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Conducted by
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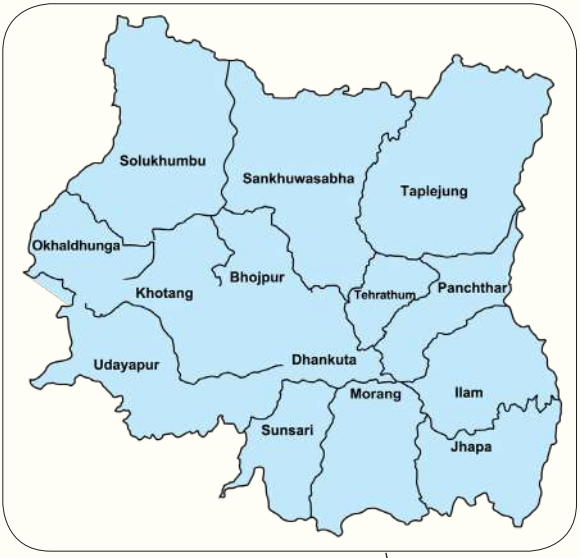
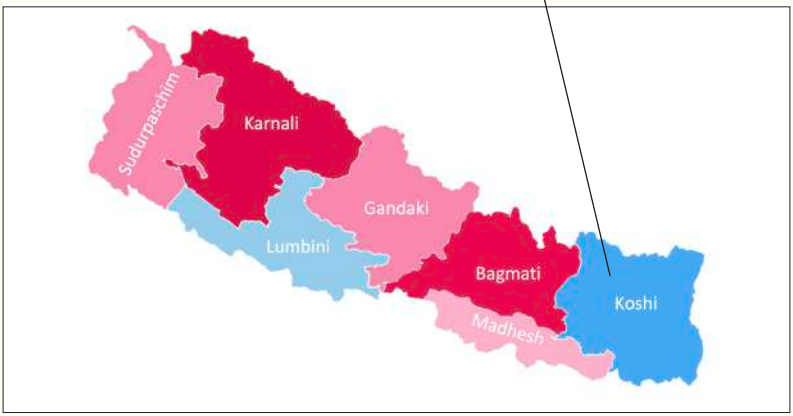
A Report of Rapid Assessment of Avoidable Blindness Survey 2019

KOSHI PROVINCE

Koshi Province





Message

I am happy to learn that the Nepal Netra Jyoti Sangh Biratnagar Eye Hospital has produced a brief book titled “Rapid Assessment of Avoidable Blindness survey report (RAAB-2019)” for the province of Koshi, Nepal. This is a noteworthy achievement for the eye health services in the Koshi province. The purpose of this report is to assist the Ministry of Health & Social Development of Koshi province and other stakeholders in the field of eye care in expanding the reach of eye care services to rural and remote hilly areas. It undoubtedly directs us toward achieving the sustainable development goal and the ending avoidable sight loss goals of 2030 In Sight.

Since 1980, NGOs and INGOs have provided support in a number of areas, including eye health. In South Asia, Nepal’s health sector cooperation model is a widely recognized example program. Over the past four decades, NGo and INGO have made important contributions to the prevention of blindness in Nepal. Koshi province has a medium prevalence of blindness than other provinces, thus the public-private partnership (PPP) model developed by the Nepali government will be the most effective strategy to battle blindness in this region. I should point out that the Ministry of health has already begun using the public-private partnership strategy for integrating eye care into general healthcare.

I would want to express my gratitude to the Donor organization for organizing the efforts of many stakeholders in eye care and taking the lead in survey execution. In the upcoming days, I hope to witness even more impressive advancements in the field of eye care. Lastly, but just as importantly, I would like to thank all the participants in this service, the survey experts, and the report’s preparation team. I am hoping that this report will offer fresh, evidence-based information with detailed planning for the future of the eye care system in the Nepalese region of Koshi province.

Hon. Hikmat Kumar Karki
Chief Minister of Koshi Province

Message

It gives me great joy to learn that the Nepal Netra Jyoti Sangh Biratnagar Eye Hospital has released the first-ever province "Rapid Assessment of Avoidable Blindness Survey report 2019" in the form of a short book.

