

# A Report of Rapid Assessment of Avoidable Blindness Survey 2019

Madhesh Province, Nepal



Technical Support:

Financial Assistance

Siraha



Conducted By

Sagarmatha Choudhary Eye Hospital, Lahan  
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International Agency for Prevention of Blindness  
IAPB – SEA

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Remarks from Chairman  
**Prof. Dr. Chet Raj Pant**  
Nepal Netra Jyoti Sangh

**“This report offers a comprehensive overview of the current eye care situation in the Madhesh province and lays a strong foundation for future planning and the development of new eye care strategies.”**

We are proud to announce the publication of the Rapid Assessment of Avoidable Blindness (RAAB-2019) survey report as a book. This achievement is the result of a collaborative effort between RM Kedia Eye Hospital, Birgunj, Gaur Eye Hospital, Gaur, Sagarmatha Choudhary Eye Hospital, Lahan, and all eye care stakeholders. This report offers a comprehensive overview of the current eye care situation in the Madhesh province and lays a strong foundation for future planning and the development of new eye care strategies. Despite significant progress, there remains a pressing need for quality and accessible eye care services across the province. I firmly believe that this report will be instrumental in realizing this goal.

I extend my heartfelt gratitude to every individual and organization involved, directly or indirectly, in the successful completion of the RAAB survey. Special thanks go to all the teams and managers for their invaluable contributions to this monumental effort to make this survey happen.



Remarks from Vice President  
**Mr. Shyam Kumar Pokhrel**

Senior Vice President,  
Nepal Netra Jyoti Sangh

**“To achieve this,  
we must advocate  
jointly with the  
Provincial  
Government and  
collaborate closely  
to implement  
these strategies  
as soon as  
possible.”**

It is our great pleasure to announce the publication of the provincial RAAB survey report-2019 of Madhesh Province as a concise book. This report presents evidence-based data and information on the current blindness scenario in Madhesh Province, which will be instrumental for the future planning of eye care services. As the Senior vice President of Nepal Netra Jyoti Sangh, I recognize the clear need for a comprehensive Provincial eye health policy and strategy for Madhesh Province. To achieve this, we must advocate jointly with the Provincial Government and collaborate closely to implement these strategies as soon as possible. I extend my heartfelt gratitude to the NNJS Central Office, the International Agency for the Prevention of Blindness (IAPB), and the employees of R.M. Kedia Eye Hospital, Birgunj, Gaur Eye Hospital, Gaur, and Sagarmatha Choudhary Eye Hospital, Lahan, for their technical and financial support in conducting this study.

Furthermore, I am deeply appreciative of all those who directly contributed to this study, including the enumerators whose hard work and dedication were crucial in making this study successful. Together, we have taken a significant step forward in addressing the eye care needs of the Madhesh Province. I am confident that this report will serve as a vital tool in our ongoing efforts to improve eye care services and ensure that quality eye care is accessible to all.

## MESSAGE FROM CHAIRMAN

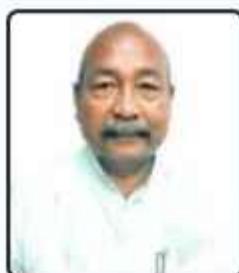
**“We are working with the guidance of Central NNJS and providing Comprehensive Eye Care service to Nepalese as well as patients from India and Bangladesh.”**

It is our immense pleasure to announce the publication of RAAB survey report 2019 of Madhesh Province. We believe that the data and information provided in survey will help us strengthen Eye Care service in our province. This survey report is also the reflection of our activities which we have been doing.

Eye care service in Nepal is expanding constantly with dedication of Human Resources and with the support of modern technology. We are working with the guidance of Central NNJS and providing Comprehensive Eye Care service to Nepalese as well as patients from India and Bangladesh.

We would like to thank all three Eye Hospitals and their team whose effort have generated this precious asset.

Thank You



**Rabindra Lal Choudhary**

CHAIRMAN  
Sagarmatha Choudhary  
Eye Hospital, Lahan



**Rajesh Kumar Kedia**

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**Bijay Kumar Singh**

CHAIRMAN  
GAUR EYE HOSPITAL  
Purenwa, Gaur

## MESSAGE FROM DIRECTORS

**“Our dedicated survey team always supported us with high positive energy and motivation. We are thankful to them and congratulate them for their hardwork.”**

It gives us immense pleasure to disseminate the report of RAAB survey 2019 of Madhesh Province conducted by joint effort of Sagarmatha Choudhary Eye Hospital(Lahan), Ram Kumar Mahabir Prasad Kedia Eye Hospital (Birganj), and Gaur Eye Hospital (Gaur).

Since the establishment of these three Hospitals, we have been able to provide high quality eye care to prevent avoidable blindness and rehabilitate incurable blindness. With the Moto of providing service to all, none of our patients go untreated due to financial issues.

We would like to thank the Provincial Gov. and Local authorities who always stood by our side and helped us strengthen Eye care service in our province.

The year had been very challenging due to COVID-19 Pandemic. However, our dedicated survey team always supported us with high positive energy and motivation. We are thankful to them and congratulate them for their hardwork.

We look forward to do better and the survey report will definitely guide us to strengthen our weaknesses and cover the untouched areas and reach other milestones.

Thank You,



**Dr. Sanjay Kumar Singh**  
Medical Director  
Sagarmatha Choudhary  
Eye Hospital, Lahan

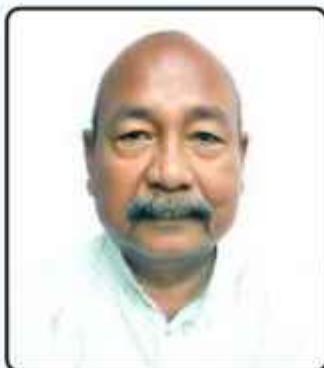


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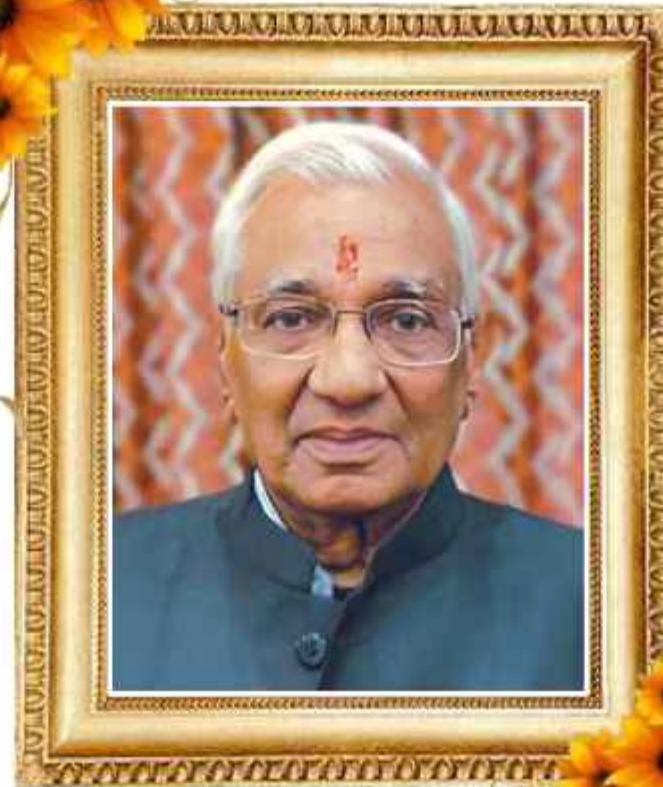


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Gaur Eye Hospital, Gaur

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*We pay our heartfelt gratitude to him for his contribution in Social Service, Industry, Trade and major contribution in ophthalmic sector of Narayani Zone. Under his leadership, ophthalmology service in Parsa district has flourished to what we see today and we are much honored to his contribution towards the RAAB survey conducted in 2019.*

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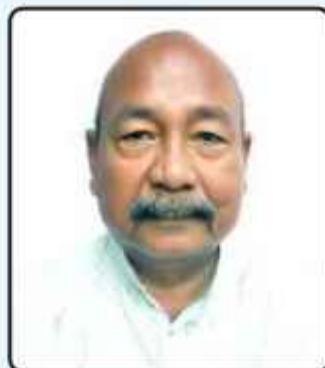
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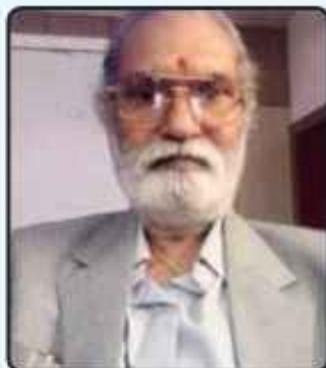


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## Abbreviations

ARMD	Age Related Macular Degeneration
BCVA	Best Corrected Visual Acuity
CI	Confidence Interval
CSC	Cataract Surgical Coverage
CSR	Cataract Surgical Rate
DR	Diabetic Retinopathy
eCSC	Effective Cataract Surgical Coverage
EVI	Early Visual Impairment
FLV	Functional Low Vision
GAP	Global Action Plan
IAPB	International Agency for Prevention of Blindness
IOL	Intra Ocular Lens
MVI	Moderate Visual Impairment
NHRC	Nepal Health Research Council
NNJS	Nepal Netra Jyoti Sangh
PVA	Presenting Visual Acuity
RAAB	Rapid Assessment of Avoidable Blindness
RBG	Random Blood Glucose
SICS	Small Incision Cataract Surgery
SVI	Severe Visual Impairment
VA	Visual Acuity
WHO	World Health Organization

## Abbreviation Definition

### Indicator

#### **DIABETIC RETINOPATHY AND MACULOPATHY**

Diabetic retinopathy	DR	An eye condition that affects blood vessels in the retina and can cause vision loss in people with diabetes
Diabetic macular oedema	DME	Swelling in the macula due to fluid leaking from blood vessels
No visible retinopathy	R0	No DR anywhere
Mild retinopathy	R1	Background retinopathy, defined as the presence of at least any of the following: <ul style="list-style-type: none"> <li>• dot haemorrhages</li> <li>• micro-aneurysms</li> <li>• hard exudates</li> <li>• cotton wool spots</li> <li>• blot haemorrhages</li> <li>• superficial or flame-shaped haemorrhages</li> </ul>
Observable retinopathy	R2	Background retinopathy, defined as four or more blot haemorrhages in one hemi-field only (inferior and superior hemi-fields delineated by a line passing through the centre of the fovea and optic disc)
Referable retinopathy	R3	Background retinopathy, defined as the presence of any of the following features: <ul style="list-style-type: none"> <li>• four or more blot haemorrhages in both inferior and superior hemi-fields</li> <li>• venous beading</li> <li>• intraretinal microvascular abnormalities (IRMA)</li> </ul>
Proliferative retinopathy	R4	Proliferative DR, defined as any of the following features: <ul style="list-style-type: none"> <li>• active new vessels</li> <li>• vitreous haemorrhage</li> </ul>
Inadequate for retinopathy No maculopathy	R6 M0	Retina not sufficiently visible for assessment No features in <2 disc diameters from the centre of the fovea sufficient to qualify for M1 or M2 as defined below
Observable maculopathy	M1	Lesions as specified below within a radius of >1 but ≤2 disc diameters the centre of the fovea
Referrable maculopathy	M2	Lesions as specified below within a radius of ≤1 disc diameter of the centre of the fovea Macula not adequately visible for assessment
Inadequate for maculopathy Sight threatening diabetic retinopathy	M6 STDR	The presence of R4 and/or M2

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We would also like to extend our gratitude to Government of Nepal, Ministry of Health, Nepal Health Research Council, CBM, IAPB, Madhesh province Govt., District Administration office, District Public Health Office, Local Municipality, Nepal Netra Jyoti Sangh Provincial and district branch committee and their members for their support to conduct this survey.

We are extremely greatful to the concerning NNJS hospitals of Madhesh province and their doctors, staffs and stakeholders involved in RAAB survey 2019 for their contribution in successful completion of this survey.

The completion of this report would not have been possible without the support of publication team and specially Mr. Prakash Kumar Verma (Sr. Hospital Manager R.M. Kedia Eye Hospital) for his devotion and contribution to prepare this book to its final structure.

Nepal Netra Jyoti Sangh  
**PROVINCIAL COMMITTEE**  
Madhesh Province

# EXECUTIVE SUMMARY

## Background

The main objective of the Rapid Assessment of Avoidable Blindness (RAAB) survey 2019 was to assess the magnitude of blindness and visual impairment, its causes and impact of existing eye care services in Madhesh Province, Nepal.

Results:

## Prevalence of Blindness and Visual Impairment

The survey achieved a 99.5% response rate. The crude prevalence of bilateral blindness from all causes among people aged 50 years and above was 1.5 % (95% CI 1.1-1.9). The crude prevalence of severe vision impairment (SVI), moderate vision impairment (MVI) and early vision impairment (EVI) were 3.3 % (95%CI 2.5-4.0), 12.5 % (95%CI 11.0-13.9) and 15.3% (95%CI 13.9-16.7) respectively.

The age- and sex-adjusted prevalence of blindness was 1.3% (95%CI 0.9-1.7). In person and in eyes 5.8% (95%CI 4.9-6.7). The age- and sex-adjusted prevalence of SVI, MVI, and EVI were 2.8% (95%CI 2.0-3.5),

11.2% (95%CI 9.8-12.6) and 14.4% (95%CI 13.0-15.7) respectively.

Based on the observed prevalence, an estimated 9,692 people aged 50 and older (4,213 men and 5,479 women) were found to be bilaterally blind in Madhesh Province. A total of 225,250 people aged 50 and older (112,310 men and 112,940 women) were estimated to have vision impairment (PVA<6/12) including blindness.

Similarly, total number of eyes affected with all causes of blindness was estimated to be 88,482 in this province. A total of 568,686 eyes were found to have vision impairment from all causes (PVA<6/12) including blindness. The prevalence of blindness in eyes < 6/60 10.2% (95%CI 9.02-11.4) < 6/18 23.3% (95%CI 21.2-25.3) < 6/12 37.4% (95%CI 35.1-39.7)

## Causes of Blindness & Visual Impairment

The main cause of bilateral blindness was untreated cataract (88.5%). Cataract was still the leading cause of SVI (91.7%) and MVI (76.7%). Uncorrected refractive error was the leading cause of EVI (67.3%).

Almost hundred percent of all blindness in the study population was avoidable. Specifically, 90.2% of blindness was treatable, 6.6% was preventable through more advanced ophthalmic services 3.3% was preventable with primary health care and/or primary eye care. Posterior segment disease accounted for 4.9% of all bilateral blindness.

Cataract surgery should be the main priority. Because blindness and vision impairment due to posterior segment diseases might be prevented through regular control and timely intervention, targeted health education and specialist ophthalmic services might contribute to reducing avoidable blindness and vision impairment further. Low vision training and services are required for the remaining 4.9% of all blindness that is permanent and untreatable.

#### **Prevalence of Cataract Causing Blindness and Vision Impairment**

The crude prevalence of blindness due to bilateral cataract among people aged 50 years and older was 1.0% (95% CI 0.7-1.3). The crude prevalence of SVI, MVI and EVI due to bilateral cataract were 3.2% (95%CI 2.5-3.8), 9.7% (95%CI 8.4-11.1) and 15.4% (95%CI 13.7-17.1) respectively.

The age- and sex-adjusted prevalence of blindness due to bilateral cataract among people aged 50 years and older was 0.8% (95%CI: 0.5-1.2) corresponding to an estimated 6,322 people aged 50 years and older blind due to cataract in Madhesh Province. We also estimated that 56,470 eyes (prevalence 3.7%) are blind due to cataract among people aged 50 years and older in Madhesh Province of Nepal.

The age- and sex-adjusted prevalence of SVI due to bilateral cataract was 1.8% (95%CI

1.2-2.3) corresponding to an estimated 13,370 people aged 50 years and older in Madhesh Province. The estimated number of eyes with SVI due to cataract was 44,998 (prevalence 3.0%) in the province.

The age- and sex-adjusted prevalence of MVI due to bilateral cataract was 5.9% (95%CI 4.9-6.9) corresponding to an estimated 44,951 people aged 50 years and older in Madhesh Province. We also estimated that 111,102 eyes (prevalence 7.3%) are affected by MVI due to cataract.

The age- and sex-adjusted prevalence of EVI due to bilateral cataract was 2.5% (95%CI 1.7-3.4) corresponding to an estimated 38,368 people aged 50 years and older in Madhesh Province. We also estimated that 84,880 eyes (prevalence 5.6%) are affected by EVI due to cataract.

The total workload of vision impairment due to bilateral cataract (BCVA<6/12 in the better eye) is estimated to be 103,009 people aged 50 years and older. The total number of eyes affected with vision impairment (BCVA<6/12) including blindness due to cataract is estimated to be 297,450 in this province.

#### **Cataract Surgical Coverage**

The cataract surgical coverage (CSC) in persons indicates which proportion of people with cataract at a predefined VA have been operated in one or both eyes. This indicator measures the coverage of cataract surgical services.

The age- and sex-adjusted CSC among people who were blind due to cataract (PVA<3/60) was 92.2% which is higher than the target of at least 85% recommended by the International Agency for the Prevention of Blindness (IAPB).

The age- and sex-adjusted CSC for eyes with cataract at a VA of <3/60 found to be 76.9%

which indicates the coverage of the total workload of operable cataract in the province.

The effective CSC (eCSC) combines coverage and outcome of cataract surgery and indicates what proportion of the people with bilateral operable cataract have been operated upon in one or both eyes and can see 6/18 or better after surgery. The eCSC among people having bilateral blindness due to cataract was 81.6%.

#### **Visual Outcome of Cataract Surgery**

In this survey, 97.8% of the total evaluated eyes had an intraocular lens (IOL) implanted. Overall good visual outcome by WHO definition was seen in 81.0% (PVA  $\geq 6/18$ ) and 87.4% (BCVA  $\geq 6/18$ ) of the cataract operated eyes. Overall poor outcome was seen in 6.9% (PVA < 6/60) and 5.5% (BCVA < 6/60) after cataract surgery.

The main causes of poor visual outcomes following cataract surgery were long term surgical complications (37.3%) and immediate surgical complications (32.7%). The other causes were ocular commodities (16.0%) and absence and/or inadequate optical correction after cataract surgery.

#### **Refractive Error, Presbyopia and Functional Low Vision**

The prevalence of refractive error was 25.9% among the people 50 years and older. Among those, 12.3% of people aged 50 years and older who had a refractive error did not have glasses. On the other hand, 83.8% of the study population did not wear glasses for near.

