.*

Taking into consideration our estimate of the probable day to day business activities and the estimated resource expenditure, our cost structure will be comprised mainly of costs such as:

- i. Running the marketing and awareness campaign
- ii. Burning cash to offer subsidies to our partners for pilot programs
- iii. Employing the product team to fine tune our product and service
- iv. Running a full-on sales team on ground in Bangladesh

## 11. Societal and environmental costs.

*What's the negative impact of our business model?*

To our knowledge there are no societal and environmental costs to the proposed business model as the model mostly aims to connect more people with the technology at hand rather than disrupting the sector.

## Appendix

### Appendix 1: Secondary Study

#### Number of Eyecare Professionals:

*Table 23: Distribution of eye care workforce throughout the country (as of 2019)*

Eye care professionals	Government	Private	NGO	Total
<b>Ophthalmologists</b>	500	400	300	1200
<b>General ophthalmologists</b>	300	100	200	600
<b>Cataract and corneal surgeons</b>	200	100	200	500
<b>Retinal surgeons</b>	10	5	35	40
<b>Pediatric ophthalmologists</b>	15	0	25	40
<b>*Oculoplastic surgeons</b>	--	--	--	--
<b>*Glaucoma surgeons</b>	--	--	--	--
<b>*Uveal surgeons</b>	--	--	--	--
<b>Optometrists</b>	0	500	200	700
<b>Opticians</b>	0	20	80	100
<b>Ophthalmic nurses</b>	200	0	0	200
<b>Orthoptists</b>	Nil			
<b>Ophthalmic and optometric assistants</b>	200	0	600	800
<b>Ophthalmic and optometric technicians</b>	5	5	0	10
<b>Vision therapists</b>	0	2	0	2
<b>Ocularists</b>	0	0	1	1
<b>Ophthalmic photographers and imagers</b>	2	6	12	20
<b>Ophthalmic administrators</b>	0	100	200	300
<b>*Mid-level ophthalmic paramedics (MLOP)</b>	--	--	--	--
<b>*Counsellor</b>	--	--	--	--

Source: Hussain et al., 2022 (data as of 2018)

## List of eyecare facilities in the selected regions

Table 24: List of available eye specialized facilities in the selected regions

### Dhaka

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Al- Noor Eye Hospital	30
2	Almas Eye Care & Phaco Centre	10
3	Asia Digital Eye Hospital	10
4	Bangladesh Eye Foundation and Research Hospital Limited	10
5	Bangladesh Eye Hospital & Institute	20
6	Bangladesh Eye Hospital Shantinagar Ltd.	10
Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
7	Bashundhara Eye Hospital & Research Institute	10
8	City Lions Eye Hospital & Optometry Research Institute Ltd.	10
9	Deen Mohd. Eye Hospital & Research Center	N/A
10	Dhaka Central Eye Hospital	8
11	Dhaka Eye Care Hospital	10
12	Dhaka Metro Eye Hospital	20
13	Dhaka New Lions Eye Hospital	10
14	Dhamrai Drishty Seba Eye Hospital	10
15	Dristi Chokkhu Hospital	10
16	Dristi Eye Hospital Banasree	5
17	Eye Health Bangladesh Ltd.	10
18	Fashion Eye Hospital Ltd.	20
19	Green Eye Hospital Ltd.	8
20	Harun Eye Foundation Hospital	10
21	Hazi Shakhawat Anwara Eye Hospital Ltd.	25

22	Hemayetpur Eye Hospital and Diagnostic Centre	10
23	Hikmah Eye Hospital Ltd.	10
24	Icon Eye Hospital Limited	10
25	Islamia Eye & laser centre	10
26	Ispahani Islamia Eye Institute & Hospital	200
27	Jatrabari Chakkhu Hospital	10
28	Khandker Mahbub Hossain Eye Hospital, Dhaka	30
29	Lion A Badal Eye Hospital	8
30	Lions Eye & General Hospital	84
31	Makka Eye Hospital	20
32	Maula Buksh Sardar Charitable Eye Hospital	10
33	Mirpur Chakkhu Hospital	5
34	Mobile Eye Hospital Ltd.	10
<b>Sl. No.</b>	<b>Eye Specialist Hospital/ Clinic</b>	<b>Approved Bed Number</b>
35	Mustafiz Glaucoma Research and Eye Hospital	10
<b>36</b>	<b>National Institute of Ophthalmology (NIO) (Government)</b>	<b>250</b>
37	Nayan Tara Eye Hospital	10
38	OSB Eye Hospital	10
39	Prime Bank Eye Hospital	10
40	Professor Dr. Md. T. Islam (Shamim) Chakkhu Hospital	10
41	Rahima Eye Hospital	10
42	Savar Central Eye Hospital	10
43	Savar Eye Hospital & Phaco Centre	10
44	South Asian Eye Hospital	10
45	The Capital Eye Hospital Limited	10