The eye care program in Nepal has been handled by NGOs for the past four decades, and they have made significant contributions to the government's efforts to prevent blindness. It is admirable that eye care providers are making an effort to improve the quality of their services.

For the purpose of planning future eye care services, this study will offer evidence based information about the current state of blindness in the Koshi Province. The study also looks at how current stakeholders might collaborate to create an integrated, all-encompassing plan for eye care in order to lower the rate of preventable blindness in Koshi province.

Every stakeholder's initiative and effort have made all of this possible. I want to express my gratitude to all parties involved for their contributions to the provincial survey's success. Last but not least, we would like to express our gratitude to the ophthalmologists, Ophthalmic Assistant, and other hospital employee for their work as a field work expert for the RAAB survey.

Dr. Radhika Thapalia
Health Secretaty, Ministry of Health
Koshi Province

Message

We are delighted to announce that Nepal Netra Jyoti Sangh Biratnagar Eye Hospital, along with other stakeholders in eye care, are working together to publish the Rapid Assessment of Avoidable Blindness (RAAB-2019) survey report into a book.

It goes without saying that this study will offer a clear understanding of the state of eye care in the province of Koshi and lay a solid foundation for future planning and the creation of new eye care initiatives for the region. The province still lacks easily accessible, high-quality eye care services, but I have faith that this study will help us realize this goal.

I want to express my gratitude to every single person and organization that helped make the RAAB survey a success, whether directly or indirectly, for this significant accomplishment. Last but not least, I would like to express my gratitude to Eye Care Foundation and CBM Global for the financial support as well as Mr. Y.D. Sapkota of IAPB for his work as an expert on the RAAB survey.

Prof. Chet Raj Pant
Chairman, Nepal Netra Jyoti Sangh

Message

It brings me great pleasure to learn that Nepal Netra Jyoti Sangh Biratnagar Eye Hospital is publishing the provincial "The Rapid Assessment of Avoidable Blindness Survey report (RAAB-2019) 2019 of Koshi province Nepal" as a book.

Over the past thirty years, non-governmental organizations have prioritized efforts to combat blindness by reducing serious blindness through hospital and outreach programs. This is an effective illustration of a public-private partnership in the field of eye care.

Beyond the district headquarters throughout the province of Koshi, the eye care services must be further expanded in order to meet the national goals of 2030 In Sight and Sustainable Development Goals. The Koshi province Ministry of Health has already begun expanding its eye care services into general health care under a partnership approach in order to achieve this goal.

This report presents data about blindness that is supported by evidence, as well as the results of eye care services that are now offered in the province of Koshi. In the process of preventing blindness in the province of Koshi, I hope that this information will be helpful in planning future eye care services. I am hoping that the survey results will serve as a roadmap for achieving prov- incewide coverage for eye health services.

I would like to express my gratitude to Biratnagar Eye Hospital for initiating and coordinating the Survey's implementation with all relevant parties. In a similar vein, I want to express my gratitude to all those involved for helping to carry out the survey.

Shyam Sundar Udas
President
NNJS Koshi Province

Message

I am delighted to announce that Biratnagar Eye Hospital will be publishing the 2019 RABB survey report for the province of Koshi. With reference to the state of eye health services in western Nepal, I hope and anticipate that this book will serve as the primary source of information. Furthermore, it will serve as an excellent summary of our efforts over the previous twenty years and a roadmap for developing new strategic initiatives for the eye care industry going forward.

Modern technology and the ongoing commitment of those working in this sector of work have led to an expansion of the eye care services in Nepal. Under the direction of the central NNJS, we are offering both foreign and Nepalese people comprehensive eye care services. This kind of surveying and the release of the report with the analytical data would undoubtedly serve as a reference for everyone in Nepal who works in the field of eye health.

I would like to express my gratitude to the editorial committee, researchers, data collectors, writers, and Biratnagar Eye Hospital for dedicating their significant time to the development of this important work.

Thank You!