The age- and sex-adjusted prevalence of functional low vision (FLV) requiring low vision services in people aged 50 years and older in Madhesh Province was 0.5%

(95%CI 0.3-0.7) with an estimated 3,987 people aged 50 and older requiring low vision services.

#### **Barriers to Uptake Cataract Surgical Services**

Among the people having bilateral cataract with BCVA < 6/60, the most prominent barriers to uptake cataract surgery services were lack of felt need (49.7%), Fear (24.3%) and Cost (21.9%).

#### **Diabetes and Diabetes Retinopathy**

The total prevalence of diabetes among the people aged 50 years and above in this survey was 5.9 %. The prevalence of any grade of diabetic retinopathy was found 15.0 % among the people with diabetes.

#### **Conclusion and Recommendation**

Blindness and vision impairment from all causes still remains as a major public health problem among the people aged 50 years and above in Madhesh Province, of Nepal. There remains a significant workload of avoidable blindness and vision impairment to be addressed by the eye health system. The visual outcome of cataract surgery below the WHO standards despite more than ninety percent service coverage suggests further improvement in quality of surgical services. Huge backlog of vision impairing cataract can further be explained by the perceived barriers of lack of felt need, fear of surgery, and cost preventing the uptake of cataract surgical services among the people 50 years and older. Along with cataract as the leading causes of blindness, SVI and MVI, posterior segment diseases, uncorrected refractive error, diabetic retinopathy and functional low vision are major issues to be resolved by the eye care system in this province.

# CHAPTER-I

# INTRODUCTION

## 1.1 Background

The first nationwide epidemiological blindness survey was conducted in 1981 to estimate the prevalence and causes of blindness in Nepal. The survey was the first activity of the Nepal Blindness Prevention and Control Project, a joint initiative of the then Government of Nepal and World Health Organization. The survey estimated prevalence of bilateral blindness 0.84%, unilateral blindness 1.66% and low vision 1.85% in the Nepalese population. Cataract was found to be the leading cause of blindness accounting for 80% of all avoidable blindness<sup>(1)</sup>. The findings of the first blindness survey were enormous milestones for the development of one of the efficient and elaborate eye health systems that exists in Nepal after more than 3 decades<sup>(2)</sup>.

In 1995, a population based cross sectional study was done among 5112 people aged 45 years and above in Bheri and Lumbini zones of Nepal by using stratified cluster sampling design. The main purpose of the study was to estimate prevalence and causes of blindness and visual impairment and to assess the impact after 1981 blindness survey. The study revealed the prevalence of blindness reduced from 5.45% (in 50 years and above) in 1981 to 3.0% in population aged 45 years and above. Cataract surgical coverage among bilateral cataract blind people increased from 35.0% in 1981 to 58.0% in 1995. But, almost 30.0% of the cataract operated cases were still blind or with severe visual impairment<sup>(3)</sup>.

Two customized population based blindness surveys were conducted between 2002 and 2006 in Gandaki, Lumbini and Narayani zones of Nepal by using stratified cluster sampling and multi stage cluster

sampling techniques respectively<sup>(4,5)</sup>. The study from the Gandaki zone among 5863 people aged 45 years and above found the prevalence of blindness 2.6% and cataract as the leading cause of blindness in 60.5%. Cataract surgical coverage was found to be improved reaching to 59.5% among the cataract blind people<sup>(4)</sup>. Another population based cross sectional study conducted among 5138 people aged 50 years and above in Lumbini and Narayani zones of Nepal found the age and sex adjusted prevalence of Blindness and Visual Impairment to be 4.6% and 18.9% respectively. The overall cataract surgical coverage was found to be 66.6% among the cataract blind people<sup>(5)</sup>.

Eleven Rapid Assessment of Avoidable Blindness (RAAB) surveys were conducted from 2006-2010 in different zones of Nepal. The main purpose of these surveys was to assess the prevalence of blindness and visual impairment, to evaluate the impact of eye care delivery system of Nepal after 1981 National Blindness Survey. The prevalence of blindness was found reduced from 0.84% in 1981 to an estimated 0.35% in 2011, a 58% reduction. Cataract was still found to be the leading cause of blindness and quality of cataract surgery improved but still did not meet the WHO standard<sup>(6)</sup>.

Towards Universal Eye Health: A Global Action Plan (GAP) 2014-2019 was endorsed and adopted by its member countries at the Sixty Sixth World Health Assembly in 2013 in Geneva, Switzerland. The vision of the global action plan is a world in which nobody is needlessly visually impaired, where those with unavoidable vision loss can achieve their full potential, and where there is universal access to comprehensive eye care services<sup>(7)</sup>.

Nepal has already been one of the

signatories of the Global Action Plan 2014-2019 at the World Health Assembly in 2013 and has complied to operationalize the global target of reducing prevalence of avoidable visual impairment by 25% from the baseline of 2010 by 2019. It strongly recommends conducting population based surveys to provide evidences on magnitude and causes of blindness and visual impairment for planning and evaluating impact of eye health programs.

More than 80% of the avoidable blindness and visual impairment resides among the people aged 50 years and above mainly caused by cataract and uncorrected refractive errors alone<sup>8</sup>. So, the greatest gains will be achieved through reduction of prevalence of avoidable visual impairment among the population aged 50 years and above.

### 1.2 Problem Statement

There is paucity of current evidence on the prevalence, trend and causes of visual impairment in Nepal since the completion of population surveys in 2010 to inform the evidence based decision making for formulating plans, policies and strategies to accomplish the unfinished agenda of The Vision 2020: The Right to Sight, a global initiative of the World Health Organization (WHO) and International Agency for Prevention of Avoidable Blindness (IAPB).

Madhesh Province is one of seven provinces of the Federal Democratic Republic of Nepal as provisioned by the new constitution which came on effect on September 2015. The total area of the province is 9661 square kilometers making it the smallest province in Nepal by area. According to the 2011 Nepal census, the population of the province is 5,404,145 making it the second most populous province in Nepal. The total number of people 50 years and above in this province is 760,911 (male 397,182 and female 363,729).

In the new political and administration system, health service delivery is the main responsibility of provincial government. Hence, a population based RAAB survey was conducted for assessing the prevalence and causes of blindness and visual impairment in this province in order to provide the evidence for monitoring the target set by the WHO GAP 2014-2019.

### 1.3 Rational of the Survey

The survey aimed to assess the prevalence of blindness and visual impairment among the selected participants of aged 50 years and above in the Madhesh Province of Nepal by using RAAB survey methodology. The findings from this survey will inform the decision makers to plan universal, equitable and sustainable eye care policies and programs for the future.

### 1.4 General Objective

The main objective of the survey was to assess the magnitude and causes of blindness and visual impairment among people 50 years and above, impact of eye care services, in Madhesh Province of Nepal by using epidemiologically sound survey methodology.

### 1.4.1 Specific Objectives

The specific objectives of the survey were to assess:

- Prevalence of blindness and visual impairment from all causes
- Prevalence of blindness and visual impairment from avoidable causes
- Prevalence of blindness and visual impairment from cataract
- Main causes of blindness and visual impairment
- Cataract surgical coverages
- Visual outcomes of cataract surgery
- Cause of poor outcome after surgery
- Barriers to cataract surgical services
- Prevalence of uncorrected refractive errors, presbyopia and low vision
- Prevalence of diabetic retinopathy.

# CHAPTER-II

# METHODOLOGY

This cross sectional population based blindness survey was conducted in Madhesh Province of Nepal by using standardized RAAB methodology in 2019. It was accomplished with the technical support from the International Agency for Prevention of Avoidable Blindness, South East Asia.

## 2.1 Study Population

The study population was adults living in Madhesh Province who were aged 50 years or older at the time of data collection

## 2.2 Sampling Frame

The national census data of 2011 was used for creating the sampling frame. Based on the census data, ward level population was used as population units/clusters.

## 2.3 Sample Size

The total sample size required was 4075 people, distributed across 117 clusters of 35 people 50 years or older in each. Sample size calculations were performed using the RAAB7 software. We assumed a prevalence of bilateral blindness of 2.5% (P). This was based on the observed prevalence of blindness in Nepal in the previous RAAB survey, a worst tolerable alfa error consideration of 20% (D), 95% confidence level ( $Z=1.96$ ), and 10% non-response rate. The formula used for the sample size calculation was  $N = (1.96)^2(P(1-P))/D^2$ . As we used cluster sampling, adjusting cluster design effect of 1.4 for the cluster size of 35 people with 10% non-response rate required sample size was 4075 people. In order to enroll adequate sample in the survey, a total of 117 clusters were randomly selected from the sampling frame

according to population proportionate to size.

## 2.4 Recruitment Approach

The sampling frame for the survey was a list of wards, obtained from the 2011 census data. Each ward was considered a cluster. A total of 162 clusters were randomly selected using a probability proportionate to size approach based on the clusters' population size.

The survey teams, accompanied by a local guide, visited all households in the selected clusters door-to-door until 35 people aged 50 years or older were identified. The purposes of the study and examination procedure were explained to the subjects and informed consent was sought before data collection.

In cases where an eligible person lived in one of the visited households but was not present at the time of data collection, the survey team returned to their household once again on the same day to examine them. If they still could not be examined, information about their visual status was collected from relatives or neighbours. If the data collection team visited all households in a cluster but failed to identify 35 eligible residents, then the team continued recruitment in the closest cluster.

## 2.5 Data Collection Process

Three teams were trained for data collection in this survey. In the selected clusters, the team led by an Ophthalmologist visited house to house to enroll the eligible survey participants. After informed written consent, the eligible survey participants underwent visual acuity assessment, anterior segment examination with torch light and media and fundus

examination with direct ophthalmoscope. The data collection was done in tablets with mRAAB7 data collection software installed.

In this survey, we also included the Diabetic Retinopathy module of RAAB7. All eligible participants also underwent for blood glucose test. Participants with random blood glucose 200 mg/dl and known diabetic participants also underwent detail fundus examination to assess the Diabetic Retinopathy.

## 2.6 Ethical Consideration

The survey confirms to the tenets of the Declaration of Helsinki. The survey protocol was reviewed and approved by Nepal Health Research Council under the Ministry of Health, Government of Nepal. Before enrollment and examination, all eligible participants were explained about the purpose and procedures of the survey. Written informed consent was taken from each respondent to voluntarily participate in data collection and examination procedures. Appropriate remedial actions were taken to address any eye and other health related problems if found among the participants.

## 2.7 Operational Definitions

We will refer to key indicators of eye health throughout the remainder of this report. In this section, we provide a list of abbreviations as well as the definition of key indicators used.

**Blindness** : A study participant having presenting visual acuity (PVA) < 3/60 in the better was considered as blind.

**Presenting Visual Acuity(PVA)** : Visual Acuity measured with available correction if any.

**Best Corrected Visual Acuity(BCVA)** : Visual Acuity measured and recorded after pinhole correction. Blindness and Visual Impairment due to cataract in this survey were based on the BCVA.

**Severe Visual Impairment(SVI)** : Presenting Visual Acuity of < 6/60 – 3/60 in the better eye was considered as SVI.

**Moderate Visual Impairment(MVI)** : Presenting Visual Acuity of < 6/18 – 6/60 in the better eye was considered as MVI.

**Early Visual Impairment(EVI)** : Mild visual impairment with presenting visual acuity of <6/12 – 6/18 in the better eye was considered as EVI.

**Functional Low Vision (FLV)** : Best corrected visual acuity of < 6/18 – PL+ in the better eye (not due to cataract or refractive error) was considered as FLV.

# CHAPTER-III

## FINDINGS

### **3.1 Response Rate**

The survey included 4,075 people aged 50 years and older, of whom 4,055 were examined. The coverage was 99.5%. A total of 20 (0.5%) eligible individuals were not evaluated for the study purpose due to unavailability, self-refusals and for not being capable to communicate. (Table 1)

**Table 1: Eligible Participants, Coverage and Refusals**

Study Participants	Examined		Not Available		Refused		Not Capable		Total Enrolled	
	n	%	n	%	n	%	n	%	n	%
Male	1,897	99.5	5	0.3	3	0.2	2	0.1	1,907	100.0
Female	2,158	99.5	1	0.0	7	0.3	2	0.1	2,168	100.0
Total	4,055	99.5	6	0.1	10	0.2	4	0.1	4,075	100.0

### **3.2 Representativeness of Sample Population**

To check whether the study population is representative of the Nepalese population aged 50 years and older, the age and sex composition of the sample was compared with that of broader population of Madhesh Province.

Ideally, the study population should have the same composition by age and by sex as the total population aged 50 years and older in the survey area. However, we found that men and women aged 70 years and older in the study population were over-represented, and men and women younger than 70 years were under-represented (Table 2).

To account for these discrepancies, we have provided both crude (study population) and age- and sex-adjusted estimates where appropriate.

**Table 2: Age and Sex Composition of Province and Sample Population**

Age and Sex Composition of the Sample Population						
Age Group	Male		Female		Total	
	n	%	n	%	n	%
50-59	717	37.8	886	41.1	1,603	39.5
60-69	648	34.2	716	33.2	1,364	33.6
70-79	415	21.9	480	22.2	895	22.1
80 above	117	6.2	76	3.5	193	4.8
Total	1,897	100.0	2,158	100.0	4,055	100.0
Age and Sex Composition of the Province						
50-59	185,999	46.8	169,254	46.5	355,253	46.7
60-69	137,973	34.7	128,931	35.4	266,904	35.1
70-79	59,585	15.0	52,101	14.3	111,686	14.7
80 above	13,625	3.4	13,443	3.7	27,068	3.6
Total	397,182	100.0	363,729	100.0	760,911	100.0

### 3.3 Crude Prevalence of Blindness and Visual Impairment

The crude prevalence of blindness with available correction was 1.5% (95%CI 1.1-1.9). The crude prevalence of severe vision impairment (SVI), moderate vision impairment (MVI) and early vision impairment (EVI) were 3.3% (95%CI 2.5-4.0), 12.5% (95%CI 11.0-13.9) and 15.3% (95%CI 13.9-16.7) respectively. The crude prevalence of functional low vision (FLV) was 0.6% (95%CI 0.4-0.8). Although not statistically significant, prevalence of blindness and vision impairment was higher in women than in men (Table 3).

**Table 3: Crude Prevalence of Blindness and Vision Impairment**

Vision Category	Male, %(95% CI)	Female , %(95% CI)	All , %(95% CI)
Blindness	1.3 (0.7 – 1.8)	1.7 (1.1 – 2.3)	1.5 (1.1 – 1.9)
SVI	2.9 (1.9 – 3.8)	3.6 (2.7 – 4.5)	3.3 (2.5 – 4.0)
MVI	12.3 (10.5 – 14.1)	12.6 (10.9 – 14.3)	12.5 (11.0 – 13.9)
EVI	15.2 (13.4 – 17.0)	15.4 (13.6 – 17.2)	15.3 (13.9 – 16.7)
FLV	0.7 (0.4 – 1.1)	0.4 (0.2 – 0.7)	0.6 (0.4 – 0.8)

### 3.4 Prevalence of Blindness According to Age Group

The prevalence of blindness among survey participants aged 50 years and above was 1.5% (95%CI 1.1-1.9) and increased with age. The prevalence of bilateral blindness was found maximum 6.2% (95%CI 3.0-9.4) among the participants aged 80 years and above (Table 4).

**Table 4: Prevalence of Blindness According to Age Group**

Age Group	Male			Female			Total		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
50 – 59	6	0.8	0.2-1.5	5	0.6	0.1-1.1	11	0.7	0.3-1.1
60 – 69	3	0.5	0.0-1.1	8	1.1	0.4-1.9	11	0.8	0.2-1.4
70 – 79	10	2.4	0.8-4.0	17	3.5	1.8-5.2	27	3.0	1.8-4.2
80 above	5	4.3	0.8-7.8	7	9.2	3.2-15.3	12	6.2	3.0-9.4
Total	24	1.3	0.7-1.8	37	1.7	1.1-2.3	61	1.5	1.1-1.9

### 3.5 Age and Sex Adjusted Prevalence for All Causes of Blindness and Visual Impairment

The age- and sex-adjusted prevalence of blindness with available correction was 1.3% (95%CI 0.9-1.7). The age- and sex-adjusted prevalence of SVI, MVI, and EVI were 2.8% (95%CI 2.0-3.5), 11.2% (95%CI 9.8-12.6) and 14.4% (95%CI 13.0-15.7) respectively. The age- and sex-adjusted prevalence of FLV was 0.5% (95%CI 0.3-0.7) and crude prevalence was 0.6% (95%CI 0.42-0.8) (Table5).

Based on the observed prevalence, an estimated 9,692 people aged 50 and older (4,213 men and 5,479 women) were found to be bilaterally blind in Madhesh Province. A total of 225,250 people aged 50 and older (112,310 men and 112,940 women) were estimated to have vision impairment (PVA<6/12) including blindness. An estimated 3,987 people aged 50 and older (2,428 men and 1,559 women) were found to have permanent low vision requiring low vision services (Table5).

Similarly, total number of eyes affected with all causes of blindness was estimated to be 88,482 in this province. A total of 568,686 eyes were found to have vision impairment including blindness (Table5).

**Table 5: Age & Sex Adjusted Prevalence for All Causes of Blindness & Vision Impairment**

PVA Category	Age and Sex Adjusted Prevalence for All Causes of Blindness and VI - Persons								
	Male			Female			All		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
Blindness	4,213	1.1	0.5-1.6	5,479	1.5	0.9-2.1	9,692	1.3	0.9-1.7
SVI	9,190	2.3	1.4-3.3	11,870	3.3	2.4-4.2	21,060	2.8	2.0-3.5
MVI	43,345	10.9	9.1-12.7	41,845	11.5	9.8-13.2	85,190	11.2	9.8-12.6
EVI	55,561	14.0	12.2-15.8	53,747	14.8	13.0-16.6	109,308	14.4	13.0-15.7
FLV	2,428	0.6	0.2-1.0	1,559	0.4	0.2-0.7	3,987	0.5	0.3-0.7
Age and Sex Adjusted Prevalence for All Causes of Blindness and VI – Eyes									
Blindness	45,450	5.7	4.7-6.7	43,032	5.9	4.8-7.0	88,482	5.8	4.9-6.7
SVI	31,224	3.9	2.9-5.0	35,652	4.9	3.9-5.9	66,876	4.4	3.6-5.2
MVI	100,198	12.6	10.9-14.3	98,613	13.6	12.0-15.1	198,811	13.1	11.7-14.4
EVI	109,014	13.7	12.2-15.2	105,504	14.5	12.9-16.1	214,518	14.1	12.9-15.3

### 3.6 Causes of Blindness and VI in the Study Population

The main cause of bilateral blindness was untreated cataract (88.5%). The other causes were non-trachomatous corneal opacity (3.3%), glaucoma (3.3%), cataract surgical complications (1.6%), aphakia untreated (1.6%) and diabetic retinopathy (1.6%). Cataract was still the leading cause of SVI (91.7%) and MVI (76.7%). Uncorrected refractive error was the leading cause of EVI (67.3%) (Table 6).