46	VARD Eye Hospital, Adabor, Dhaka	N/A
47	Vision Eye Hospital Private Limited	10
48	Vital Chokkhu Hospital and Phaco Center	10
49	VSS (Vision Saving Services) Eye Hospital	10

#### Shariatpur

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Islami Eye Hospital	10
2	Naria Eye Hospital	10
3	Shariatpur Eye Hospital	10

#### Mymensingh

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	BNSB Eye Hospital, Mymensingh	31
2	Dr. Muqtadir Eye Hospital	10
3	Nawab Ali Memorial Diabetic & Eye Hospital	10
Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
4	Parmita Eye Hospital (Pvt)	10
5	Polli Eye Hospital	10
6	Siam Eye Hospital	10

#### Jamalpur

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Aleya Chokkho Hospital	10
2	Bangladesh Digital Eye Hospital	10
3	Ispahani Islamia Eye Institute and Hospital, Jamalpur	25

### Rangpur

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Advance Eye Hospital	10
2	Community Eye Hospital	30
3	Deep Eye Care Foundation	50
4	Global Eye & Health Care Hospital Ltd.	20
5	Makka Eye Hospital- Rangpur	20
6	Marium Eye Hospital	10
7	Rangpur Eye Hospital	20

### Lalmonirhat

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Orbit Eye Hospital	10
2	RDRS Eye Care Center	N/A

### Sylhet

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Friends Eye Hospital	20
2	Jalalabad Eye Hospital	10
3	Sylhet Adhunik Chakku Haspatal	20
4	Sylhet Eye Hospital & Laser Centre	17
5	Vard Eye Hospital (Balaganj)	50
6	Vard Eye Hospital (Sylhet Sadar)	20

### Habiganj

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Chunarughat Eye Hospital	10
2	Dr. Shahid Eye Hospital	10
3	Islamia Chokku Hospital	10
4	JASPUS Habiganj Adhunik Eye Hospital	10
5	Madhabpur Digital Eye Hospital	10

### Rajshahi

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Makka Eye Hospital	20
2	Rajshahi Eye Hospital	20
3	Rajshahi Lions Eye Hospital	N/A

### Joypurhat

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Makka Eye Hospital-Joypurhat	10
2	Khanjanpur Mission Health Service	10

### Chattogram

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Chittagong Eye Infirmary and Training Complex	110
2	Bandartila Eye Hospital	10
3	Bangladesh Eye Hospital, Chittagong Limited	10
4	Chevron Eye Hospital & Research Center	10
5	Chittagong Eye Care Center	10

6	City Eye Hospital and Diabetes Center	10
7	Dishari Eye Hospital	8
8	Karnaphuli Eye Hospital & Diabetic Center	10
9	Royal Community Eye Hospital	10
10	Vision Community Eye Hospital	10

#### Bandarban

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Bandarban eye hospital	10

#### Barishal

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Asian Eye Care Hospital	10
2	Barishal Adhunik Eye Hospital	20
3	Barishal Eye Care Hospital	10
4	Barishal Islami Eye Hospital	10
5	Friendship Muladi Eye Hospital	10
6	Gournadi Eye Hospital	10
7	Grameen Green Children (GC) Eye Hospital	10
8	Ispahani Islamia Eye Institute and Hospital, Barisal Branch	28
9	Real Eye Hospital	10

#### Barguna

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Islami Eye Hospital	10
2	Sandhani Eye Hospital	10

## Khulna

Sl. No.	Eye Specialist Hospital/ Clinic	Approved Bed Number
1	Bangladesh Eye Hospital, Khulna	10
2	Daulatpur Poly Eye Hospital	10
3	Disha Eye and Mother Care Centre	10
4	Khulna BNSB Eye Hospital	42
5	Khulna Eye Hospital and Laser Centre Ltd.	10

## Narail

There is no eye specialist hospital in the Narail district.