Padma Narayan Chaudhary
Chairman, Hospital Management Committee
Biratnagar Eye Hospital

Message

The provincial level "Rapid Assessment of Avoidable Blindness Survey Report 2019" of Koshi Pradesh has come up first time as a concise book published by Nepal Netra Jyoti Sangh Biratnagar Eye Hospital with the leadership of Ministry of Health, Koshi province and collective efforts of all existing eye care stakeholders.

We are greatly indebted to Ophthalmologist, Ophthalmic Assistant, Eye Health Workers and enumerators who directly involved in the field work reaching household to household in difficult geographic districts. This was not possible without their commitment, dedication and ownership to achieve the objectives of the survey. The survey team did field work in the leadership of 4 different hospital in different district and covered 14 districts of Koshi Pradesh.

We also acknowledge the many contributions made to the completion of the survey by the survey principal investigator, the Public Health Division Head Ministry of Social Development Koshi province, the survey consultant, Mr. YD Sapkota from IAPB South Asia Coordinator, Dr. Mohan Krishna Shrestha from Tilganga Institute of Ophthalmologist, and the survey coordinator, Mr. Rajiv Ranjan Karn from Biratnagar Eye Hospital.

I am appreciative of Biratnagar Eye Hospital, Sagarmatha Choudhary Eye Hospital, Mechi Eye Hospital & Dr. Ram Prasad Pokhrel Eye Hospital, Dhankutta substantial assistance in placing paramedics and ophthalmologists in the field.

I would like to thank the Ministry of Social Development of Koshi province, the Eye Care Foundation, and the CBM Global on behalf of Biratnagar Eye Hospital for their financial support in conducting the provincial-level Rapid Assessment of preventable.

At last, I would like to express my gratitude to all of the respondents who helped make the provincial survey a huge success and to all of those who gave insightful information throughout the field operation.

Dr. Sailesh Kumar Mishra
Executive Director
Nepal Netra Jyoti Sangh

Message

The news that the 2019 RABB survey report will be published by Nepal Netra Jyoti Sangh fills me with great joy. We are all proud that comprehensive eye care services are becoming more accessible to the public and that the eye care industry in Nepal is growing in a distinctive fashion. I have no doubt that the RABB survey report will serve as an invaluable resource for policymakers as they plan and move forward with providing eye care services.

Warmest wishes for further improvement in the quality of eye care services to all staff members and officials in the eye health care system in this province and across the country. Warmest wishes for further improvement in eye care services are extended to all staff members and officials in the eye health care system in this province and across the country.

Thank you !

Dr. Purushottam Joshi
Medical Director
Mechi Eye Hospital

Message

It gives me great joy to learn that the Nepal Netra Jyoti Sangh Biratnagar Eye Hospital has released the first-ever province "Rapid Assessment of Avoidable Blindness Survey report 2019" in the form of a short book.

The eye care program in Nepal has been handled by NGOs for the past four decades, and they have made significant contributions to the government's efforts to prevent blindness. It is admirable that eye care providers are making an effort to improve the quality of their services.

For the purpose of planning future eye care services, this study will offer evidence-based information about the current state of blindness in the Koshi Province. The study also looks at how current stakeholders might collaborate to create an integrated, all-encompassing plan for eye care in order to middle the rate of preventable blindness in the province of Koshi.

Every stakeholder's initiative and effort have made all of this possible. I want to express my gratitude to all parties involved for their contributions to the provincial survey's success. Finally yet importantly, we would like to express our gratitude to the ophthalmologists, Ophthalmic Assistants, and other employee for his work as a field work expert for the RAAB survey.

Sudhir Kumar Thakur
Chief Administrator
Lahan Eye & Ear Care System

Message

I am thrilled to announce that, with the invaluable support of the International Agency for Prevention of Blindness (IAPB), Biratnagar Eye Hospital and its networks have successfully compiled the results of the RAAB survey conducted in Koshi Province.

Since our inception, Biratnagar Eye Hospital has been committed to delivering affordable and compassionate eye care to all members of the community. Our primary focus is on treating irreversible blindness while actively working to prevent avoidable blindness. We take pride in our academic initiatives across various ophthalmology fields and are striving to become a "Centre of Excellence" in line with Nepal Netra Jyoti Sangh (NNJS) Guidelines.