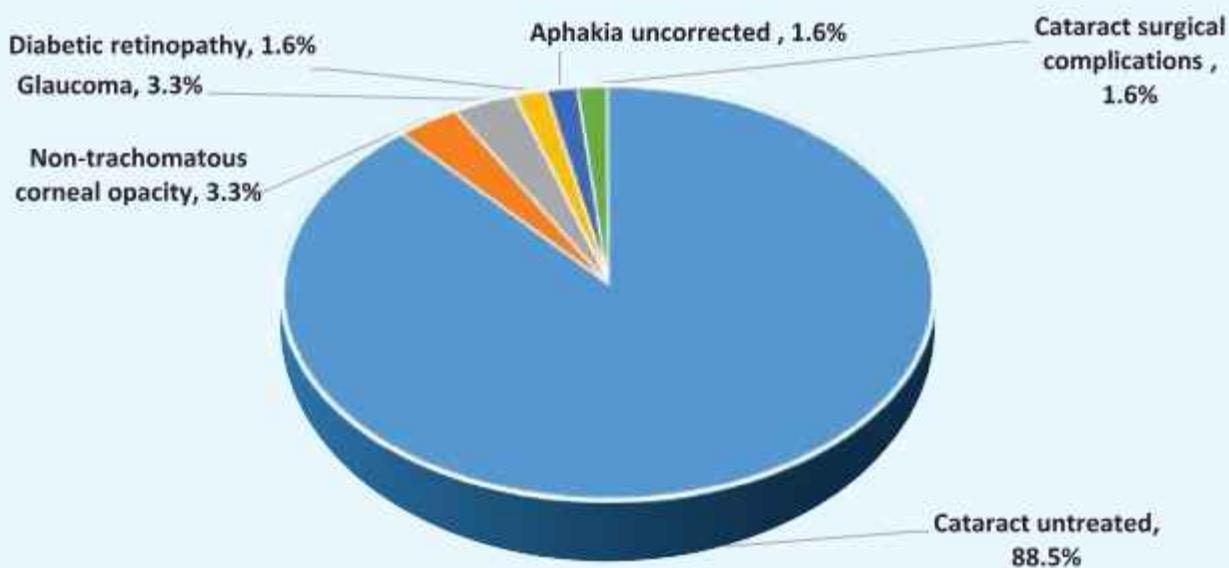
The proportion of blindness due to glaucoma was 3.3%. However, it should be noted that with glaucoma the central vision remains unaffected until very late in the disease process. It is not possible to conduct reliable visual field analysis in this survey. The number of patients who have glaucoma and still have normal VA is likely to be higher.

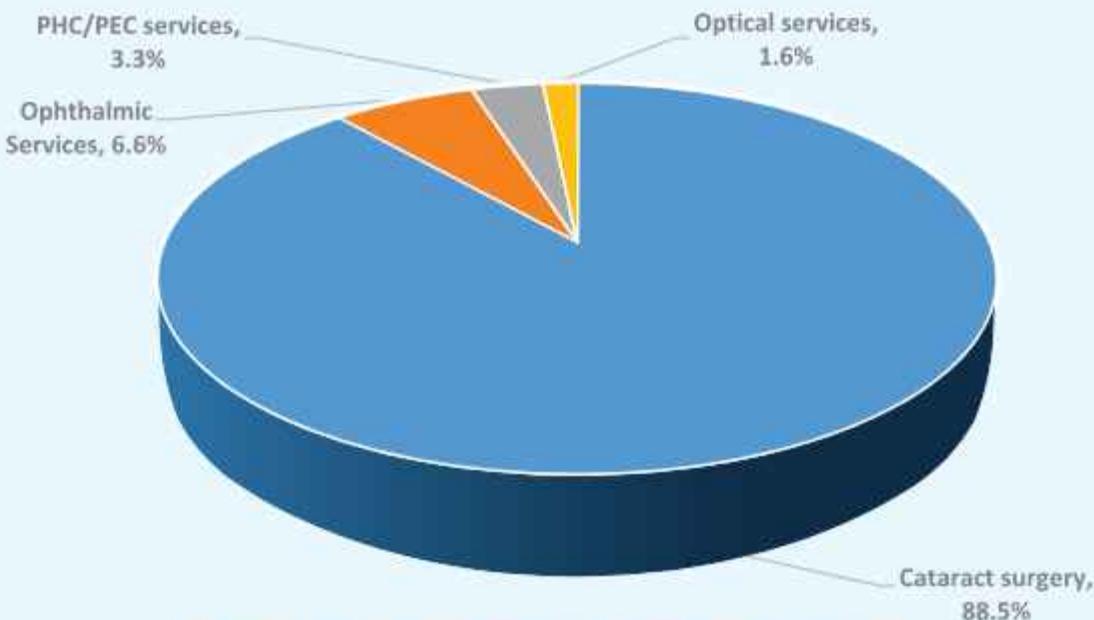
Almost hundred percent of all blindness in the study population was avoidable. Specifically, 90.2% of blindness was treatable, 6.6% was preventable through more advanced ophthalmic services and 3.3% was preventable with primary health care and/or primary eye care. Posterior segment disease accounted for only 4.9% of all bilateral blindness (Table 6).

The main intervention strategies to reduce avoidable blindness in Madhesh Province are shown in Figure 4. Cataract surgery should be the main priority. Because blindness and vision impairment due to posterior segment diseases like glaucoma, diabetic retinopathy and ARMD might be prevented through regular control and timely intervention, targeted health education and the development of specialist ophthalmic services might contribute to reducing avoidable blindness and vision impairment further.

**Table 6: Causes of Blindness and VI in Sample Population**

Category	Blindness		SVI		MVI		EVI	
	n	%	n	%	n	%	n	%
<b>By cause</b>								
Cataract untreated	54	88.5	121	91.7	388	76.7	170	27.4
Non-trachomatous corneal opacity	2	3.3	2	1.5	5	1.0	7	1.1
Glaucoma	2	3.3	1	0.8	3	0.6	1	0.2
Diabetic retinopathy	1	1.6	0	0.0	1	0.0	1	0.2
Aphakia uncorrected	1	1.6	0	0.0	0	0.0	0	0.0
Cataract surgical complications	1	1.6	5	3.8	29	5.7	21	3.4
Refractive error	0	0.0	1	0.8	78	15.4	417	67.3
Phthisis	0	0.0	0	0.0	0	0.0	2	0.0
ARMD	0	0.0	0	0.0	2	0.4	1	0.2
Other posterior segment diseases	0	0.0	2	1.5	0	0.0	0	0.0
Total	61	100.0	132	100.0	506	100.0	620	100.0
<b>By intervention category</b>								
A. Treatable	55	90.2	122	92.4	466	92.1	587	94.7
B. Preventable (PHC/PEC services)	2	3.3	2	1.5	5	1.0	9	1.5
C. Preventable (Ophthalmic services)	4	6.6	6	4.6	33	6.5	23	3.7
D. Avoidable (A+B+C)	61	100.0	130	98.5	504	99.6	619	99.8
E. Posterior segment causes	3	4.9	3	2.3	6	1.2	3	0.5

**Figure 1: Causes of Blindness**



**Figure 2 : Actions required to reduce blindness**

### 3.7 Crude Prevalence of Blindness and Visual Impairment due to Cataract

The crude prevalence of blindness due to bilateral cataract among people aged 50 years and older was 1.0% (95% CI 0.7-1.3). The crude prevalence of eyes that are blind from cataract was 4.3% (95%CI 2.5-3.6) (Table 7).

The crude prevalence of SVI due to bilateral cataract was 3.2% (95%CI 2.5-3.8). The crude prevalence of eyes affected by SVI due to cataract was 7.8% (95%CI 6.8-8.7) (Table 7).

The crude prevalence of MVI due to bilateral cataract was 9.7% (95%CI 8.4-11.1). The crude prevalence of eyes that are affected by MVI due to cataract was 15.8% (95%CI 14.2-17.3) (Table 7).

The crude prevalence of EVI due to bilateral cataract was 15.4% (95%CI 13.7-17.1). The crude prevalence of eyes that are affected by EVI due to cataract was 22.0% (95%CI 20.1-23.8) (Table 7).

Although not significantly different, the survey suggests that the prevalence of bilateral blindness due to cataract is greater among women than men.

**Table 7: Crude Prevalence of Blindness and Visual Impairment due to Cataract**

	Male			Female			Total		
	n	%	95%CI	n	%	95%CI	n	%	95%CI
<b>Cataract causing blindness</b>									
Bilateral cataract	17	0.9	0.5-1.3	24	1.1	0.6-1.6	41	1.0	0.7-1.3
Unilateral cataract	120	6.3	4.9-7.7	145	6.7	5.4-8.0	265	6.5	5.4-7.7
Cataract eyes	154	4.1	2.2-3.4	193	4.5	2.5-4.0	347	4.3	2.5-3.6
<b>Cataract causing SVI</b>									
Bilateral cataract	43	2.3	1.6-3.0	85	3.9	2.9-4.9	128	3.2	2.5-3.8
Unilateral cataract	176	9.3	6.3-8.9	198	9.2	7.7-11.1	374	9.2	7.3-9.7
Cataract eyes	262	6.9	5.9-7.9	368	8.5	7.2-9.9	630	7.8	6.8-8.7
<b>Cataract causing MVI</b>									
Bilateral cataract	166	8.8	7.1-10.4	229	10.6	8.8-12.4	395	9.7	8.4-11.1
Unilateral cataract	241	12.7	10.9-14.5	249	11.5	10.0-13.1	490	12.1	10.8-13.4
Cataract eyes	573	15.1	13.2-17.0	707	16.4	14.4-18.4	1,280	15.8	14.2-17.3
<b>Cataract causing EVI</b>									
Bilateral cataract	266	14.0	11.9-16.1	358	16.6	14.5-18.7	624	15.4	13.7-17.1
Unilateral cataract	265	14.0	12.3-15.7	268	12.4	10.8-14.0	533	13.1	11.9-14.4
Cataract eyes	797	21.0	18.8-23.2	984	22.8	20.5-25.1	1,781	22.0	20.1-23.8

### 3.8 Age and Sex Adjusted Prevalence of Cataract Causing Blindness and VI

The age- and sex-adjusted prevalence of blindness due to bilateral cataract among people aged 50 years and older was 0.8% (95%CI: 0.5-1.2). We therefore estimated that 6,322 people (2,907 men and 3,415 women) aged 50 years and older are blind due to cataract in Madhesh Province. Although not significantly different, the survey suggests that the prevalence of bilateral blindness due to cataract is greater among women than men. The age- and sex-adjusted prevalence of eyes that are blind from cataract was 3.7% (95%CI 3.0-4.4) with an estimated 56,470 eyes blind due to cataract among people aged 50 years and older in Madhesh Province of Nepal (Table 8).

The age- and sex-adjusted prevalence of SVI due to bilateral cataract was 1.8% (95%CI 1.2-2.3) corresponding to an estimated 13,370 people aged 50 years and older in Madhesh Province. The age and sex adjusted prevalence of eyes affected by SVI due to cataract was 3.0% (95%CI 2.3-3.6) corresponding to an estimated 44,998 affected eyes in the province (Table 8).

The age- and sex-adjusted prevalence of MVI due to bilateral cataract was 5.9% (95%CI 4.9-6.9) corresponding to an estimated 44,951 people aged 50 years and older in Madhesh Province. We also estimated that 111,102 eyes (prevalence 7.3%) are affected by MVI due to cataract (Table 8).

The age- and sex-adjusted prevalence of EVI due to bilateral cataract was 2.5% (95%CI 1.7-3.4) corresponding to an estimated 38,368 people aged 50 years and older in Madhesh Province. We also estimated that 84,880 eyes (prevalence 3.7%) are affected by EVI due to cataract (Table 8).

The total workload of vision impairment due to bilateral cataract (BCVA<6/12 in the better eye) is estimated to be 103,009 people aged 50 years and older. The total number of eyes affected with vision impairment (BCVA<6/12) including blindness due to cataract is estimated to be 297,450 in this province.

**Table 8: Age and Sex Adjusted Prevalence of Cataract Causing Blindness and VI**

Cataract Causing Bilateral Blindness and VI in persons									
Category	Male			Female			All		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
<b>Blindness</b>	2,907	0.7	0.3-1.1	3,415	0.9	0.4-1.5	6,322	0.8	0.5-1.2
<b>SVI</b>	4,319	1.1	0.5-1.6	9,051	2.5	1.7-3.3	13,370	1.8	1.2-2.3
<b>MVI</b>	22,177	5.6	4.2-6.9	22,774	6.3	5.1-7.4	44,951	5.9	4.9-6.9
<b>EVI</b>	18,455	2.3	1.1-3.5	19,913	2.7	1.6-3.8	38,368	2.5	1.7-3.4
Cataract Causing Blindness and VI in eyes									
<b>Blindness</b>	28,055	3.5	2.7-4.3	28,415	3.9	3.0-4.8	56,470	3.7	3.0-4.4
<b>SVI</b>	18,308	2.3	1.6-3.0	26,690	3.7	2.8-4.6	44,998	3.0	2.3-3.6
<b>MVI</b>	57,519	7.2	5.8-8.7	53,583	7.4	6.2-8.5	111,102	7.3	6.3-8.3
<b>EVI</b>	41,897	5.3	4.3-6.3	42,983	5.9	4.9-7.0	84,880	5.6	4.8-6.4

### 3.9 Cataract Surgical Coverage

The cataract surgical coverage (CSC) in persons indicates which proportion of people with cataract at a predefined VA have been operated in one or both eyes. This indicator measures the coverage of cataract surgical services.

At 92.2%, the age- and sex-adjusted CSC among people who are blind (PVA <3/60) is higher than the target of at least 85% recommended by the International Agency for the Prevention of Blindness (IAPB). The age- and sex-adjusted CSC was slightly higher in men (92.8%) compared with women (91.6%) (Table 9).

The age- and sex-adjusted CSC among people at a VA of <6/60 and <6/18 are 81.0% and 61.5%, respectively. This suggests that fewer people who have cataract receive surgery if they are not blind (Table 9).

The age- and sex-adjusted CSC for eyes with cataract (as opposed to individuals with cataract) at a VA of <3/60 indicates the coverage of the total workload of operable cataract. This is 76.9%, with slightly higher coverage in men (77.7%) than in women (76.3%) (Table 9).

The effective CSC (eCSC) combines coverage and outcome of cataract surgery and indicates what proportion of the people with bilateral operable cataract have been operated upon in one or both eyes and can see 6/18 or better after surgery.

The eCSC among people who are blind due to cataract was 81.6%. The eCSC among people with a VA of <6/60 and <6/18 are 71.7% and 53.9%, respectively (Table 9).

**Table 9: Cataract Surgical Coverage**

Vision Category	Male	Female	Total
<b>Cataract Surgical Coverage (Persons) – percentages</b>			
VA <3/60	92.8	91.6	92.2
VA <6/60	85.4	77.5	81.0
VA <6/18	63.8	59.5	61.5
<b>Cataract Surgical Coverage (Eyes) – percentages</b>			
VA <3/60	77.7	76.3	76.9
VA <6/60	67.2	62.8	64.7
VA <6/18	48.3	46.7	47.5
<b>Effective Cataract Surgical Coverage (persons)- percentages</b>			
VA <3/60	83.1	80.4	81.6
VA <6/60	76.3	68.2	71.7
VA <6/18	56.0	52.1	53.9

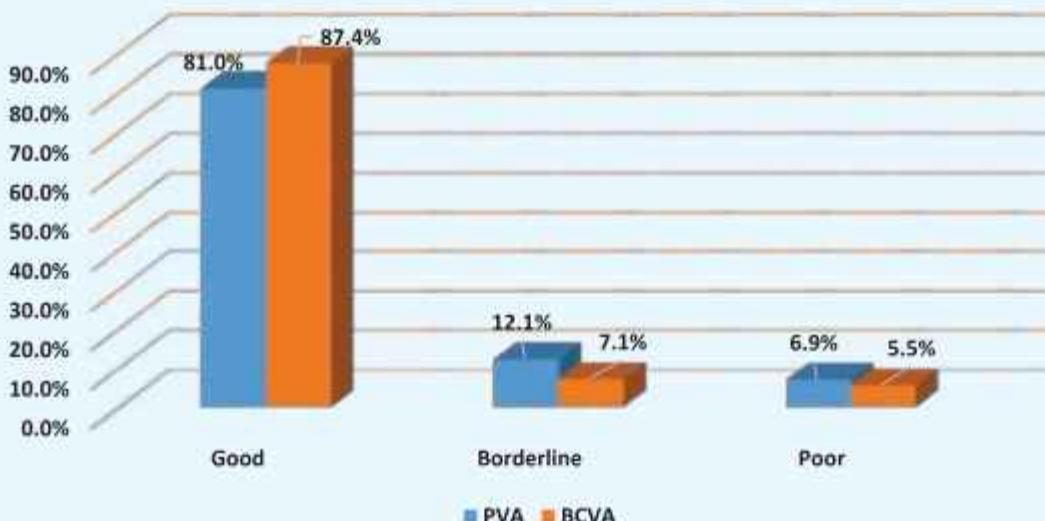
### 3.10 Visual Outcome of Cataract Surgery

In this survey 1,157 eyes had cataract surgery, 1,132 (97.8%) eyes had an intraocular lens (IOL) implanted and 25(2.2%) eyes did not have an IOL. Overall good visual outcome by WHO definition was seen in 81.0% (PVA  $\leq$ 6/18) and 87.4% (BCVA  $\leq$ 6/18) of the cataract operated eyes. Overall poor outcome was seen in 6.9% (PVA <6/60) and 5.5% (BCVA <6/60) after cataract surgery. The difference between PVA and BCVA can be minimized by adequate biometry, good surgical technique, individually adjusted IOLs, and optical correction after cataract surgery (Table 10 and Figure 7).