## Medical Device Registration in Bangladesh<sup>35</sup>:

**Registration Guidelines for Medical Devices Bangladesh 2015** ‘Medical Device’ means any instrument, apparatus, implement, machine, appliance, implant, reagent for in vitro use, software, material or other similar or related article, intended by the manufacturer to be used, alone or in combination, for human beings, for one or more of the specific medical purposes(s) of:

- Diagnosis, prevention, monitoring, treatment or alleviation of disease,
- Diagnosis, monitoring, treatment, alleviation of or compensation for an injury,
- Investigation, replacement, modification, or support of the anatomy or of a physiological process,
- Supporting or sustaining life,
- Control of conception,
- Disinfection of medical devices,
- Providing information by means of in vitro examination of specimens derived from the human body and does not achieve its primary intended action by pharmacological, immunological or metabolic means, in or on the human body, but which may be assisted in its intended function by such means shall be deemed to be a Device under the meaning of Section (3)b (ii), (iii) and (v) of the Drugs Act 1940.

### Medical Device Guideline shall not apply to:

- i. Medicinal products covered by the Drugs Act. In deciding whether a product falls under the drug category under the Drugs Act or Medical Devices under this Guideline, particular account shall be taken of the principal mode of action of the product;
- ii. Cosmetic products
- iii. Human blood, blood products, plasma or blood cells of human origin transplants or tissues or cells of human origin or to products incorporating or derived from tissues or cells of human origin,

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<sup>35</sup> Alam K. 2017. Medical Device Registration in Bangladesh. <https://www.linkedin.com/pulse/medicaldeviceregistration-bangladesh-kazi-neamat-farjanal-alam/>

iv. Transplants or tissues or cells of animal origin, unless a device is manufactured utilizing animal tissue which is rendered nonviable or non-viable products derived from animal tissue on the approximation of provisions laid down by law, regulation or administrative action relating to proprietary medicinal products and laying down special provisions for medicinal products derived from human blood or human plasma.

**Classification:** Medical Devices shall be classified as per their risk level and intended use. They shall be divided into Classes A, B, C and D.

**Classification Rules (procedures):** In case the product does not follow the said classification, internationally accepted classification may be accepted by DGDA. Whereas the classification rules are based on the intended use and vulnerability of the human body taking into account of the potential risks associated with the technical design and manufacture of the devices.