I would like to extend my heartfelt gratitude to the municipal and provincial governments for their unwavering support.

The Covid-19 pandemic presented significant challenges this past year, yet our dedicated hospital staff and NNJS volunteers remained steadfast, motivating and uplifting us every step of the way. I deeply appreciate each and every one of them.

While we recognize that there is always room for improvement, we are committed to advancing our mission of becoming a center of excellence and enhancing patient care.

Ultimately, I believe that the insights gained from the RAAB survey will serve as a vital resource for better planning and strategies to reduce the rate of blindness in Koshi Province.

Dr. Lalit Agarwal
Medical Superintendent
Biratnagar Eye Hospital

Message

The news that the Koshi province's 2019 Rapid Assessment of Avoidable Blindness Survey (RAAB) would be available as a guidebook fills me with great happiness. I want to express my gratitude to the entire team for their dedication and hard work in finishing this survey in specific time.

Over the past forty years, Nepal's eye care industry has advanced remarkably. This study now offers comprehensive, evidence-based information on the state of blindness and eye care services in the province of Koshi. We anticipate that this report will also offer fresh baseline data that will be beneficial for planning at the local government and rural municipality levels. The results of this study will also help to improve Koshi Province's Provincial Eye Health Strategy.

The CBM Global is thrilled to participate in the RAAB survey. CBMG is eager to collaborate closely with regional NNJS partners to eliminate needless blindness in the Koshi area while avoiding resource duplication. As you are all aware, since the Nepal Blindness Survey in 1981, CBM Germany, have been an active partners of NNJS in Nepal. CBM Global is now assisting LEECS.

Connecting the dots between the RAAB survey results from 1980 and 2006 and comparing them with RAAB 2020 is crucial. We can plan and review our plans and expand on our successful work with the aid of this new survey.

Lastly, I would like to thank the workers of our excellent partner hospital once more for completing this crucial survey in the midst of the pandemic. In the upcoming days, CBM Global looks forward to carrying on our collaboration with the Biratnagar Eye Hospital Team.

Rajan Bhattarai
Country Director
CBM Global

Message

It is with great enthusiasm and a deep sense of responsibility that I present the findings of our latest Rapid Assessment of Avoidable Blindness (RAAB) report of Koshi Province. This comprehensive assessment underscores our ongoing commitment to understanding and addressing the challenges within the field of eye care in Koshi Province.

The RAAB report provides critical insights into the prevalence and causes of avoidable blindness, revealing both progress and areas needing further attention. Our findings highlight significant strides made in eye care services, driven by collaborative efforts and innovative approaches. However, they also illuminate gaps that demand our immediate action and strategic response.

As we analyze these results, our focus remains on translating data into impactful interventions. Our goal is to enhance the accessibility, quality, and sustainability of eye care services, ensuring that every individual receives the attention they deserve. This report is not just a reflection of our achievements but a call to action to intensify our efforts, leverage partnerships, and mobilize resources effectively.

I extend my heartfelt gratitude to all those who have contributed to this important work. Your dedication and expertise are invaluable as we work together to eliminate avoidable blindness and improve vision health for all.

Anil Gorkhaly
Country Director
Eye Care Foundation

Report Publication Committee

Mr. Shyam Sundar Udash
President
NNJS Koshi Province

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Hospital Manager
Biratnagar Eye Hospital

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Lahan Eye and Ear Care System

Dr. Purushottam Joshi
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Mechi Eye Hospital

Mr. Prashant Shrestha
Program Officer
Mechi Eye Hospital

Abbreviations

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

Abbreviation Definition

Indicator

DIABETIC RETINOPATHY AND
MAACULOPATHY

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: • dot haemorrhages • micro-aneurysms • hard exudates • cotton wool spots • blot haemorrhages • superficial or flame-shaped haemorrhages
Observable retinopathy	R2	Background retinopathy, defined as four or more blot haemorrhages in one hemi-fields 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: • Four or more blot haemorrhages in both inferior and superior hemi-fields • Venous beading • Intraretinal microvascular abnormalities (IRMA)
Proliferative retinopathy	R4	Proliferative DR, defined as any of the following features: • Active new vessels • Vitreous haemorrhage
Inadequate for retinopathy	R6	Retina not sufficiently visible for assessment
No maculopathy	M0	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 dis 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
Inadequate for maculopathy	M6	Macula not adequately visible for assessment
Sight threatening diabetic retinopathy	STDR	The presence of R4 and/or M2