**Table 10: Visual Outcome of Cataract Surgery in the Study Population**

Visual outcome	VA Type	Non-IOL		IOL		Total	
		n	%	n	%	n	%
Very good $\geq$ 6/12	PVA	3	12.0	773	68.3	776	67.1
	BCVA	6	24.0	902	79.7	908	78.5
Good: $\geq$ 6/18	PVA	2	8.0	159	14.0	161	13.9
	BCVA	4	16.0	99	8.7	103	8.9
Borderline: <6/18 - 6/60	PVA	1	4.0	139	12.3	140	12.1
	BCVA	2	8.0	80	7.1	82	7.1
Poor: < 6/60	PVA	19	76.0	61	5.4	80	6.9
	BCVA	13	52.0	51	4.5	64	5.5

\* PVA = Presenting visual acuity, \*BCVA = Best Corrected Visual Acuity

**Figure 3: Visual outcome of cataract surgery**

### 3.11 Visual Outcome of Cataract Surgery According to Postoperative period

As expected, the proportion of very good or good outcome is highest among those who were undergone cataract surgery in last 3 years (86.3%) and lowest among those who were undergone cataract surgery in last 7 years or more (73.7%) (Table 11).

**Table 11: Visual Outcome of Cataract Surgery According to Postoperative period**

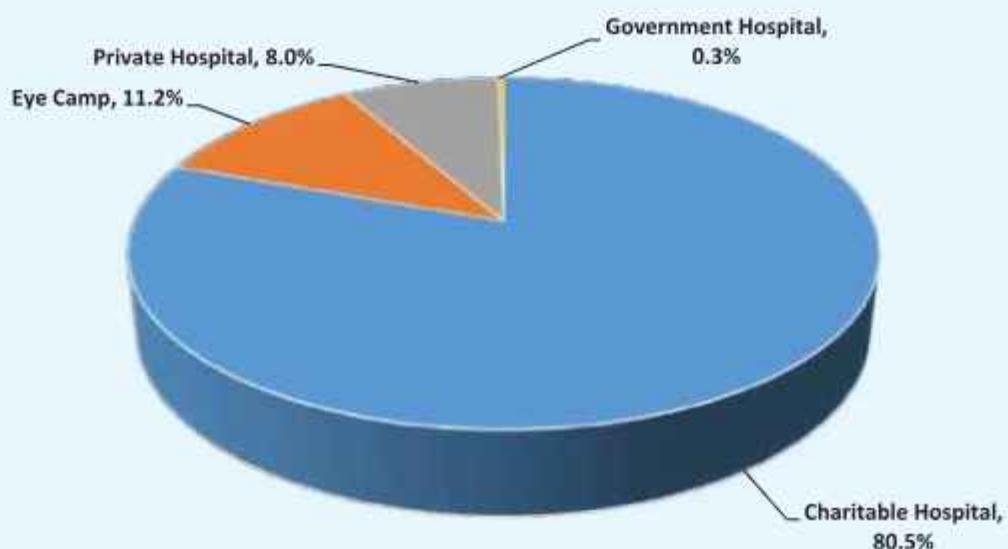
Category PVA	Visual Outcome in Cataract Operated Eyes by years after surgery ( n=1,157)						Total
	n	%	n	%	n	%	
Very Good ≥6/12	321	71.0	233	68.5	222	60.8	776 67.1
Good : ≥6/18	69	15.3	45	13.2	47	12.9	161 13.9
Borderline :<6/18 - 6/60	37	8.2	45	13.2	58	15.9	140 12.1
Poor : < 6/60	25	5.5	17	5.0	38	10.4	80 6.9
Total	452	100.0	340	100.0	365	100.0	1,157 100.0

### 3.12 Visual Outcome of Cataract Surgery According to Place of Surgery

Most patients were operated in charitable eye hospitals (80.5%), whilst others received surgery in eye camps (11.2%), private eye hospitals (8.0%), and government hospitals (0.3%) (Table 12).

**Table 12: Proportion of Cataract Surgeries Performed According to Places**

Places of Surgery	Male		Female		Total	
	n	%	n	%	n	%
Government Hospital	3	0.6	1	0.2	4	0.3
Voluntary/Charitable Hospital	441	82.3	490	78.9	931	80.5
Private Hospital	46	8.6	46	7.4	92	8.0
Eye Camp	46	8.6	84	13.5	130	11.2
Total	536	100.0	621	100.0	1,157	100.0

**Figure 4: Proportion of Cataract Surgeries Performed According to Places**

The proportion of surgeries with a very good or good outcome was highest in government hospitals (100.0 %) followed by private hospitals (85.9%), charitable hospitals (81.9%), and eye camps (70.7%) respectively (Table 13).

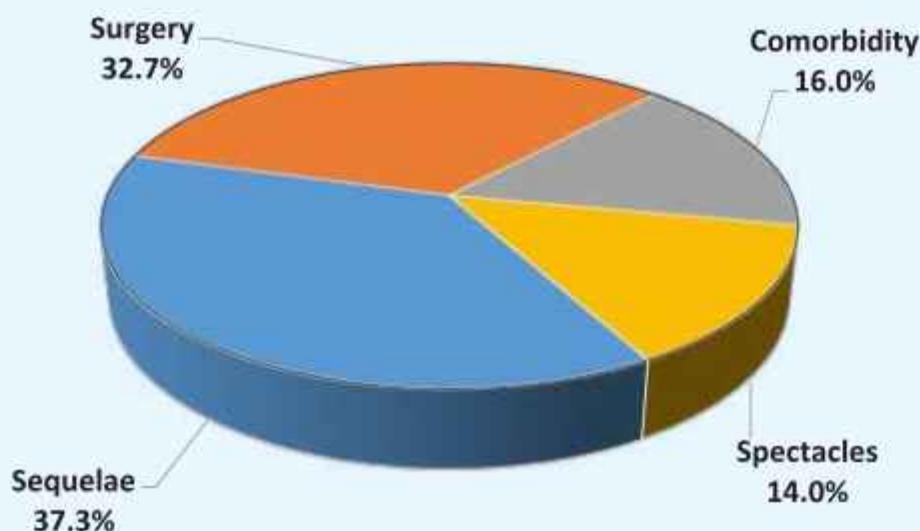
**Table 13: Post-Operative Visual Outcome According to Place of Surgery**

Visual Outcome (PVA)	Government Hospital		Charitable Hospital		Private Hospital		Eye Camps		Total	
	n	%	n	%	n	%	n	%	n	%
Very good : $\geq 6/12$	4	100.0	633	68.0	72	78.3	67	51.5	776	67.1
Good : $\geq 6/18$	0	0.0	129	13.9	7	7.6	25	19.2	161	13.9
Borderline : $<6/18-6/60$	0	0.0	104	11.2	9	9.8	27	20.8	140	12.1
Poor : $< 6/60$	0	0.0	65	7.0	4	4.3	11	8.5	80	6.9
Total	4	100.0	931	100.0	92	100.0	130	100.0	1,157	100.0

The main causes of poor visual outcomes following cataract surgery were long term surgical complications (37.3%) and immediate surgical complications (32.7%). The other causes were ocular comorbidities (16.0%) and absence and/or inadequate optical correction after cataract surgery (Table 14).

**Table 14: Causes of Poor Outcome among Cataract Operated Eyes**

Causes	Borderline Outcome		Poor Outcome		Total	
	n	%	n	%	n	%
Comorbidity	13	9.3	22	27.5	35	16.0
Surgery	46	32.8	26	32.5	72	32.7
Spectacles	23	16.4	8	10.0	31	14.0
Sequelae	58	41.5	24	30.0	82	37.3
Total	140	100.0	80	100.0	220	100.0

**Figure 5: Causes of poor outcome among cataract operated eyes**

### 3.13 Barriers to Uptake Cataract Surgical Services

Among the people having bilateral cataract with BCVA <6/60, the most prominent barriers to uptake cataract surgery services were lack of felt need (49.7%), Fear of surgery (24.3%) and Cost (21.9%) (Table 15).

**Table 15: Barriers to Uptake Cataract Surgical Services**

Barriers	Men		Women		Total	
	n	%	n	%	n	%
Need not felt	27	49.1	57	50.0	84	49.7
Fear	14	25.5	27	23.7	41	24.3
Cost	13	23.6	24	21.1	37	21.9
Treatment denied by provider	1	1.8	6	5.3	7	4.1
Total	55	100.0	114	100.0	169	100.0

### 3.14 Refractive Error in People Aged 50 Years and Older

The prevalence of refractive error was 25.9% among the people 50 years and older. Among those, 12.3% of people aged 50 years and older who had a refractive error did not have glasses. On the other hand, 83.8% of the study population did not wear glasses for near. The prevalence of uncorrected refractive error was slightly higher in men than in women. More women (88.0%) than men (79.0) were uncorrected for their near vision (Table 16).

**Table 16: Prevalence of Uncorrected Refractive Error and Uncorrected Presbyopia**

Types	Male		Female		Total	
	n	%	n	%	n	%
Total Refractive Error	549	28.9	502	23.3	1,051	25.9
Uncorrected Refractive Error	241	12.7	256	11.9	497	12.3
Total Presbyopia	1,897	100.0	2,158	100.0	4,055	100.0
Uncorrected Presbyopia	1,498	79.0	1,900	88.0	3398	83.8

### 3.15 Functional Low Vision Requiring Low Vision Services

The age- and sex-adjusted prevalence of FLV requiring low vision services in people aged 50 years and older in Madhesh Province was 0.5% (95%CI 0.3-0.7). Out of the estimated 115,943 people aged 50 and older with PVA <6/18, 3.5% (3,987) require low vision services or training. The most common cause of FLV were cataract surgical complications (30.4%), glaucoma (26.1%) and non-trachomatous corneal opacity. The other causes were diabetic retinopathy (8.7%), ARMD (8.7%) and other posterior segment diseases (8.7%) Table 17.

**Table 17: Prevalence of Functional Low Vision**

By Type	Male		Female		Total	
	n	%	n	%	n	%
Crude prevalence	14	0.7	9	0.4	23	0.6
Adjusted prevalence	2,428	0.6	1,559	0.4	3,987	0.5
<b>By Cause</b>						
Cataract surgical complications	4	28.6	3	33.3	7	30.4
Glaucoma	5	35.7	1	11.1	6	26.1
Non-trachomatous corneal opacity	3	21.4	1	11.1	4	17.4
Diabetic retinopathy	2	14.3	0	0.0	2	8.7
ARMD	0	0.0	2	22.2	2	8.7
Other posterior segment disease	0	0.0	2	22.0	2	8.7

### 3.16 Diabetes and Diabetic Retinopathy

Out of total 3,818 survey participants who were examined for RBG, 4.0% (154) were known diabetic and 1.9% (72) were newly diagnosed with diabetes (Table 18). Total prevalence of diabetes was 5.9%.

**Table 18: Prevalence of Diabetes among the Study Participants**

Diabetic Prevalence	Male		Female		Total	
	n	%	n	%	n	%
Known Diabetic	81	4.5	73	3.6	154	4.0
Newly Diagnose Diabetic	31	1.7	41	2.1	72	1.9
No Diabetic	1,700	93.8	1,892	94.3	3,592	94.1
Total RBG taken	1,812	100.0	2,006	100.0	3,818	100.0

Among the people with diabetes, 14.6% had any degree of retinopathy and 4.0% had any grade of maculopathy. In total 15.0% of people with diabetes had any grade of retinopathy and /or maculopathy. (Table 19).

**Table 19: Prevalence of Diabetic Retinopathy**

Retinopathy Grade	No	Among the Diabetic		Full Sample	
		% (95% CI)	% (95 % CI)		
No retinopathy(R0)	182	80.5	(73.8-87.3)	4.5	(3.6-5.4)
Background DR- Mild	23	10.2	(5.3-15.1)	0.6	(0.3-0.8)
Background DR- Observable	9	4.0	(1.5-6.5)	0.2	(0.1-0.4)
Background DR- Referable	1	0.4	(0.0-1.3)	0.0	(0.0-0.0)
Proliferative DR(R4)	0	0.0	(0.0-0.0)	0.0	(0.0-0.0)
Ungradable DR(R6)	0	0.0	(0.0-0.0)	0.0	(0.0-0.0)
<b>Any Retinopathy</b>	<b>33</b>	<b>14.6</b>	<b>(8.7-20.5)</b>	<b>0.8</b>	<b>(0.5-1.1)</b>
<b>Maculopathy grade</b>					
No maculopathy(M0)	199	88.1	(83.0-93.1)	4.9	(4.0-5.8)
Maculopathy-observable M1	9	4.0	(1.2-6.8)	0.2	(0.1-0.4)
Maculopathy-referable M2	0	0.0	(0.0-0.0)	0.0	(0.0-0.0)
Un gradable Maculopathy(M6)	0	0.0	(0.0-0.0)	0.0	(0.0-0.0)
<b>Any Maculopathy</b>	<b>9</b>	<b>4.0</b>	<b>(1.2-6.8)</b>	<b>0.2</b>	<b>(0.1-0.4)</b>
<b>Any retinopathy and/or Maculopathy</b>	<b>34</b>	<b>15.0</b>	<b>(9.0-21.1)</b>	<b>0.8</b>	<b>(0.5-1.2)</b>
Sight threatening DR (R4 and or M2)	0	0.0	(0.0-0.0)	0.0	(0.0-0.0)
Any laser scars	2	0.9	(0.0-2.6)	0.0	(0.0-0.1)

## **CHAPTER-IV**

# **Summary, Conclusion and Recommendation**

### **Conclusion and Recommendation**

Blindness and vision impairment from all causes still remains as a major public health problem among the people aged 50 years and above in Madhesh Province, of Nepal. There remains a significant workload of avoidable blindness and vision impairment to be addressed by the eye health system. The visual outcome of cataract surgery below the WHO standards despite more than ninety percent service coverage suggests further improvement in quality of surgical services. Huge backlog of vision impairing cataract can further be explained by the perceived barriers of lack of felt need , fear of surgery, and cost preventing the uptake of cataract surgical services among the people 50 years and older. Along with cataract as the leading causes of blindness, SVI and MVI, posterior segment diseases, uncorrected refractive error, diabetic retinopathy and functional low vision are major issues to be resolved by the eye care system in this province.

To conclude, this survey provides evidence of public health significance regarding the magnitude of blindness and visual impairment, its causes and performance evaluation of ongoing eye care programs in the province. The information from this survey will help the concerned decision makers to formulate appropriate strategies to combat this needless burden of avoidable blindness and visual impairment.

To recommend, the findings from this survey make sensitization to the concerned authorities to scale up eye care services to those whose eye health needs are not met yet as a goal to achieve Universal Eye Health Coverage.

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ANNEXTURE-I

## RAAB SURVEY TEAM MADHESH PROVINCE

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Ophthalmic Assistant

**Shrawan Kumar Chaudhary**

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**Rabindra Sah**

Eye Health Worker

**Jogindra Prasad Mahato**

Asst. Accountant

**Tuladhar Prasad Singh**

Driver

**Sushil Kumar Yadav**

Driver

### R.M. KEDIA EYE HOSPITAL BIRGANJ

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Ophthalmologist

**Rasdeo Sah**

Ophthalmic Officer

**Sudarshan Prasad Kafle**

Eye Health Worker

### GAUR EYE HOSPITAL GAUR

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**ANNEXTURE-II****Blindness and Visual impairment due to all causes among people aged 50 years and above in Madhesh Province (District Wise)**

Name	Types	Total Population	50+ population	Blindness		<6/60		<6/18		<6/12	
				Persons	Eyes	Persons	Eyes	Persons	Eyes	Persons	Eyes
Madhesh Province	Province	6307016	1261403	16398	146323	50456	257326	191733	587814	373375	943530
Saptari	District	715495	143099	1860	16599	5724	29192	21751	66684	42357	107038
Siraha	District	707934	141587	1841	16424	5663	28884	21521	65979	41910	105907
Dhanusha	District	847800	169560	2204	19669	6782	34590	25773	79015	50190	126831
Mahottari	District	715083	143017	1859	16590	5721	29175	21739	66646	42333	106976
Sarlahi	District	903458	180692	2349	20960	7228	36861	27465	84202	53485	135157
Rautahat	District	854640	170928	2222	19828	6837	34869	25981	79652	50595	127854
Bara	District	839302	167860	2182	19472	6714	34244	25515	78223	49687	125560
Parsa	District	723304	144661	1881	16781	5786	29511	21988	67412	42820	108206

**Blindness and Visual impairment due to cataract among people aged 50 years and above in Madhesh province (District wise)**

Name	Types	Total Population	50+ population	Blindness		<6/60		<6/18		<6/12	
				Persons	Eyes	Persons	Eyes	Persons	Eyes	Persons	Eyes
Madhesh Province	Province	6307016	1261403	10091	99344	32796	169028	107219	353193	170289	491947
Saptari	District	715495	143099	1145	10589	3721	19175	12163	40068	19318	55809
Siraha	District	707934	141587	1133	10477	3681	18973	12035	39644	19114	55219
Dhanusha	District	847800	169560	1356	12547	4409	22721	14413	47477	22891	66128
Mahottari	District	715083	143017	1144	10583	3718	19164	12156	40045	19307	55776
Sarlahi	District	903458	180692	1446	13371	4698	24213	15359	50594	24393	70470
Rautahat	District	854640	170928	1367	12649	4444	22904	14529	47860	23075	66662
Bara	District	839302	167860	1343	12422	4364	22493	14268	47001	22661	65466
Parsa	District	723304	144661	1157	10705	3761	19385	12296	40505	19529	56418

**Distribution of low vision among age 50 years and above people in Madhesh Province (District wise)**

Names	Types	Total Population	50+ Population	Low Vision		Diabetes		DR	
				Persons	Eyes	Persons	Eyes	Persons	Eyes
Madhesh Province	Province	6307016	1261403	6307		74423		11163	
Saptari	District	715495	143099	715		8443		1266	
Siraha	District	707934	141587	708		8354		1253	
Dhanusha	District	847800	169560	848		10004		1501	
Mahottari	District	715083	143017	715		8438		1266	
Sarlahi	District	903458	180692	903		10661		1599	
Rautahat	District	854640	170928	855		10085		1513	
Bara	District	839302	167860	839		9904		1486	
Parsa	District	723304	144661	723		8535		1280	

**Distribution of uncorrected refractive error and presbyopia among age 50 years and above people in Madhesh Province (District wise)**