### **Procedure for registration of Medical Devices for manufacture and import into Bangladesh**

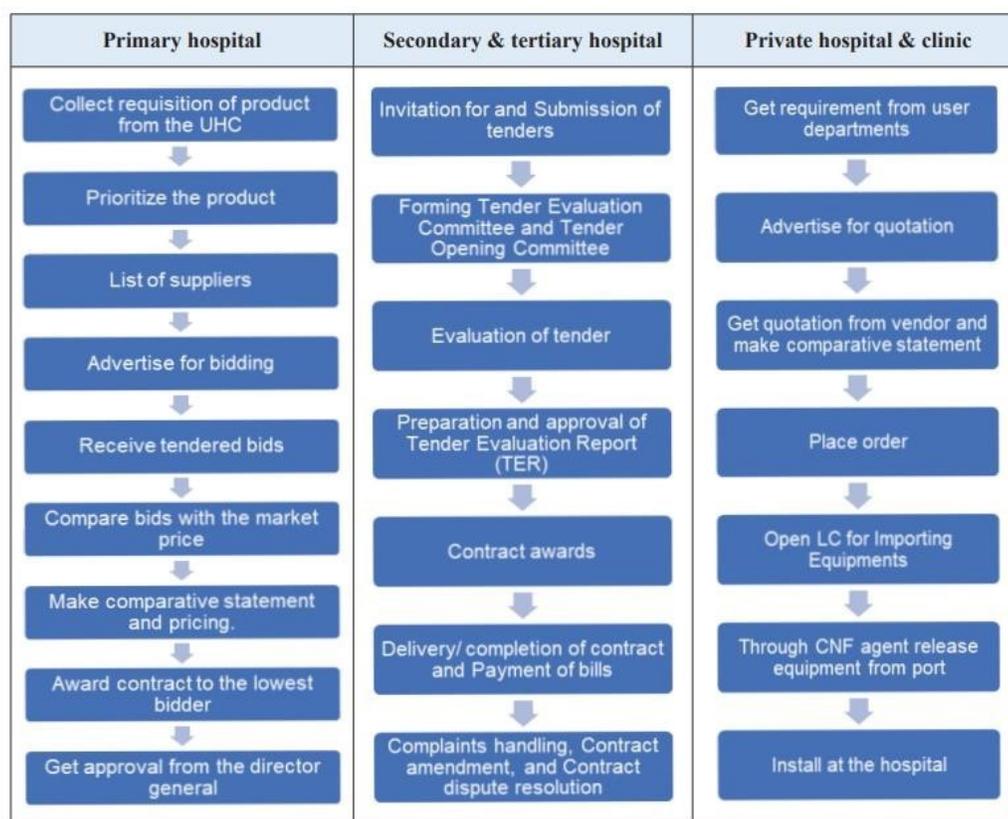
All Medical Devices of Class B, C and D, as per the below mentioned classification shall be registered before they are imported or manufactured into the country.

1. Application for registration of medical devices which are already being imported or manufactured into the country shall be made immediately from the issue of this guideline.
2. For Medical Devices which are to be imported or manufactured for the first time, the applicant has to apply for registration before such import or manufacture.
3. The application for registration has to be made by a local authorized person of the manufacturer or foreign supplier or authorized agent to the DGDA.

### **Procedure for application**

1. Application for registration of a Medical Devices shall be made by the authorized person or local authorized agent of the manufacturer, or foreign supplier in the prescribed form to the office of the DGDA.
2. Prescribed fees of BDT shall be paid along with the application.
3. Separate application and fees are to be paid for separate applications, separate manufacturing premises and separate products. Similar type of Medical Devices if manufactured in the same premises can be applied in the same application form (Example – All Stents – Similar type, All Intra Ocular Lenses – Similar type, All Catheters – Similar type, All Orthopaedic Implants – Similar type, All Sutures – Similar type etc.). However, an application shall not have more than 5 products and for more than 5 products separate applications shall be made. (To consider company placing product as a manufacturer)

Table 25: Procurement practices of medical equipment/ devices by different type of hospital<sup>36</sup>



Source: BIDA & JICA

<sup>36</sup> BIDA & JICA, 2022. Page 21. Medical Equipment & Devices Industry in Bangladesh.

## Prescription Eyeglasses' Supply Chain:

Table 26: Prescription Eyeglasses' Supply Chain Steps<sup>37</sup>

SUPPLY CHAIN	(1) LENSES AND FRAMES MANUFACTURING	(2) SHIPPING	(3) IMPORT	(4) DISTRIBUTION	(5) OPTICAL ASSEMBLY LAB	(6) RETAIL
Prescription eyeglasses	Uncut lenses and frames are manufactured.	Lenses and frames are shipped to LMICs.	Lenses and frames go through customs at the port of entry.	Lenses and frames are stocked in a warehouse and distributed to optical labs or points of sale.	Uncut lenses are edged and assembled onto the frame.	Eyeglasses are sold to users in optical shops or vision centres.

The supply chain for prescription eyeglasses is complex due to the level of customization required which adds cost to the user.

## Harun Eye Foundation Investigation Rates

Table 27: Investigation rates at Harun Eye Foundation Hospital<sup>38</sup>

SL. No	Procedure	Eye	Charges (BDT)	Charges (USD)
LASER PROCEDURE				

<sup>37</sup> Product Narrative: Eyeglasses. March 2020. A Market Landscape and Strategic Approach to Increasing Access to Eyeglasses in Low- and Middle-Income Countries.