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EXECUTIVE SUMMARY

Background

The main objective of the Rapid Assessment of Avoidable Blind- ness (RAAB) survey 2019 was to assess the magnitude of blind- ness and visual impairment, its causes and the impact of existing eye care services in Koshi 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 1.0 % (95% CI 0.7-1.3). The crude prevalence of severe vision impairment (SVI), moderate vision impairment (MVI), and early vision impairment (EVI) was 1.4 % (95%CI 1.0-1.8), 5.8 % (95%CI 5.0-6.7) and 8.2% (95%CI 7.2-9.2) respectively.

The age- and sex-adjusted prevalence of blindness was 0.8% (95%CI 0.5-1.1). The age- and sex-adjusted prevalence of SVI, MVI, and EVI were 1.2% (95%CI 0.8-1.6), 5.1% (95%CI 4.3-6.0) and 7.5% (95%CI 6.5-8.4) respectively.

Based on the observed prevalence, an estimated 6,224 people aged 50 and older (2,924 men and 3,300 women) were estimated to be bilaterally blind in Koshi Province. A total of 109,094 people aged 50 and older (48,180 men and 60,914 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 45,017 in this province. A total of 325,117 eyes were found to have vision impairment from all causes (PVA<6/12) including blindness.

Causes of Blindness and Visual Impairment

The main cause of bilateral blindness was untreated cataract (60.0%). Cataract was still the leading cause of SVI (86.4%) and MVI (78.3%). Uncorrected refractive error was the leading cause of EVI (57.7%).

About 75 percent of all blindness in the study population was avoidable. Specifically, 60.0% of blindness was treatable, 10% was preventable through more advanced ophthalmic services 5% was preventable with primary health care and/or primary eye care. Posterior segment disease accounted for 22.5% 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 25% of all blindness that is permanent and untreatable.

Prevalence of Blindness Caused by Cataract and Vision Impairment

The crude prevalence of blindness due to bilateral cataract among people aged 50 years and older was 0.5% (95% CI 0.3-0.7). The crude prevalence of SVI, MVI and EVI due to bilateral cataract were 1.4% (95%CI 1.0-1.7), 4.4% (95%CI 3.6-5.2) and 7.7% (95%CI 6.8-8.7) respectively.

The age- and sex-adjusted prevalence of blindness due to bilateral cataract among people aged 50 years and older was 0.4% (95%CI: 0.2-0.7) corresponding to an estimated 3,238 people aged 50 years and older blind due to cataract in Koshi Province. We also estimated that 22,865 eyes (prevalence 1.5%) are blind due to cataract among people aged 50 years and older in Koshi Province of Nepal.

The age- and sex-adjusted prevalence of SVI due to bilateral cataract was 0.7% (95%CI 0.4-1.0) corresponding to an estimated 5,351 people aged 50 years and older in Koshi Province. The estimated number of eyes with SVI due to cataract was 18,048 (prevalence 1.2%) in the province.

The age- and sex-adjusted prevalence of MVI due to bilateral cataract was 2.6% (95%CI 2.0-3.3) corresponding to an estimated 19,396 people aged 50 years and older in Koshi Province. We also estimated that 57,138 eyes (prevalence 3.8%) are affected by MVI due to cataract.

The age- and sex-adjusted prevalence of EVI due to bilateral cataract was 1.5% (95%CI 0.8-2.2) corresponding to an estimated

22,251 people aged 50 years and older in Koshi Province. We also estimated that 60,891 eyes (prevalence 4.1%) are affected by EVI due to cataract.

The total workload of vision impairment due to bilateral catarac t (BCVA<6/12 in the better eye) is estimated to be 50,236 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 158,942 in this province.

Cataract Surgical Coverage

The cataract surgical coverage (CSC) in persons indicates the proportion of people with cataract at a predefined VA who 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 93.5% 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 84.7% 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 84.0%.