Names	Types	Total Population	50+ Population	Total refractive error		Uncorrected refractive error		Uncorrected Presbyopia	
				Persons	Eyes	Persons	Eyes	Persons	Eyes
Madhesh Province	Province	6307016	1261403	326703		40185		1057056	
Saptari	District	715495	143099	37063		4559		119917	
Siraha	District	707934	141587	36671		4511		118650	
Dhanusha	District	847800	169560	43916		5402		142091	
Mahottari	District	715083	143017	37041		4556		119848	
Sarlahi	District	903458	180692	46799		5756		151420	
Rautahat	District	854640	170928	44270		5445		143238	
Bara	District	839302	167860	43476		5348		140667	
Parsa	District	723304	144661	37467		4603		121226	

**ANNEXURE-III****Blindness and Visual impairment due to all causes among people aged 50 years and above in Madhesh Province (District and municipality wise)**

Name	Type	Total Population	50+ population	Blindness		<6/60		<6/18		<6/12	
				Persons	Eyes	Persons	Eyes	Persons	Eyes	Persons	Eyes
Madhesh Province	Province	6307016	1261409	16398	146323	50456	257326	191733	587814	373375	943530
Municipality Wise Report											
Saptari	District	715495	143099	1860	16599	5724	29192	21751	66684	42357	107038
Saptakoshi	Municipality	24026	4805	62	557	192	980	730	2239	1422	3594
Kanchanpur	Municipality	58897	11979	155	1390	479	2444	1821	5582	3546	8961
Agnisair-Krishnasabaran	Rural Municipality	30476	6095	79	707	244	1243	926	2840	1804	4539
Rupani	Rural Municipality	29461	5892	77	683	236	1202	896	2746	1744	4407
Sambhunath	Municipality	39267	7853	102	911	314	1602	1194	3660	2325	5874
Khadak	Municipality	50525	10105	131	1172	404	2061	1536	4709	2991	7559
Surunga	Municipality	49508	9902	129	1149	396	2020	1505	4814	2931	7406
Balan-Bihul	Rural Municipality	24427	4885	64	587	195	997	743	2277	1446	3654
Bodebarsain	Municipality	48134	9627	125	1117	385	1964	1463	4486	2850	7201
Dakneshwori	Municipality	47513	9503	124	1102	380	1939	1444	4428	2813	7108
Rajgadh	Rural Municipality	32836	6567	85	762	263	1340	998	3060	1944	4912
Bishnupur	Rural Municipality	25900	5180	67	601	207	1057	787	2414	1533	3875
Rajbiraj	Municipality	78059	15612	203	1811	624	3185	2373	7275	4621	11678
Mahadeva	Rural Municipality	31827	6365	83	738	255	1299	968	2966	1884	4761
Tirahut	Rural Municipality	24858	4972	65	577	199	1014	756	2317	1472	3719
Hanumandhoka Kankalini	Municipality	51138	10228	133	1186	409	2086	1555	4766	3027	7650
Tilathi Kolladi	Rural Municipality	35874	7175	93	832	287	1464	1091	3343	2124	5367
Chhinnamasta	Rural Municipality	31769	6334	83	737	254	1296	966	2961	1881	4753
Siraha	District	707934	141587	1841	16424	5663	28884	21521	63979	41910	105907
Lahan	Municipality	103108	20622	268	2392	825	4207	3134	9610	6104	15425
Dhangadhimai	Municipality	53224	10645	138	1235	426	2172	1618	4960	3151	7962
Golbozar	Municipality	58081	11616	151	1347	465	2370	1766	5413	3438	8689
Mirchaita	Municipality	54588	10918	142	1266	437	2227	1659	5088	3232	8166
Karjanha	Municipality	34398	6980	91	810	279	1424	1061	3252	2066	5221
Kalyanpur	Municipality	54345	10869	141	1261	435	2217	1652	5065	3217	8130
Naraha	Rural Municipality	23409	4282	56	497	171	873	651	1995	1267	3203
Bishnupur	Rural Municipality	20527	4105	53	476	164	838	624	1913	1215	3071
Anama	Rural Municipality	25162	5032	65	584	201	1027	765	2345	1490	3764
Sukhipur	Municipality	41153	8231	107	955	329	1679	1251	3835	2436	6156
Laxmipur Patari	Rural Municipality	31011	6202	81	719	248	1285	943	2890	1836	4639
Salkhuwanankarkatti	Rural Municipality	20659	4132	54	479	165	843	628	1925	1223	3091
Bhagawapur	Rural Municipality	23331	4662	61	541	186	953	709	2173	1380	3487
Nawarajpur	Rural Municipality	21175	4235	55	491	169	864	644	1974	1254	3168
Baryarpatti	Rural Municipality	28009	5602	73	650	224	1143	851	2610	1658	4190
Aurahi	Rural Municipality	25364	5073	66	588	203	1035	771	2364	1502	3794
Siraha	Municipality	91910	18382	239	2132	735	3750	2794	8566	5441	13750
Dhanusha	District	847800	169560	2204	19669	6782	34590	25773	79015	50190	126831
Ganeshman Chamath	Municipality	40514	8123	105	942	325	1657	1235	3785	2404	6076
Dhanusadham	Municipality	50755	10151	132	1178	406	2071	1543	4730	3005	7593
Mithila	Municipality	51554	10311	134	1196	412	2103	1567	4805	3052	7712
Beteshwor	Rural Municipality	24465	4893	64	568	196	998	744	2280	1448	3660
Chhireshworath	Municipality	47378	9476	123	1099	379	1933	1440	4416	2805	7088
Laxminiya	Rural Municipality	31881	6376	83	740	255	1301	969	2971	1887	4769
Mithila Bihari	Municipality	37712	7542	98	875	302	1539	1146	3515	2233	5642
Hansapur	Municipality	42487	8497	110	986	340	1733	1292	3960	2515	6356
Sabala	Municipality	58167	11633	151	1349	465	2373	1768	5421	3443	8702
Sahidnagar	Municipality	52914	10583	138	1228	423	2159	1609	4932	3133	7916
Kamais	Municipality	43026	8005	112	998	344	1755	1308	4010	2547	6437
Janak Nandini	Rural Municipality	28326	5665	74	657	227	1156	861	2640	1677	4238
Bideha	Municipality	36288	7257	94	842	290	1480	1103	3382	2148	5428
Aurahi	Rural Municipality	25372	5074	66	589	203	1035	771	2365	1502	3796
Janakpur	Sub Metropolitan City	184354	36871	479	4277	1475	7522	5604	17182	10914	27579
Dhanauji	Rural Municipality	23991	4798	62	557	192	979	729	2236	1420	3589
Nagarain	Municipality	40018	8004	104	928	320	1633	1217	3730	2369	5987
Mulhiyapatti Musaharmi	Rural Municipality	28500	5700	74	661	228	1163	866	2656	1687	4264
Mahottari	District	715083	143017	1859	16590	5721	29175	21739	66646	42333	106976
Bardibas	Municipality	75492	15098	196	1751	604	3080	2295	7036	4469	11294
Gausala	Municipality	76268	15254	198	1789	610	3112	2319	7108	4515	11410
Sonama	Rural Municipality	49906	8781	114	1019	351	1791	1335	4092	2599	6568
Aurahi	Municipality	35798	7160	93	831	285	1461	1088	3336	2119	5935
Bhanganaha	Municipality	52949	10590	138	1228	424	2160	1610	4935	3135	7921
Loharpatti	Municipality	45217	9043	118	1049	362	1845	1375	4214	2677	6764
Balawa	Municipality	47863	9573	124	1110	383	1953	1455	4461	2833	7160
Ram Gopalpur	Municipality	33962	6792	88	788	272	1386	1032	3165	2011	5081
Samsi	Rural Municipality	38023	7605	99	882	304	1551	1156	3544	2251	5688
Manara Shisawa	Municipality	56668	11334	147	1315	453	2312	1723	5281	3355	8478
Ekara	Rural Municipality	33025	6605	86	766	264	1347	1004	3078	1955	4541
Mahottari	Rural Municipality	31344	6269	81	727	251	1279	953	2971	1856	4689
Pipara	Rural Municipality	40949	8190	106	950	328	1671	1245	3816	2424	6126
Matihani	Municipality	35073	7015	91	814	281	1431	1066	3269	2076	5247
Jaleshwor	Municipality	68545	13709	178	1590	548	2797	2084	6388	4058	10254

Name	Type	Total Population	50+ population	Blindness		<6/60		<6/18		<6/12	
				Persons	Eyes	Persons	Eyes	Persons	Eyes	Persons	Eyes
Sarlahi	District	503456	180692	2349	20960	7226	56861	27465	84202	53485	135157
Lalbandi	Municipality	71064	14213	185	1649	559	2899	2160	6623	4207	10631
Hanwan	Municipality	52312	10462	136	1214	418	2134	1590	4875	3097	7826
Bagmati	Municipality	48116	9623	125	1115	385	1963	1463	4484	2848	7198
Brahmabhattawa	Municipality	82203	16441	214	1907	658	3354	2499	7661	4866	12298
Haripur	Municipality	43856	8771	114	1017	351	1789	1333	4087	2595	6561
Ishworpur	Municipality	70506	14101	183	1636	564	2877	2143	6571	4174	10548
Haripurwa	Municipality	42018	8404	109	975	336	1714	1277	3916	2487	6286
Parse	Rural Municipality	25194	5039	66	565	202	1028	766	2348	1491	3769
Brahmapuri	Rural Municipality	34625	6925	90	803	277	1413	1053	3227	2050	5180
Chandranagar	Rural Municipality	38916	7783	101	903	311	1588	1183	3627	2304	5822
Kabilas	Municipality	49320	9864	128	1144	395	2012	1499	4597	2920	7378
Chakraghatta	Rural Municipality	32546	6509	85	755	260	1328	989	3033	1927	4869
Basbariya	Rural Municipality	27575	5515	72	640	221	1125	838	2570	1632	4125
Dhankaul	Rural Municipality	28864	5773	75	670	231	1178	877	2690	1709	4318
Ramnagar	Rural Municipality	33698	6740	88	782	270	1375	1024	3141	1995	5041
Balara	Municipality	53340	10668	139	1237	427	2176	1622	4971	3158	7980
Godaika	Municipality	55603	11133	145	1291	445	2271	1692	5188	3295	8327
Bishnu	Rural Municipality	28901	5780	75	671	231	1179	879	2694	1711	4324
Kaudena	Rural Municipality	30436	6087	79	705	243	1242	925	2837	1802	4553
Malangawa	Municipality	54305	10861	141	1260	434	2216	1651	5061	3215	8124
Rautahat	District	854640	170928	2222	19828	6837	34869	25981	79652	50395	127854
Chandrapur	Municipality	92832	18566	241	2154	743	3788	2822	8652	5496	13888
Gujara	Municipality	58357	11671	152	1354	467	2381	1774	5439	3455	8730
Fatuka Bijayapur	Municipality	45276	9055	118	1050	362	1847	1376	4220	2680	6773
Ketehariya	Municipality	47451	9490	123	1101	380	1936	1443	4422	2809	7099
Brindaban	Municipality	53037	10807	138	1230	424	2164	1612	4943	3140	7934
Gadhimalai	Municipality	50349	10070	131	1168	403	2054	1531	4693	2981	7532
Madhav Nereyan	Municipality	43575	8715	113	1011	349	1778	1325	4061	2580	6519
Garuda	Municipality	62297	12459	162	1445	498	2542	1894	5806	3688	9320
Dewahi Gonali	Municipality	38609	7922	103	919	317	1816	1204	3692	2345	5926
Maulapur	Municipality	32594	6519	85	756	261	1330	991	3038	1930	4876
Beuchimai	Municipality	41056	8211	107	952	328	1675	1248	3826	2431	6142
Paroha	Municipality	46266	9253	120	1073	370	1888	1406	4312	2739	6921
Rajpur	Municipality	49915	9983	130	1158	399	2037	1517	4652	2955	7467
Yemunamai	Rural Municipality	29439	5888	77	683	236	1201	895	2744	1743	4404
Durga Bhagawati	Rural Municipality	28522	5704	74	662	228	1164	867	2658	1889	4267
Rajdevi	Municipality	38219	7644	99	887	306	1559	1162	3562	2263	5718
Gaur	Municipality	44528	8906	116	1033	356	1817	1354	4150	2636	6661
Ishanath	Municipality	51318	10264	133	1191	411	2094	1560	4783	3038	7677
Bera	District	889302	167860	2182	19472	6714	34244	25515	78223	49667	125560
Nigadhi	Municipality	44444	8889	116	1031	356	1813	1351	4142	2631	6649
Kohiawi	Municipality	54663	10933	142	1268	437	2230	1662	5095	3235	8178
Jitpur Simara	Sub Metropolitan City	146639	29328	381	3402	1173	5983	4458	13667	8681	21937
Parwanpur	Rural Municipality	27628	5526	72	641	221	1127	840	2575	1636	4133
Prasundi	Rural Municipality	30310	6062	79	703	242	1237	921	2825	1794	4534
Bishampur	Rural Municipality	28773	5755	75	668	230	1174	875	2682	1703	4304
Phetra	Rural Municipality	30856	6171	80	716	247	1259	938	2876	1827	4616
Kalalya	Sub Metropolitan City	149795	29959	389	3475	1198	6112	4554	13961	8868	22409
Karaiyemai	Rural Municipality	32468	6494	84	753	260	1325	987	3026	1922	4857
Beragadhi	Rural Municipality	33265	6653	86	772	266	1357	1011	3100	1969	4976
Adarsha Kotwal	Rural Municipality	33192	6638	86	770	266	1354	1009	3093	1965	4966
Simrongadh	Municipality	58730	11746	153	1363	470	2396	1785	5474	3477	8786
Pacharute	Municipality	41159	8232	107	955	329	1679	1251	3836	2437	6157
Mahagadhimalai	Municipality	63592	12718	165	1475	509	2595	1933	5927	3765	9513
Dental	Rural Municipality	28193	5639	73	654	226	1150	857	2628	1668	4218
Suberne	Rural Municipality	35595	7119	93	826	285	1452	1082	3317	2107	5325
Parse	District	723304	144661	1881	16781	5786	29511	21988	67412	42820	108206
Thori	Rural Municipality	25577	5115	67	593	205	1044	778	2384	1514	3826
Jirabhawani	Rural Municipality	27531	5506	72	629	220	1123	837	2566	1630	4119
Jagernathpur	Rural Municipality	38999	7800	101	905	312	1591	1186	3635	2309	5834
Paterwa Sugauli	Rural Municipality	28794	5759	75	668	230	1175	875	2584	1705	4308
Sakhuwa Prasundi	Rural Municipality	39507	7901	103	917	316	1812	1201	3682	2339	5910
Parsagadhi	Municipality	46616	9323	121	1081	373	1902	1417	4345	2760	6974
Birgunj	Metropolitan City	291415	58283	758	6761	2331	11890	8859	27160	17252	43596
Bahudamal	Municipality	47293	9459	123	1097	378	1930	1438	4408	2800	7075
Pokharia	Municipality	42313	8463	110	982	339	1726	1286	3944	2505	6330
Kalikamai	Rural Municipality	25326	5065	66	588	203	1033	770	2360	1499	3789
Dhobini	Rural Municipality	23873	4775	62	554	191	974	726	2225	1433	3571
Chhipaharmal	Rural Municipality	31897	6379	83	740	255	1301	970	2973	1888	4772
Pakaha Mainapur	Rural Municipality	24906	4981	65	578	199	1016	757	2321	1474	3726
Bindabasini	Rural Municipality	29257	5851	76	679	234	1194	889	2727	1732	4377

**ANNEXURE-IV****Blindness and Visual impairment due to cataract among people aged 50 years and above in Madhesh province (District and Municipality wise)**