<sup>38</sup> <http://hefh.infocarebd.com/investigation-rate/>

1	Laser Argon	One Eye	4,000+2,000=6,000	61.86
2	Laser Yag	One Eye	4,000+2,000=6,000	61.86
3	Conventional Lasik	One Eye	25,000	257.73
4	Conventional Lasik	Both Eyes	50,000	515.46
5	T-PRK	One Eye	25,000	257.73
6	T-PRK	Both Eyes	50,000	515.46
7	Femto Lasik	One Eye	49,000	505.15
8	Femto Lasik	Both Eyes	98,000	1,010.31
9	Femto DLK	One Eye	25,000	257.73
<b>INVESTIGATIONS</b>				
10	Visual Field Analysis	One Eye	1,000	10.31
11	Visual Field Analysis	Both Eyes	1,500	15.46

12	Visual Field Analysis + Swap	One Eye	1,500	15.46
13	Visual Field Analysis + Swap	Both Eyes	2,500	25.77
14	Visual Field Analysis + GPA	One Eye	1,500	15.46
15	Visual Field Analysis + GPA	Both Eyes	2,500	25.77
16	Biometry (Conventional)	One Eye	1,000	10.31
17	Biometry (Conventional)	Both Eyes	1,500	15.46
18	Biometry (IOL Master)	One Eye	1,500	15.46
19	Biometry (IOL Master)	Both Eyes	2,500	25.77
20	Biometry (Conventional + IOL Master)	One Eye	2,000	20.62

21	Biometry (Conventional + IOL Master)	Both Eyes	3,000	30.93
22	B- Scan	One Eye	1,000	10.31
23	B- Scan	Both Eyes	2,000	20.62
24	Specular Microscopy	One Eye	1,000	10.31

SL. No	Procedure	Eye	Charges (BDT)	Charges (USD)
25	Specular Microscopy	Both Eyes	1,500	15.46
26	UBM	One Eye	1,000	10.31
27	UBM	Both Eyes	2,000	20.62
28	Biometry (Conventional) + B- Scan	One Eye	1,500	15.46
29	Biometry (Conventional) + B- Scan	Both Eyes	2,500	25.77
30	Biometry (IOL Master) + B- Scan	One Eye	2,000	20.62
31	Biometry (IOL Master) + B- Scan	Both Eyes	3,500	36.08
32	Biometry (Conventional) + Specular Microscopy	One Eye	1,500	15.46
33	Biometry (Conventional) + Specular Microscopy	Both Eyes	2,500	25.77
34	Biometry (IOL Master) + Specular Microscopy	One Eye	2,000	20.62

35	Biometry (IOL Master) + Specular Microscopy	Both Eyes	3,500	36.08
36	Biometry (Conventional) + B- Scan + Specular Microscopy	One Eye	2,000	20.62
37	Biometry (Conventional) + B- Scan + Specular Microscopy	Both Eyes	3,500	36.08
38	Biometry (IOL Master) + B- Scan + Specular Microscopy	One Eye	2,500	25.77

39	Biometry (IOL Master) + B- Scan + Specular Microscopy	Both Eyes	4,500	46.39
40	Biometry (Conventional + IOL Master) + B- Scan	One Eye	2,500	25.77
41	Biometry (Conventional + IOL Master) + B- Scan	Both Eyes	4,000	41.24
42	Biometry (Conventional + IOL Master) + Specular Microscopy	One Eye	2,500	25.77
43	Biometry (Conventional + IOL Master) + Specular Microscopy	Both Eyes	4,000	41.24
44	Biometry (Conventional + IOL Master) + B- Scan + Specular Microscopy	One Eye	3,000	30.93
45	Biometry (Conventional + IOL Master) + B- Scan + Specular Microscopy	Both Eyes	5,000	51.55
46	Pachymetry (CCT)	One Eye	1,000	10.31
47	Pachymetry (CCT)	Both Eyes	1,500	15.46
48	Corneal Topography by Oculyzer	One Eye	1,000	10.31
49	Corneal Topography by Oculyzer	Both Eyes	2,000	20.62
<b>SL. No</b>	<b>Procedure</b>	<b>Eye</b>	<b>Charges (BDT)</b>	<b>Charges (USD)</b>
50	Corneal Topography + CCT by Oculyzer	One Eye	1,500	15.46
51	Corneal Topography + CCT by Oculyzer	Both Eyes	3,000	30.93
52	Pre- Lasik by Oculyzer	One Eye	2,000	20.62
53	Pre- Lasik by Oculyzer	Both Eyes	4,000	41.24
54	Color Fundus Photography	One Eye	500	5.15
55	Color Fundus Photography	Both Eyes	1,000	10.31

56	Color Fundus Photography +Montage View	One Eye	1,000	10.31
57	Color Fundus Photography +Montage View	Both Eyes	2,000	20.62
58	Fundus Fluorescein Angiography	One Eye	2,500	25.77
59	Fundus Fluorescein Angiography Single Injection	Both Eyes	4,000	41.24
60	FFA Montage View (Add)	Per Pic	500	5.15
<b>INVESTIGATIONS OCT (Optical Coherence Tomography)</b>				
61	OCT Optic Disc +RNFL 2D	One Eye	2,500	25.77
62	OCT Optic Disc +RNFL 2D	Both Eyes	4,500	46.39
63	OCT Optic Disc +RNFL 3D	One Eye	3,000	30.93
64	OCT Optic Disc +RNFL 3D	Both Eyes	5,500	56.70
65	OCT Macula 2D	One Eye	2,500	25.77
66	OCT Macula 2D	Both Eyes	4,500	46.39
67	OCT Macula 3D	One Eye	3,000	30.93
68	OCT Macula 3D	Both Eyes	5,500	56.70
69	OCT Posterior Segment:Optic Disc+RNFL+Macula 2D	One Eye	4,000	41.24
70	OCT Posterior Segment:Optic Disc+RNFL+Macula 2D	Both Eyes	8,000	82.47
71	OCT Posterior Segment:Optic Disc+RNFL+Macula 3D	One Eye	5,000	51.55
72	OCT Posterior Segment:Optic Disc+RNFL+Macula 3D	Both Eyes	10,000	103.09
73	OCT Anterior Segment: Angle & Cornea 3D	One Eye	3,000	30.93
74	OCT Anterior Segment: Angle & Cornea 3D	Both Eyes	5,500	56.70

75	Angio OCT (OCTA) Optic Disc + RNFL	One Eye	4,000	41.24
SL. No	Procedure	Eye	Charges (BDT)	Charges (USD)
76	Angio OCT (OCTA) Optic Disc + RNFL	Both Eyes	7,000	72.16
77	Angio OCT (OCTA) Macula / Retina (Montage View)	One Eye	4,000	41.24
78	Angio OCT (OCTA) Macula / Retina (Montage View)	Both Eyes	7,000	72.16

## List of essential Ophthalmic drugs in Bangladesh

Table 28: List of Ophthalmic drugs considered essential in Bangladesh

Drugs/ Medicines	Type
<b>Diagnostic agents</b>	
<b>Ophthalmic medicines:</b>	
Flurescein	Eye drops
Tropicamide	Eye drops
<b>Radiocontrast media:</b>	
Barium Sulphate (X-Ray Grade)	
Lodipamide	Injection
Lothalmic Acid with Meglumine	Oral solution
<b>Ophthalmological preparations</b>	
<b>Anti-infective agents:</b>	
Framycetin Sulphate	Eye drops/Ointment
Gentamycin	Injection/Eye drops/ Ointment
Tetracaine/Amethocaine	Eye drops
Chloramphenicol	Eye drops/Ointment
<b>Anti-inflammatory agents:</b>	
Corticosteroid	Eye drops/Ointment
Betamethasone with Neomycin	Eye drops
<b>Local anaesthetics:</b>	

Tetracaine/Amethocaine	Eye drops
<b>Miotics and antiglaucoma medicines:</b>	
Pilocarpine	Eye drops (Various strengths)
Acetazolamide	Tablet
Carbachol	Tablet/Eye drops
Metarminol	Injection
<b>Mydriatics:</b>	
Phenylephrine Hydrochloride	Eye drops
Homatropine	Eye drops
Atropine Suphate	Injection/eye drop/ointment

Source: National Health Bulletin 2017

### Some capture during primary survey



Outdoor patients in government hospital



Admitted patients in government hospital



Chattogram medical college hospital



Eyeglass shop inside the private hospital



District hospital, Barguna