Name	Types	Total Population	Blindness		<5/60		<6/18		<6/12	
			50+ population	Persons	Eyes	Persons	Eyes	Persons	Eyes	Persons
<b>Madhesh Province</b>										
		6307016	1261403	10091	93344	32796	169028	107219	353193	170289
<b>Municipality Wise Report</b>										
Saptari	District	715495	143099	1145	10589	3721	19175	12163	40068	19318
Septakoshi	Municipality	24026	4805	38	356	125	644	408	1345	649
Kanchanpur	Municipality	59897	11379	96	886	311	1605	1018	3354	1617
Agnisair Krishnasabara	Rural Municipality	30476	6095	49	451	158	817	518	1707	823
Rupani	Rural Municipality	29461	5892	47	436	153	790	501	1650	795
Sambhunath	Municipality	39257	7853	63	581	204	1052	668	2199	1060
Khadak	Municipality	50525	10105	81	748	263	1354	859	2829	1364
Surunga	Municipality	49508	9902	79	733	257	1327	842	2772	1337
Balan-Bihul	Rural Municipality	24427	4885	39	362	127	655	415	1368	650
Bodebansai	Municipality	48134	9627	77	712	250	1290	918	2696	1300
Dalneshwori	Municipality	47513	9503	76	703	247	1273	808	2661	1283
Rajgadh	Rural Municipality	32836	6567	53	486	171	880	558	1839	887
Bishnupur	Rural Municipality	25900	5180	41	383	135	694	440	1450	699
Rajbiraj	Municipality	78059	15612	125	1155	406	2092	1327	4371	2108
Mahadeva	Rural Municipality	31827	6365	51	471	166	853	541	1782	859
Tirahut	Rural Municipality	24858	4972	40	368	129	666	423	1392	671
Hanumandhoka Kankal	Municipality	51138	10228	82	757	266	1370	869	2864	1381
Tilash Kolladi	Rural Municipality	35874	7175	57	531	187	961	610	2009	969
Chhinnamasta	Rural Municipality	31769	6354	51	470	165	851	540	1779	858
Siraha	District	707934	141587	1133	10477	3661	18973	12035	39644	19114
Lahan	Municipality	103108	20522	165	1526	536	2763	1753	5774	2784
Dhangadhimai	Municipality	53224	10645	85	788	277	1426	905	2981	1437
Golbazar	Municipality	58081	11615	93	860	302	1557	987	3253	1568
Mirchalya	Municipality	54588	10918	87	808	284	1463	928	3057	1474
Karjanha	Municipality	34898	6980	56	516	181	935	593	1954	942
Kalyanpur	Municipality	54345	10869	87	804	283	1456	924	3043	1457
Naraha	Rural Municipality	21409	4282	34	317	113	574	364	1199	578
Bishnupur	Rural Municipality	20527	4105	33	304	107	550	349	1150	554
Aranya	Rural Municipality	25162	5032	40	372	131	674	428	1409	679
Sukhipur	Municipality	41133	8231	66	609	214	1103	700	2305	1111
Laxmipur Patari	Rural Municipality	31011	6202	50	459	161	831	527	1737	837
Sakhawanankarkatti	Rural Municipality	20659	4132	33	306	107	554	351	1157	558
Bhagawanpur	Rural Municipality	23311	4562	37	345	121	625	396	1305	629
Nawarajpur	Rural Municipality	21175	4235	34	313	110	567	360	1186	572
Beriypattai	Rural Municipality	28009	5602	45	415	146	751	476	1569	756
Aurahi	Rural Municipality	25364	5073	41	375	132	680	431	1420	685
Siraha	Municipality	91910	18382	147	1360	478	2453	1562	5147	2482
Dhanusha	District	847800	169560	1356	12547	4409	22721	14413	47477	22891
Ganeshman Charnath	Municipality	40614	8123	65	601	211	1088	690	2274	1097
Dhanusadham	Municipality	50755	10151	81	751	264	1360	863	2842	1370
Mithila	Municipality	51554	10311	82	763	268	1382	876	2887	1392
Bateshwor	Rural Municipality	24465	4893	39	362	127	656	416	1370	661
Chhireshwornath	Municipality	47378	9476	76	701	246	1270	805	2653	1279
Laxminiya	Rural Municipality	31883	6376	51	472	166	854	542	1785	861
Mithila Bihari	Municipality	37712	7542	60	558	196	1011	641	2112	1018
Hansapur	Municipality	42487	8497	68	629	221	1139	722	2379	1147
Sabilla	Municipality	58167	11633	93	861	302	1559	989	3257	1571
Sahidnagar	Municipality	52914	10583	85	783	275	1418	900	2963	1429
Kamala	Municipality	43026	8605	69	637	224	1153	731	2409	1162
Janak Nandini	Rural Municipality	28326	5665	45	419	147	759	482	1586	765
Bideha	Municipality	36286	7257	58	537	189	972	617	2032	980
Aurahi	Rural Municipality	25372	5074	41	376	132	680	431	1421	685
Janakpur	Sub Metropolitan City	184354	36871	295	2728	959	4941	3134	10324	4378
Dhanauji	Rural Municipality	23991	4798	38	355	125	643	408	1343	648
Nagarkot	Municipality	40018	8004	64	592	208	1072	680	2241	1080
Mukhiyepatti Musahar	Rural Municipality	28500	5700	46	422	148	764	485	1596	770
Mahottari	District	715083	143017	1144	10583	3718	19164	12156	40445	19307
Bardibas	Municipality	75492	15098	121	1117	393	2023	1283	4228	2038
Gausala	Municipality	76268	15254	122	1129	397	2044	1297	4271	2059
Sonama	Rural Municipality	43906	8781	70	650	228	1177	746	2459	1185
Aurahi	Municipality	35798	7160	57	530	186	959	609	2005	967
Bhangdeha	Municipality	52949	10590	85	784	275	1419	900	2965	1430
Iharpatti	Municipality	45217	9043	72	669	235	1212	769	2532	1221
Balswa	Municipality	47863	9573	77	708	249	1283	814	2680	1292
Ram Gopalpur	Municipality	33962	6792	54	503	177	910	577	1902	917
Samsi	Rural Municipality	38023	7605	61	563	198	1019	646	2129	1027
Manare Shisawa	Municipality	56668	11334	91	839	295	1519	963	3173	1530
Ekdara	Rural Municipality	33025	6605	53	489	172	885	561	1849	892
Mahottari	Rural Municipality	31244	6269	50	464	163	840	533	1755	846
Pijoara	Rural Municipality	40949	8190	66	605	213	1097	696	2293	1105
Matihani	Municipality	35073	7015	56	519	182	940	596	1964	947
Jaleshwor	Municipality	68546	13709	110	1014	356	1837	1165	3839	1851

Name	Types	Total Population	50+ population	Blindness		<6/60		<6/18		<6/12	
				Persons	Eyes	Persons	Eyes	Persons	Eyes	Persons	Eyes
Sarlahi	District	903458	180632	1446	13371	4698	24213	15359	50594	24393	70470
Lalbandi	Municipality	71064	14213	114	1052	370	1905	1208	3980	1919	5543
Hariwan	Municipality	52312	10462	84	774	272	1402	889	2929	1412	4080
Bagmati	Municipality	48116	9623	77	712	250	1290	818	2684	1299	3753
Barahathawa	Municipality	82203	16441	132	1217	427	2203	1397	4603	2219	6412
Haripur	Municipality	43856	8771	70	649	228	1175	746	2456	1184	3421
Ishworpur	Municipality	70506	14101	113	1043	367	1890	1199	3948	1904	5499
Hanpurwa	Municipality	42018	8404	67	622	218	1126	714	2353	1134	3277
Parva	Rural Municipality	25184	5039	40	373	131	675	428	1411	680	1965
Bramhapuri	Rural Municipality	34625	6925	55	512	180	928	589	1939	935	2701
Chandranagar	Rural Municipality	39916	7793	62	576	202	1043	662	2179	1051	3035
Kabilasi	Municipality	49320	9854	79	730	256	1322	838	2762	1332	3847
Chekraghetta	Rural Municipality	32546	6509	52	482	169	872	553	1823	879	2539
Basbariya	Rural Municipality	27575	5515	44	408	143	739	469	1544	745	2151
Dhankeul	Rural Municipality	28864	5773	46	427	190	774	491	1616	779	2251
Ramnagar	Rural Municipality	33698	6740	54	499	175	903	573	1887	910	2628
Balara	Municipality	53240	10658	85	789	277	1430	907	2987	1440	4161
Godaita	Municipality	55663	11133	89	824	289	1492	946	3117	1503	4342
Bishnu	Rural Municipality	28901	5780	45	428	150	775	491	1618	780	2254
Kaudena	Rural Municipality	30436	6087	49	450	158	816	517	1704	822	2374
Msangawa	Municipality	54305	10861	87	804	282	1455	923	3041	1466	4236
Rautahat	District	854640	170928	1367	12649	4444	22904	14529	47880	23075	66662
Chandrapur	Municipality	92832	18566	149	1374	483	2488	1578	5199	2506	7241
Gujera	Municipality	58357	11671	93	864	303	1564	992	3268	1576	4552
Fatuwa Bijayapur	Municipality	45276	9055	72	670	235	1213	770	2535	1222	3532
Kataharyya	Municipality	47451	9490	76	702	247	1272	807	2657	1281	3701
Brindaban	Municipality	53037	10607	85	785	276	1421	902	2970	1432	4137
Gadhimal	Municipality	50349	10070	81	745	262	1349	856	2820	1359	3927
Madhav Narayan	Municipality	43575	8715	70	645	227	1168	741	2440	1177	3399
Garuda	Municipality	62297	12459	100	922	324	1670	1059	3489	1682	4859
Dewahi Gonahi	Municipality	39609	7922	63	586	205	1062	673	2218	1069	3090
Maulapur	Municipality	32594	6519	52	482	169	874	554	1825	880	2542
Baudhimali	Municipality	41056	8211	66	608	213	1100	698	2299	1109	3202
Parota	Municipality	46266	9253	74	685	241	1240	787	2591	1249	3609
Rajpur	Municipality	49915	9983	80	739	260	1338	849	2795	1348	3899
Yamuthaimai	Rural Municipality	29439	5888	47	436	153	789	500	1649	795	2296
Durga Bhagawati	Rural Municipality	28522	5704	46	422	148	764	485	1597	770	2225
Rajdevi	Municipality	38219	7644	61	566	199	1024	650	2140	1032	2981
Gaur	Municipality	44528	8906	71	659	232	1193	757	2494	1202	3473
Ishanath	Municipality	51318	10264	82	760	267	1375	872	2874	1386	4003
Bera	District	839302	167560	1343	12422	4364	22493	14268	47001	22661	65466
Nijgadh	Municipality	44444	8889	71	658	231	1151	756	2489	1200	3467
Kothiwal	Municipality	54663	10933	87	809	284	1465	929	3061	1476	4264
Jitpur Simara	Sub Metropolitan City	145639	29328	235	2170	763	3930	2493	8212	3959	11438
Parwanipur	Rural Municipality	27628	5525	44	409	144	740	470	1547	746	2155
Prasarni	Rural Municipality	30310	6062	48	449	158	812	515	1697	818	2364
Bishrampur	Rural Municipality	28773	5755	46	426	150	771	489	1611	777	2244
Pheta	Rural Municipality	30856	6171	49	457	160	827	525	1728	833	2407
Kalalya	Sub Metropolitan City	149795	29959	240	2217	779	4015	2547	8389	4044	11684
Karalyamal	Rural Municipality	32468	5494	52	481	169	870	552	1818	877	2533
Baragadhi	Rural Municipality	33205	6653	53	492	173	892	566	1863	898	2595
Adarsa Kotwal	Rural Municipality	33192	6638	53	491	173	890	564	1859	896	2589
Simreungadh	Municipality	58730	11746	94	869	305	1574	998	3289	1586	4581
Pecherauta	Municipality	41159	8232	66	609	214	1103	700	2305	1111	3210
Mahagedhimal	Municipality	63592	12718	102	941	331	1704	1081	3561	1717	4960
Devta	Rural Municipality	28193	5639	45	417	147	756	479	1579	761	2199
Subarna	Rural Municipality	35595	7119	57	527	185	954	605	1993	961	2776
Parva	District	723304	144661	1157	10705	3761	19385	12296	40505	19529	56418
Thori	Rural Municipality	25577	5115	41	379	133	685	435	1432	691	1995
Jirabhwani	Rural Municipality	27531	5505	44	407	143	738	468	1542	743	2147
Jagarnethpur	Rural Municipality	38999	7800	62	577	203	1045	663	2184	1053	3042
Paterwa Sugaulli	Rural Municipality	28784	5759	46	426	150	772	489	1612	777	2246
Saldhuwa Prasarni	Rural Municipality	39507	7901	63	585	205	1059	672	2212	1067	3082
Parsagadhi	Municipality	46616	9323	75	690	242	1249	792	2610	1259	3636
Birgunj	Metropolitan City	291415	58283	466	4313	1515	7810	4954	16319	7868	22730
Bahudarmal	Municipality	47293	9459	75	700	245	1267	804	2648	1277	3689
Poldharya	Municipality	42313	8463	68	626	220	1134	719	2370	1142	3300
Kalikamai	Rural Municipality	25328	5065	41	375	132	679	431	1418	684	1975
Dhobini	Rural Municipality	23873	4775	38	353	124	640	406	1337	645	1862
Chhipaharmal	Rural Municipality	31897	6379	51	472	166	855	542	1786	861	2488
Pakaha Maiharpur	Rural Municipality	24906	4981	40	369	130	657	423	1395	672	1943
Bindesaini	Rural Municipality	29257	5851	47	433	152	784	497	1638	790	2282

**ANNEXURE-V**

**Distribution of low vision among age 50 years and above people  
in Madhesh Province (District wise)**

Name	Type	Total Population	50+ Population	Low Vision	Diabetes	DR
Madhesh Province	Province	6307016	1261403	6307	74423	11163
Municipality Wise Report:						
Saptari	District	715495	143099	715	8443	1266
Sajekvali	Municipality	24026	4805	24	284	43
Kanchanpur	Municipality	59897	11979	60	707	106
Agnisir Krishnasabaran	Rural Municipality	30476	6095	30	360	54
Rupani	Rural Municipality	29461	5892	29	348	52
Sambhunath	Municipality	39267	7853	39	463	70
Khadak	Municipality	50525	10105	51	596	89
Surunga	Municipality	49508	9902	50	584	88
Balan-Bihul	Rural Municipality	24427	4885	24	286	43
Bodebarain	Municipality	48134	9627	48	568	85
Deukheshwor	Municipality	47513	9503	48	561	84
Rajgadh	Rural Municipality	32836	6567	33	387	58
Bishnupur	Rural Municipality	25900	5180	26	306	46
Rajbiraj	Municipality	78059	15612	78	921	138
Mahadeva	Rural Municipality	31827	6385	32	376	56
Tirahut	Rural Municipality	24858	4972	25	293	44
Hanumennagar Kankalini	Municipality	51138	10228	51	603	91
Tilathi Koliadi	Rural Municipality	35874	7175	36	423	63
Chhinnamasta	Rural Municipality	31769	6354	32	375	56
Siroha	District	707934	141587	708	8354	1253
Lahan	Municipality	103108	20622	103	1217	183
Dhangadhimai	Municipality	53224	10645	53	628	94
Golbazar	Municipality	58081	11616	58	685	103
Mirchaita	Municipality	54588	10918	55	644	97
Karjanha	Municipality	34899	6980	35	412	62
Kalyanpur	Municipality	54345	10869	54	641	96
Nereha	Rural Municipality	21409	4282	21	253	38
Bishnupur	Rural Municipality	20527	4105	21	242	36
Arnaea	Rural Municipality	25162	5032	25	297	45
Sukhipur	Municipality	41153	8233	41	486	73
Laxmiapur Patari	Rural Municipality	31011	6202	31	366	55
Sakhwananarkot	Rural Municipality	20659	4132	21	244	37
Bhegawenpur	Rural Municipality	23311	4662	23	275	41
Navarajpur	Rural Municipality	21175	4235	21	250	37
Barlyarpatti	Rural Municipality	28009	5602	28	331	50
Aurahi	Rural Municipality	25364	5073	25	299	45
Siraha	Municipality	91910	18382	92	1085	163
Dhanusha	District	847800	169560	848	10004	1301
Geneshman Charnath	Municipality	40614	8123	41	479	72
Dhanusodhain	Municipality	50755	10151	51	599	90
Mithila	Municipality	51554	10311	52	606	93
Bateshwor	Rural Municipality	24465	4893	24	289	43
Chhireshwornath	Municipality	47378	9476	47	559	84
Laxminiya	Rural Municipality	31881	6376	32	376	56
Mithila Biban	Municipality	37712	7542	38	445	67
Hansapur	Municipality	42487	8497	42	501	75
Sabaila	Municipality	58167	11633	58	686	103
Sahidnagar	Municipality	52914	10583	53	624	94
Kamala	Municipality	43026	8605	43	508	76
Jenak Nandini	Rural Municipality	28326	5665	28	334	50
Bideha	Municipality	35786	7257	36	428	64
Aurahi	Rural Municipality	25372	5074	25	299	45
Jenakpur	Sub Metropolitan City	184954	36871	184	2175	326
Dhanauj	Rural Municipality	23991	4798	24	283	42
Nagarkot	Municipality	40018	8004	40	472	71
Mukhiyapatti Musaharmiya	Rural Municipality	28500	5700	29	336	50
Mahottari	District	715083	143017	715	8438	1266
Bardibas	Municipality	75492	15098	75	891	134
Gausala	Municipality	76268	15254	76	900	135
Sonama	Rural Municipality	43906	8791	44	518	78
Aurahi	Municipality	35798	7160	36	422	63
Bhanggaha	Municipality	52949	10590	53	625	94
Loharpatti	Municipality	45217	9043	45	534	80
Belaika	Municipality	47863	9579	48	565	85
Ram Gopalpur	Municipality	33962	6792	34	403	60
Samsi	Rural Municipality	38023	7605	38	449	67
Manara Shisawa	Municipality	56668	11334	57	669	100
Ekeda	Rural Municipality	33025	6605	33	390	58
Mahottari	Rural Municipality	31344	6269	31	370	55
Pipara	Rural Municipality	40949	8190	41	483	72
Mathani	Municipality	35073	7015	35	414	62
Jaleshwor	Municipality	68546	13709	65	809	121

Name	Type	Total Population	50+ Population	Low Vision	Diabetes	DR
Sarlahi	District	903458	180632	903	10661	1599
Lalbendi	Municipality	71064	14213	71	839	126
Hamwan	Municipality	52312	10482	52	617	93
Bagmati	Municipality	48116	9623	48	568	85
Burahathawa	Municipality	82203	16441	82	970	145
Haripur	Municipality	43856	8771	44	518	78
Isworpur	Municipality	70506	14101	71	832	125
Harpur	Municipality	42018	8404	42	496	74
Parsa	Rural Municipality	25194	5039	25	297	45
Brahmapuri	Rural Municipality	34625	6925	35	409	61
Chandranagar	Rural Municipality	38916	7783	39	459	69
Kabllasi	Municipality	49320	9864	49	582	87
Chakraghatta	Rural Municipality	32546	6509	33	384	58
Basbariya	Rural Municipality	27575	5515	28	325	49
Dhenkaul	Rural Municipality	28864	5773	29	341	51
Ramnagar	Rural Municipality	33698	6740	34	398	60
Balara	Municipality	53340	10668	53	629	94
Godeita	Municipality	55668	11139	56	657	99
Bishnu	Rural Municipality	28901	5780	29	341	51
Kaudena	Rural Municipality	30436	6087	30	359	54
Malangawa	Municipality	54305	10861	54	641	96
Rautahat	District	854640	170928	835	10085	1513
Chandrapur	Municipality	92832	18566	93	1095	164
Gujare	Municipality	58357	11671	58	689	103
Fatuwa Bijayapur	Municipality	45278	9055	45	534	80
Karahantha	Municipality	47451	9490	47	560	84
Brindaban	Municipality	53037	10607	53	626	94
Gadhimal	Municipality	50349	10070	50	594	89
Madhav Narayan	Municipality	43575	8715	44	514	77
Garuda	Municipality	62297	12459	62	735	110
Dewahi Gonahi	Municipality	39609	7922	40	457	70
Maulapur	Municipality	32594	6519	33	385	58
Baudhimal	Municipality	41056	8211	41	484	73
Paroha	Municipality	46266	9253	46	546	82
Rajpur	Municipality	49915	9983	50	589	86
Yamunansi	Rural Municipality	29439	5888	29	347	52
Durga Bhagawati	Rural Municipality	28522	5704	29	337	50
Rajdevi	Municipality	38219	7644	38	451	68
Gaur	Municipality	44528	8906	45	525	79
Ishanath	Municipality	51318	10284	51	606	91
Bara	District	839302	187880	839	9904	1486
Nijgadh	Municipality	44444	8889	44	524	79
Kohiwi	Municipality	54663	10933	55	645	97
Jitpur Simra	Sub Metropolitan City	146639	29328	147	1730	250
Parkanipur	Rural Municipality	27628	5526	28	326	49
Prasauni	Rural Municipality	30310	6062	30	358	54
Bahirampur	Rural Municipality	28773	5755	29	340	51
Pheta	Rural Municipality	30856	6171	31	364	55
Kelaiye	Sub Metropolitan City	149795	29959	150	1768	265
Karaiyamai	Rural Municipality	32468	6494	32	383	57
Baragadhi	Rural Municipality	33265	6653	33	393	59
Adarsa Kotwal	Rural Municipality	33192	6638	33	392	59
Simroongadh	Municipality	58730	11746	59	693	104
Pacharauta	Municipality	41159	8232	41	486	73
Mahagadhimal	Municipality	63595	12718	64	750	113
Dental	Rural Municipality	28193	5639	28	333	50
Suberna	Rural Municipality	35595	7119	36	420	63
Parsa	District	723304	144661	723	8535	1280
Thori	Rural Municipality	25577	5115	26	302	45
Jirabhawan	Rural Municipality	27531	5506	28	325	49
Jagannathpur	Rural Municipality	38999	7800	39	460	69
Paterwa Sugauli	Rural Municipality	28794	5759	29	340	51
Sekhuwa Prasauni	Rural Municipality	39507	7901	40	466	70
Parsagadhi	Municipality	46616	9323	47	550	83
Birgunj	Metropolitan City	291415	58283	291	3439	516
Bahudarmal	Municipality	47293	9459	47	558	84
Pokhriya	Municipality	42313	8463	42	499	75
Kallikamai	Rural Municipality	25326	5065	25	299	45
Dhobini	Rural Municipality	23873	4775	24	282	42
Chhipaharmal	Rural Municipality	31897	6379	32	376	56
Pakaha Mainepur	Rural Municipality	24906	4981	25	294	44
Bindabasini	Rural Municipality	29257	5851	29	345	52

**ANNEXURE-VI****Distribution of uncorrected refractive error and presbyopia among age 50 years and above people in Madhesh Province (District wise)**

Name	Types	Total Population	50+ Population	Total refractive error	Uncorrected refractive error	Uncorrected Presbyopia
Madhesh Province	Province	6307016	1261403	326703	40185	1057056
Municipality Wise Report						
Saptari	District	718495	143099	37063	4559	119917
Sajalakoshi	Municipality	24026	4805	1245	153	4027
Kenchenuwa	Municipality	58897	11979	3103	382	10039
Agnisair Krishnasabaran	Rural Municipality	30478	6095	1579	194	5108
Rupani	Rural Municipality	29461	5892	1526	188	4938
Sambhuwanth	Municipality	39267	7853	2034	250	6581
Khadak	Municipality	50825	10105	2617	322	8468
Surunga	Municipality	49508	9902	2565	315	8298
Belen-Bihul	Rural Municipality	24427	4885	1265	156	4094
Boolebarsain	Municipality	48134	9627	2493	307	8067
Dwanechwar	Municipality	47513	9603	2461	303	7963
Rajgadh	Rural Municipality	32835	6567	1701	209	5503
Bishnupur	Rural Municipality	25900	5180	1342	165	4341
Rajbiraj	Municipality	78059	15612	4043	497	13083
Mahadeva	Rural Municipality	31827	6365	1649	203	5334
Tirahut	Rural Municipality	24838	4972	1288	158	4166
Hanumanagar Kanklini	Municipality	51138	10228	2649	326	8571
Thaliti Koledi	Rural Municipality	95874	7175	1858	229	6012
Chinnamasta	Rural Municipality	31789	6354	1646	202	5324
Sikra	District	707934	141587	36673	4513	118650
Lahan	Municipality	109108	20622	5341	657	17281
Dhangadhimai	Municipality	53224	10645	2757	339	8920
Golbazar	Municipality	58081	11616	3009	370	9734
Minchaitya	Municipality	54588	10918	2828	348	9149
Kanjanne	Municipality	34898	6980	1808	222	5849
Kalyanpur	Municipality	54345	10869	2815	346	9108
Nerhati	Rural Municipality	21409	4282	1109	136	3588
Bishnupur	Rural Municipality	20527	4105	1063	131	3440
Arjama	Rural Municipality	25162	5032	1303	160	4217
Sukhipur	Municipality	41153	8231	2132	262	6897
Laxmiapur Patar	Rural Municipality	31011	6202	1606	198	5197
Sakhwanenkarkeitti	Rural Municipality	20659	4132	1070	132	3462
Bhagewantpur	Rural Municipality	23311	4562	1208	149	3907
Navarajpur	Rural Municipality	21175	4235	1097	135	3549
Balryarpatti	Rural Municipality	28009	5602	1451	178	4694
Aurahi	Rural Municipality	25364	5073	1314	162	4251
Sraha	Municipality	91910	18382	4761	586	15404
Dhanusha	District	847800	169560	43918	5402	142091
Geneshman Chamech	Municipality	40514	8123	2104	259	6807
Dhanusadham	Municipality	50755	10151	2629	323	8507
Mithila	Municipality	51554	10311	2670	328	8540
Bateshwor	Rural Municipality	24465	4893	1287	156	4100
Chhireshworath	Municipality	47378	9476	2454	302	7941
Lumminiya	Rural Municipality	31881	6376	1651	203	5343
Mithila Bihari	Municipality	37712	7542	1953	240	6321
Hansapur	Municipality	42487	8497	2201	271	7121
Salauli	Municipality	58157	11633	3013	373	9749
Sehingbar	Municipality	52914	10583	2741	337	8868
Kamala	Municipality	43026	8605	2229	274	7211
Janki Nandini	Rural Municipality	28326	5665	1467	180	4747
Bideha	Municipality	36286	7257	1880	231	6082
Aurahi	Rural Municipality	26372	5074	1314	162	4252
Jankapur	Sub Metropolitan City	184354	36871	9550	1175	30898
Dheneju	Rural Municipality	23991	4798	1243	153	4021
Nagarain	Municipality	40018	8004	2073	255	6707
Mukhnyepatti Musaharmiy	Rural Municipality	28500	5700	1476	182	4777
Mithotar	District	715083	143017	37043	4556	119848
Bardibas	Municipality	75492	15098	3910	481	12652
Gausela	Municipality	76268	15254	3951	486	12783
Soneme	Rural Municipality	43908	8781	2274	280	7359
Aurahi	Municipality	35798	7160	1854	228	6000
Bhawigga	Municipality	52949	10590	2743	337	8874
Loharpatti	Municipality	45217	9043	2342	288	7578
Balawa	Municipality	47865	9573	2479	305	8022
Rem Gopelpur	Municipality	33962	6792	1759	216	5692
Samsi	Rural Municipality	38023	7605	1970	242	6373
Manara Shisawa	Municipality	56868	11334	2935	361	9498
Endera	Rural Municipality	33025	6605	1711	210	5535
Menottari	Rural Municipality	31344	6269	1624	200	5253
Pipara	Rural Municipality	40949	8190	2121	261	6863
Meithan	Municipality	35073	7015	1817	223	5878
Jalesthwor	Municipality	68546	13709	3551	437	11488

Name	Type	Total Population	50+ Population	Total refractive error	Uncorrected refractive error	Uncorrected Presbyopia
Sarlahi	District	903458	180692	46799	5756	151420
Lalbandi	Municipality	71064	14213	3681	453	11910
Harmati	Municipality	52312	10452	2710	333	8767
Begmati	Municipality	48116	9623	2492	307	8064
Bardhathawa	Municipality	82203	16441	4258	524	13777
Harjour	Municipality	43856	8771	2272	279	7350
Ishwarpur	Municipality	70506	14101	3652	449	11817
Harlourwa	Municipality	42038	8404	2177	268	7042
Poise	Rural Municipality	25184	5039	1305	161	4223
Brahmapuri	Rural Municipality	34625	6925	1794	221	5803
Chandranagaon	Rural Municipality	38916	7783	2016	248	6522
Kabilesi	Municipality	49320	9864	2555	314	8266
Chakravatta	Rural Municipality	32546	6509	1686	207	5455
Baburaya	Rural Municipality	27575	5515	1428	176	4622
Dhenkeli	Rural Municipality	28864	5773	1495	184	4838
Ramnagar	Rural Municipality	33698	6740	1746	215	5648
Balara	Municipality	53340	10568	2763	340	8940
Godeita	Municipality	55568	11133	2883	355	9329
Bishnu	Rural Municipality	28901	5780	1497	184	4844
Kaudena	Rural Municipality	30436	6087	1577	194	5101
Melangewa	Municipality	54315	10861	2813	346	9102
Rautahat	District	854640	170928	44270	5045	143238
Chandrapur	Municipality	92832	18566	4809	591	15559
Gujara	Municipality	58857	11671	3023	372	9781
Fatuwa Bijayapur	Municipality	45276	9055	2345	268	7588
Katiharyek	Municipality	47451	9490	2458	302	7953
Brindaban	Municipality	53037	10807	2747	338	8889
Gadhimali	Municipality	50349	10070	2608	321	8438
Madhyav Narayan	Municipality	43575	8713	2257	278	7303
Garude	Municipality	62297	12459	3227	397	10441
Dewahi Gonahi	Municipality	39609	7922	2052	252	6638
Malulpur	Municipality	32584	6519	1688	208	5463
Baudhinei	Municipality	41056	8211	2127	262	6881
Panha	Municipality	46266	9253	2397	295	7754
Rajpur	Municipality	49915	9983	2586	318	8366
Yamuneshwar	Rural Municipality	29439	5888	1525	188	4934
Durga Bhagawati	Rural Municipality	28522	5704	1477	182	4780
Rajdevi	Municipality	38219	7644	1980	244	6406
Gaur	Municipality	44328	8905	2307	264	7463
Ishanath	Municipality	51318	10264	2658	327	8601
Bans	District	839302	167860	43476	5348	140667
Nigadhi	Municipality	44444	8889	2302	283	7449
Kohawali	Municipality	54663	10993	2832	348	9162
Jharpur Simara	Sub Metropolitan City	146639	29328	7596	934	24577
Parwanipur	Rural Municipality	27528	5526	1431	178	4630
Prasun	Rural Municipality	30310	6062	1570	193	5080
Bishrampur	Rural Municipality	28773	5755	1490	183	4822
Pheta	Rural Municipality	30856	6171	1598	197	5171
Kalyata	Sub Metropolitan City	149795	29959	7759	954	25105
Keraiyamai	Rural Municipality	32468	6494	1682	207	5442
Bargadhi	Rural Municipality	33765	6653	1723	212	5375
Adarsa Kotwal	Rural Municipality	33192	6638	1719	211	5563
Simroongadhi	Municipality	58730	11746	3042	374	9843
Pacherutu	Municipality	43159	8232	2132	262	6898
Mahagadhimai	Municipality	63592	12718	3294	405	10658
Devital	Rural Municipality	28193	5639	1460	180	4725
Subarni	Rural Municipality	35595	7119	1844	227	5966
Paro	District	723304	144861	37467	4608	121226
Thor	Rural Municipality	25577	5115	1325	163	4287
Jirabhawani	Rural Municipality	27531	5306	1426	175	4614
Jagarnathpur	Rural Municipality	38999	7800	2020	248	6536
Peterwa Sagguli	Rural Municipality	28794	5759	1492	183	4826
Sethuwa Pressuni	Rural Municipality	39507	7901	2046	252	6621
Pansagadi	Municipality	46616	9323	2419	297	7813
Birgunj	Metropolitan City	291415	58283	15095	1857	48841
Bahudarmai	Municipality	47293	9459	2450	301	7926
Pokharya	Municipality	42313	8463	2192	270	7092
Kalkikemel	Rural Municipality	25326	5065	1312	161	4245
Dhobni	Rural Municipality	23873	4775	1237	152	4001
Chilipaharmal	Rural Municipality	31897	6379	1652	203	5346
Pakaha Meinapur	Rural Municipality	24906	4981	1290	159	4174
Bindibesini	Rural Municipality	29257	5851	1516	186	4903



Ref. No.

तमसोमा ज्योतिर्गमय  
नेपाल नेत्रज्योति संघ  
NEPAL NETRA JYOTI SANGH  
(National Society for Comprehensive Eye Care)  
CENTRAL OFFICE

2030  
IN SIGHT

(Translation)

Government of Nepal  
Ministry of Health and Population  
Department of Health Services  
(HR Administration Department)

Fiscal year-074/075  
Letter no-4037

July 05, 2018

Subject: For necessary support

To 77 Districts Health Offices/Public Health Offices  
And all Municipalities-Health Department

We are writing to inform you about an important initiative as per the letter received from Nepal Netra Jyoti Sangh (NNJS), dated July 5, 2018 (Letter No. 336/075-075). In alignment with the goal of enhancing eye health services and developing an eye health strategy under the Vision 2020: The Right to Sight initiative, NNJS, with the support of various donor organizations, will be conducting the Rapid Assessment of Avoidable Blindness (RAAB) Survey across all districts of Nepal.

To ensure the successful execution of this survey, we request the cooperation and support of all Health Offices, District Public Health Offices, local governments, and municipal health departments throughout Nepal.

Dipak Rijal

Section officer

Commitment of Civil Service Employees: Ensuring Transparency and Streamlined Services"

Translated by: Mr. Ranjan Shah  
National RAAB Survey Coordinator



Netra Jyoti Bhawan, P. O. Box: 335,  
Tripureshwor Kathmandu, Nepal



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www.nnjs.org.np



नेपाल सरकार  
स्वास्थ्य तथा जनसंख्या मन्त्रालय

**स्वास्थ्य सेवा विभाग**  
(कर्मचारी प्रशासन शाखा)

प. स. अ. प. ०३८/०३९  
संलग्न नं. ४०३।

मा. ५५६७८२  
मा. ५५६७८३  
मेल: [www.dols.gov.np](http://www.dols.gov.np)  
फोन:  
परामी ट्रेन, काठमाडौं

मिति: २०७५/०३/२१

विषय: आवश्यक सहयोग सम्बन्धमा।

श्री ७३ जिल्ला स्वास्थ्य/जनस्वास्थ्य कार्यालय र  
सबै पालिका स्वास्थ्य शाखा।

प्रस्तुत विषयमा नेपाल नेपाली संघको प.स. ०३४/७५ च.न. ३३६ मिति २०७५/०३/२१ को पचानुसार  
आद्या स्वास्थ्य सेवाको प्रभावकारीता बढाउने सम्पादनकूल रणनीति तयार पारी Vision 2020 : The Right  
to Sight को उद्देश्य परिपूर्ति लागि नेपाल नेपाली संघ र विभिन्न दातृ निकायहरुको सहकार्यमा जुलाई, २०१८ देखि क्रमिक रूपमा सबै जिल्लाहरमा RAAB Survey 2018 सञ्चालन हुने भएको हुँदा तहीं जिल्ला  
स्वास्थ्य/जनस्वास्थ्य कार्यालय तथा पालिका स्वास्थ्य शाखाबाट नियमानुसार आवश्यक सहयोग गरिएनुहुन  
निर्णयानुसार अनुरोध छ।

(दीपक रिमाल)  
शाखा अधिकारी

"निजामती कर्मचारीको प्रतिबद्धता : पारदर्शीता र चुस्तता"



**Government of Nepal**  
**Nepal Health Research Council (NHRC)**  
**Estd. 1991**



Ref. No.: 1629

18 December 2019

Mr. Sailesh Kumar Mishra

Principal Investigator

Nepal Netra Jyoti Sangh

Tripureshwor, Kathmandu

Ref: Approval of research proposal

Dear Mr. Mishra,

This is to certify that the following protocol and related documents have been granted approval by the Ethical Review Board, NHRC for implementation.

If the researcher requires transfer of the bio-samples to other countries, the investigator should apply to the NHRC for the permission. The researchers will not be allowed to ship any raw/crude human biomaterial outside the country, only extracted and amplified samples can be taken to laboratories outside of Nepal for specific study, as per the protocol submitted and approved by the NHRC. The remaining samples of the lab should be destroyed as per standard operating procedure and the process should be documented and informed to the NHRC timely.

ERB Protocol No	804/2019	Sponsor Protocol No	NA
Principal Investigator/s	Mr. Sailesh Kumar Mishra	Sponsor	NA
Title	Rapid assessment of avoidable blindness (RAAB) survey in province Two, Nepal		
Protocol Version No	Version 3.0	Version Date	29 November 2019
ICF Version No. (V.N.)	Version 3.0	Version Date	29 November 2019
Other Documents			
1. Data Collection Tools 2. DoHS letter			
Members of research team	1. Mr. Ranjan Shah		
Study Site	Province 2, Nepal		



Government of Nepal  
**Nepal Health Research Council (NHRC)**



Estd. 1991

Ref. No.: 1429

Type of Review	<input type="checkbox"/>	Expedited	Duration of Approval	Frequency of continuing review			
	<input checked="" type="checkbox"/>	Full Board	18 December 2019 to 18 December 2020				
Meeting Date:		11 December 2019					
Total budget of research	NRs 10,54,400.00						
Ethical review processing fee	NRs 31,632.00						
Executive Chief of NHRC	Name			Date			
	Prof. Dr. Anjani Kumar Jha			18 December 2019			
<b>Investigator Responsibilities</b>							
<ul style="list-style-type: none"><li>• Any amendments shall be approved from the ERB before implementing them</li><li>• Submit Serious Adverse Events (SAE) and Suspected Unexpected Serious Adverse Reaction (SUSAR) reports to the ERB within 48hours</li><li>• Submit progress report every 3 months</li><li>• Submit final report after completion of protocol procedures at the study site</li><li>• Report protocol deviation / violation within 7 days</li><li>• Comply with all relevant international and NHRC guidelines</li><li>• Abide by the principles of Good Clinical Practice and ethical conduct of the research</li></ul>							

If you have any questions, please contact the Ethical Review M & E Section at NHRC.

Thanking you,

Prof. Dr. Anjani Kumar Jha  
Executive Chairperson

**ANNEXURE-X**

<b>RAPID ASSESSMENT FOR AVOIDABLE BLINDNESS</b>							
<b>A. GENERAL INFORMATION</b>							
Survey area:				Year - month:		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/>	
Name:				Cluster:	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Individual no.:	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
				Sex:	Male: <input type="radio"/> (1) Female: <input type="radio"/> (2)	Age (years):	
Optional 1: <input type="checkbox"/> <input type="checkbox"/>		Examination status:		Examined: <input type="radio"/> (1) (go to B) Not available: <input type="radio"/> (2) (go to E)		Refused: <input type="radio"/> (3) (go to E) Not able to communicate: <input type="radio"/> (4) (go to E)	
Always ask: "Did you ever have any problems with your eyes?" Yes: <input type="radio"/> (1) No: <input type="radio"/> (2)							
If not available - details (availability / tel number / address)							
<b>B. VISION</b>				<b>C. LENS EXAMINATION</b>			
Uses distance glasses:		No: <input type="radio"/> (1)	Yes: <input type="radio"/> (2)	Normal lens / minimal lens opacity:		<input type="radio"/> (1)	<input type="radio"/> (1)
Uses reading glasses:		No: <input type="radio"/> (1)	Yes: <input type="radio"/> (2)	Obvious lens opacity:		<input type="radio"/> (2)	<input type="radio"/> (2)
<b>Presenting vision</b>		<b>Right eye</b>	<b>Left eye</b>	Lens absent (aphakia):		<input type="radio"/> (3)	<input type="radio"/> (3)
Can see 6/12		<input type="radio"/> (1)	<input type="radio"/> (1)	Pseudophakia without PCO:		<input type="radio"/> (4)	<input type="radio"/> (4)
Cannot see 6/12 but can see 6/18		<input type="radio"/> (2)	<input type="radio"/> (2)	Pseudophakia with PCO:		<input type="radio"/> (5)	<input type="radio"/> (5)
Cannot see 6/18 but can see 6/60		<input type="radio"/> (3)	<input type="radio"/> (3)	No view of lens:		<input type="radio"/> (6)	<input type="radio"/> (6)
Cannot see 6/60 but can see 3/60		<input type="radio"/> (4)	<input type="radio"/> (4)				
Cannot see 3/60 but can see 1/60		<input type="radio"/> (5)	<input type="radio"/> (5)				
Light perception (PL+)		<input type="radio"/> (6)	<input type="radio"/> (6)				
No light perception (PL-)		<input type="radio"/> (7)	<input type="radio"/> (7)				
<b>D. MAIN CAUSE OF PRESENTING VA&lt;6/12</b> (Mark only one cause for each eye)				<b>Principal cause in person</b>			
<b>Pinhole vision</b>		<b>Right eye</b>	<b>Left eye</b>	<b>Right eye</b>	<b>Left eye</b>		
Can see 6/12		<input type="radio"/> (1)	<input type="radio"/> (1)	<input type="radio"/> (1)	<input type="radio"/> (1)	<input type="radio"/> (1)	
Cannot see 6/12 but can see 6/18		<input type="radio"/> (2)	<input type="radio"/> (2)	<input type="radio"/> (2)	<input type="radio"/> (2)	<input type="radio"/> (2)	
Cannot see 6/18 but can see 6/60		<input type="radio"/> (3)	<input type="radio"/> (3)	<input type="radio"/> (3)	<input type="radio"/> (3)	<input type="radio"/> (3) (F)	
Cannot see 6/60 but can see 3/60		<input type="radio"/> (4)	<input type="radio"/> (4)	<input type="radio"/> (4)	<input type="radio"/> (4)	<input type="radio"/> (4)	
Cannot see 3/60 but can see 1/60		<input type="radio"/> (5)	<input type="radio"/> (5)	<input type="radio"/> (5)	<input type="radio"/> (5)	<input type="radio"/> (5)	
Light perception (PL+)		<input type="radio"/> (6)	<input type="radio"/> (6)	<input type="radio"/> (6)	<input type="radio"/> (6)	<input type="radio"/> (6)	
No light perception (PL-)		<input type="radio"/> (7)	<input type="radio"/> (7)	<input type="radio"/> (7)	<input type="radio"/> (7)	<input type="radio"/> (7)	
<b>E. HISTORY, IF NOT EXAMINED</b> (From relative or neighbour)							
<b>Believed</b>		<b>Right eye</b>	<b>Left eye</b>				
Not blind		<input type="radio"/> (1)	<input type="radio"/> (1)				
Blind due to cataract		<input type="radio"/> (2)	<input type="radio"/> (2)				
Blind due to other causes		<input type="radio"/> (3)	<input type="radio"/> (3)				
Operated for cataract		<input type="radio"/> (4)	<input type="radio"/> (4)				
<b>F. WHY CATARACT SURGERY WAS NOT DONE</b> (Mark up to 2 responses, if VA<6/18, not improving with pinhole, with visually impairing lens opacity in one or both eyes)							
Need not felt		<input type="radio"/> (1)					
Fear of surgery or poor result		<input type="radio"/> (2)					
Cannot afford operation		<input type="radio"/> (3)					
Treatment denied by provider		<input type="radio"/> (4)					
Unaware that treatment is possible		<input type="radio"/> (5)					
No access to treatment		<input type="radio"/> (6)					
Local reason (optional)		<input type="radio"/> (7)					
<b>G. DETAILS ABOUT CATARACT OPERATION</b>							
<b>Age at operation (years)</b>				<b>Right eye</b>	<b>Left eye</b>		
<b>Place of operation</b>							
Government hospital				<input type="radio"/> (1)	<input type="radio"/> (1)		
Voluntary / charitable hospital				<input type="radio"/> (2)	<input type="radio"/> (2)		
Private hospital				<input type="radio"/> (3)	<input type="radio"/> (3)		
Eye camp / improvised setting				<input type="radio"/> (4)	<input type="radio"/> (4)		
Traditional setting				<input type="radio"/> (5)	<input type="radio"/> (5)		
<b>Type of surgery</b>							
Non IOL				<input type="radio"/> (1)	<input type="radio"/> (1)		
IOL implant				<input type="radio"/> (2)	<input type="radio"/> (2)		
Couching				<input type="radio"/> (3)	<input type="radio"/> (3)		
<b>Cost of surgery</b>							
Totally free				<input type="radio"/> (1)	<input type="radio"/> (1)		
Partially free				<input type="radio"/> (2)	<input type="radio"/> (2)		
Fully paid				<input type="radio"/> (3)	<input type="radio"/> (3)		
<b>Cause of VA&lt;6/12 after cataract surgery</b>							
Ocular comorbidity (Selection)				<input type="radio"/> (1)	<input type="radio"/> (1)		
Operative complications (Surgery)				<input type="radio"/> (2)	<input type="radio"/> (2)		
Refractive error (Spectacles)				<input type="radio"/> (3)	<input type="radio"/> (3)		
Longterm complications (Sequelae)				<input type="radio"/> (4)	<input type="radio"/> (4)		
Does not apply - can see 6/12				<input type="radio"/> (5)	<input type="radio"/> (5)		

**ANNEXURE-XI**

<b>DIABETES AND DIABETIC RETINOPATHY</b>				
<b>H. Diabetes Assessment</b> (complete for everyone)				
1 Have you ever been told by a doctor or nurse that you have diabetes, sugar in your urine or high blood sugar?	No <input type="radio"/> (1) Yes <input type="radio"/> (2)			
2 Action: Measure blood sugar	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	mg/dl	3 Refused blood test	<input type="radio"/>
<b>I. Questions for known diabetics</b> (i.e. said 'YES' to question H1)				
4 What age were you when you were told you had diabetes?	<input type="checkbox"/> <input type="checkbox"/> Years			
5 Are you currently receiving treatment for diabetes? - If 'Yes', what type of treatment do you receive?	No <input type="radio"/> Yes <input type="radio"/>	No treatment <input type="radio"/> (1) Diet only <input type="radio"/> (2) Tablets <input type="radio"/> (3) Insulin <input type="radio"/> (4) Tablets and insulin <input type="radio"/> (5) Other <input type="radio"/> (6)		
6 Before today, have you ever had your eyes examined because of your diabetes e.g. drops were put in your eyes before the examination or a photograph was taken of the back of your eye? - If 'Yes', when was the last time you had your eyes examined because of your diabetes?	No <input type="radio"/> Yes <input type="radio"/>	Not examined <input type="radio"/> (1) 0-12 months ago <input type="radio"/> (2) 13-24 months ago <input type="radio"/> (3) >24 months ago <input type="radio"/> (4)		
<b>J. Diabetic retinopathy assessment</b> Complete if known diabetic ('YES' to H1) or if blood sugar ≥200mg/dl				
7 Examination method:	dilatation and fundoscopy <input type="radio"/> (1) fundus camera <input type="radio"/> (2) refused dilatation and/or fundus photograph <input type="radio"/> (3)			
8 Retinopathy		<b>Right Eye</b>	<b>Left Eye</b>	
R0 (No visible retinopathy)		<input type="radio"/> (1)	<input type="radio"/> (1)	
R1 (mild)*		<input type="radio"/> (2)	<input type="radio"/> (2)	
R2 (observable background)*		<input type="radio"/> (3)	<input type="radio"/> (3)	
R3 (referable)*		<input type="radio"/> (4)	<input type="radio"/> (4)	
R4 (proliferative)*		<input type="radio"/> (5)	<input type="radio"/> (5)	
R6 (Not adequately visualized)*		<input type="radio"/> (6)	<input type="radio"/> (6)	
Reason not adequately visualised?				
9 Maculopathy				
M0 (No maculopathy)		<input type="radio"/> (1)	<input type="radio"/> (1)	
M1 (Observable)*		<input type="radio"/> (2)	<input type="radio"/> (2)	
M2 (Referable)*		<input type="radio"/> (3)	<input type="radio"/> (3)	
M6 (Not adequately visualized)*		<input type="radio"/> (4)	<input type="radio"/> (4)	
10 Laser photocoagulation scars				
Laser scars absent		<input type="radio"/> (1)	<input type="radio"/> (1)	
Scars present – pan retinal laser		<input type="radio"/> (2)	<input type="radio"/> (2)	
Scars present – macular laser		<input type="radio"/> (3)	<input type="radio"/> (3)	
Scars present – pan retinal and macular laser		<input type="radio"/> (4)	<input type="radio"/> (4)	
Not adequately visualized*		<input type="radio"/> (5)	<input type="radio"/> (5)	

\*Refer if newly diagnosed/uncontrolled diabetes. Refer if any signs of retinopathy or if not visualized (R1-6/M1-M6)

**ANNEXURE-XII****RANDOMLY SELECTED POPULATION UNITS IN SURVEY AREA**

Date and time of report :

09-09-2019

19:34:26

This report is for the survey area

<b>Cluster No.</b>	<b>Code</b>	<b>Name of population unit</b>	<b>Population</b>
1	2000805	Saptari Banarjhula 5	520
2	2001806	Saptari Bhagawatpur 6	360
3	2002606	Saptari Brahmapur 6	419
4	2003405	Saptari Dhodhanpur 5	944
5	2004307	Saptari Goithi 7	295
6	2005203	Saptari Jamunimadhepura 3	774
7	2006009	Saptari Kamalpur 9	371
8	2006905	Saptari Kushaha 5	819
9	2007806	Saptari Malekpur 6	848
10	2008606	Saptari Negada 6	508
11	2009509	Saptari Portaha 9	351
12	2009803	Saptari Ramnagar 3	275
13	2010607	Saptari Saraswor 7	350
14	2011509	Saptari Trikaula 9	416
15	2100701	Siraha Badharamal 1	2365
16	2101409	Siraha Bhadaiya 9	233
17	2102309	Siraha Bishnupurkatti 9	1,133
18	2103203	Siraha Dhodhana 3	485
19	2104003	Siraha Govindapur Malahanaima 3	609
20	2104803	Siraha Itari Parsahi 3	360
21	2105702	Siraha Karjanha 2	646
22	2106403	Siraha Lahan Municipality 3	4,459
23	2106909	Siraha Madar 9	962
24	2108004	Siraha Muksar 4	229
25	2108901	Siraha Rajpur 1	613
26	2109609	Siraha Silorba Pachhawari 9	530
27	2110009	Siraha Sitapur Pra.Ra. 9	659
28	2200205	Dhanusa Aurahi 5	494
29	2201105	Dhanusa Baniniya 5	286
30	2201709	Dhanusa Begadawar 9	2,266
31	2202406	Dhanusa Chora Koilpur 6	338
32	2203005	Dhanusa Dhanauji 5	1,314
33	2203605	Dhanusa Ekarahi 5	914
34	2204307	Dhanusa Hansapur Kathpula 7	46
35	2204903	Dhanusa Janakpur Municipality 3	1,868
36	2204909	Dhanusa Janakpur Municipality 9	6,399
37	2205201	Dhanusa Kachuri Thera 1	369
38	2205902	Dhanusa Lagima Gadhaguthi 2	479

Cluster No.	Code	Name of population unit	Population
39	2206703	Dhanusa Mahuwa (Praganna Koradi) 3	501
40	2207409	Dhanusa Nakatajhijh 9	1,103
41	2208304	Dhanusa Ramadaiya Bhawadi 4	325
42	2208709	Dhanusa Satosar 9	801
43	2209403	Dhanusa Tarapatti Sirsiya 3	400
44	2210104	Dhanusa Yadukooha 4	621
45	2300408	Mahottari Bagada 8	448
46	2301003	Mahottari Basabitti 3	312
47	2301602	Mahottari Bramarpura 2	1,643
48	2302008	Mahottari Dhirapur 8	828
49	2302609	Mahottari Gaidaha Bhetpur 9	707
50	2303205	Mahottari Hathilet 5	821
51	2303603	Mahottari Khayar Mara 3	490
52	2304104	Mahottari Laximiniya 4	1,663
53	2304606	Mahottari Majhora Bishnupur 6	662
54	2305208	Mahottari Paraul 8	717
55	2305909	Mahottari Raghunathpur 9	592
56	2306603	Mahottari Sarpallo 3	1,521
57	2307102	Mahottari Sisawakataiya 2	1,055
58	2307605	Mahottari Sundarpur 5	1,918
59	2400506	Sarlahi Babarganj 6	976
60	2401101	Sarlahi Basantapur 1	1,526
61	2401805	Sarlahi Bhaktipur 5	2,111
62	2402509	Sarlahi Dhanakaul Pachhawari 9	38
63	2403106	Sarlahi Farahadawa 6	644
64	2403702	Sarlahi Hajariya 2	1,221
65	2404009	Sarlahi Haripurwa 9	1,883
66	2404402	Sarlahi Ishworpur 2	4,611
67	2404908	Sarlahi Kabilasi 8	1,695
68	2405509	Sarlahi Khutauna 9	576
69	2406106	Sarlahi Madhubangoth 6	655
70	2406607	Sarlahi Mirjapur 7	165
71	2407309	Sarlahi Netraganj 9	741
72	2408001	Sarlahi Pipariya 1	705
73	2408802	Sarlahi Salempur 2	890
74	2409407	Sarlahi Simara 7	1,232
75	2500105	Rautahat Ajagabi 5	327
76	2500905	Rautahat Bariyarpur 5	1,059
77	2501608	Rautahat Bishrampur 8	2,451
78	2502102	Rautahat Dharampur 2	1,263
79	2502907	Rautahat Gamhariya Birta 7	798

Cluster No.	Code	Name of population unit	Population
80	2503311	Rautahat Gaur Municipality 11	2,541
81	2504104	Rautahat Jayanagar 4	661
82	2504704	Rautahat Kakanpur 4	784
83	2505304	Rautahat Laxmipur (Do.) 4	453
84	2506103	Rautahat Mathiya 3	532
85	2506902	Rautahat Paurai 2	601
86	2507505	Rautahat Pothiyahi 5	1,542
87	2508009	Rautahat Rajpur Farhadawa 9	2,836
88	2508609	Rautahat Sakuwa Dhamaura 9	2,240
89	2509107	Rautahat Sarmujawa 7	883
90	2600102	Bara Amab 2	1,052
91	2600906	Bara Baghwan 6	845
92	2601605	Bara Batara 5	326
93	2602302	Bara Bhawanipur Jitpur 2	698
94	2602907	Bara Chhata Pipra 7	621
95	2603506	Bara Dumarwana 6	2,350
96	2604203	Bara Hariharpur 3	478
97	2604803	Bara Kabahigoth 3	376
98	2605206	Bara Kalaiya Municipality 6	2,999
99	2605706	Bara Kudawa 6	517
100	2606408	Bara Manaharwa 8	286
101	2607101	Bara Pathara 1	991
102	2607604	Bara Piparpati Parchrouwa 4	328
103	2608305	Bara Purainiya 5	562
104	2609004	Bara Shreenagar Bairiya 4	279
105	2609908	Bara Umarjan 8	416
106	2700704	Parsa Bahuarbabhatha 4	774
107	2701402	Parsa Bhaurtar 2	775
108	2702109	Parsa Biranchibarwa 9	343
109	2702210	Parsa Birgunj Sub-Metropolitan City 10	7,359
110	2702215	Parsa Birgunj Sub-Metropolitan City 15	8,489
111	2702302	Parsa Biruwaguthi 2	,385
112	2703005	Parsa Gamhariya 5	58
113	2704005	Parsa Jeetpur 5	623
114	2704902	Parsa Mahadevpatti 2	971
115	2705703	Parsa Nirmal Basti 3 8	59
116	2706504	Parsa Prasurampur 4	405
117	2707408	Parsa Sirsiya (Nau.Ta.Ja.) 8	262
118	2708306	Parsa Udayapur Ghurmi 6	957

**ANNEXURE-XIII**







Nepal Netra Jyoti Sangh

# GAUR EYE HOSPITAL

To provide preventive and curative eye care services to underprivileged people at cheaper cost & to empower people to their eye health by providing eye care health education in the community.



Gaur Municipality Ward No-8, (Purenwa),  
Rautahat, Nepal | Phone No: 055-520039  
Email: info.geh@gmail.com | Website: www.geh.org.np

## OUR SERVICES:

- General Ophthalmology
- OPD Services
- Eye Surgeries
- Inpatient Services
- Emergency Service
- Primary Ear Care Service
- SUPPORT SERVICES**
- Laboratory Service
- Pharmacy
- Optical
- OUT REACH**
- DST/ Surgical Eye Camp
- School Screening
- Eye Health Education Training and Awareness Activities



**Nepal Netra Jyoti Sangh**

Central Office

Tripureshwor, Kathmandu



**Gaur Eye Hospital**

Purenwa, Gaur



**Sagarmatha Choudhary Eye Hospital**

Lahan, Siraha



Ram Kumar Mahabir Prasad

**Kedia Eye Hospital**

Parwanipur-4, Birganj, Nepal

जीवनपर्यन्त रक्तदान, जीवनोपरान्त नेत्रदान



तमसोमा ज्योतिस्तमय  
**नेपाल नेत्रज्योति संघ**  
**NEPAL NETRA JYOTI SANGH**  
(National Society for Comprehensive Eye Care)  
**CENTRAL OFFICE**

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