Visual Outcome of Cataract Surgery

In this survey, 97.4% of the total evaluated eyes had an intraocular lens (IOL) implanted. Overall good visual outcome by WHO definition was seen in 81.4% (PVA ≥6/18) and 86.2% (BCVA ≥6/18) of the cataract operated eyes. Overall poor outcome was seen in 7.0% (PVA<6/60) and 6.3% (BCVA <6/60) after cataract surgery.

The main causes of poor visual outcomes following cataract surgery were Comorbidity (47.3%), long term surgical complications (28.4%), immediate surgical complication (17.6%) and other causes were spectacles (6.8%)

Refractive Error, Presbyopia and Functional Low Vision

The prevalence of refractive error was 15.7% among the people 50 years and older. Among those, 5.4% of people aged 50 years and older who had a refractive error did not have glasses. On the other hand, 80.0% 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 Koshi Province was 0.6% (95%CI 0.3-0.9) with an estimated 4,440 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 of cataract surgery services

were Cost (28.8%), local reason (23.3%), lack of felt need (21.9%), Fear (9.6%) and cannot access treatment (9.6%).

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 Koshi 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 cost, lack of felt need and fear of surgery 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 Government of Nepal and the World Health Organization. The survey estimated the 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 (1). 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 (2).

In 1995, a population-based cross-sectional study was conducted among 5112 people aged 45 years and above in Bheri and Lumbini zones of Nepal by using a stratified cluster sampling design. The main purpose of the study was to estimate the prevalence and causes of blindness and visual impairment and to assess the impact after the 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 the 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 (3).

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 (4, 5). 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 59.5% among the cataract blind people (4).

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 cataract blind people (5).

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 Sur- vey. 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 (6).

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 un avoidable vision loss can achieve their full potential, and where there is universal access to comprehensive eye care services (7).

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 the prevalence of avoidable visual impairment by 25% from the baseline of 2010 by 2019. It strongly recommends conducting population-based surveys to provide evidence on the magnitude and causes of blindness and visual impairment for planning and evaluating the impact of eye health programs.

More than 80% of avoidable blindness and visual impairment reside among people aged 50 years and above mainly caused by cataract and uncorrected refractive errors alone (8). So, the greatest gains will be achieved through the reduction of the 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 Blindness (IAPB). Koshi 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 4,961,412. The total number of peo- ple 50 years and above in this province is 1,028,640 (male 505,682 and female 522,958).

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

1.3 Rationale 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 Koshi 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, and the impact of eye care services, in the Koshi Province of Nepal by using an epidemiologically sound survey methodology.

1.5 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
- Prominent barriers to cataract surgical services
- Prevalence of uncorrected refractive errors, presbyopia
- and low vision
- Cause of poor outcome after surgery
- Barriers to cataract surgical services
- Prevalence of uncorrected refractive errors, presbyopia and low vision

CHAPTER II: METHODOLOGY

This cross-sectional population-based blindness survey was conducted in Province 1 of Nepal by using a standardized RAAB methodology in 2019. It was accomplished with technical support from the International Agency for Prevention of Blindness, South East Asia.

2.1 Study Population

The study population was adults living in Koshi 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 4231 people, distributed across 125 clusters of 35 people 50 years or older in each. Sam- ple 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*D. As we used cluster sampling, adjusting the cluster design effect of 1.4 for the cluster size of 35 people with a 10% non-response rate required a sample size was 4231 people. To enroll an adequate sample in the survey, a total of 125 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 125 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 neighbors. 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 a direct ophthalmoscope. The data collection was done in tablets with mRAAB6 data collection software installed.

In Koshi Province DR Module was not used. Only fundus examination was done for the known diabetic cases.

2.6 Ethical Consideration

The survey adhered to the principles outlined in the Declaration of Helsinki. All eligible participants were informed about the survey's purpose and procedures, and written informed consent was obtained prior to their enrollment. This process ensured voluntary participation in both data collection and examination procedures. Additionally, appropriate remedial actions were taken to address any eye or other health-related issues identified among participants.

Ethics approval for the survey was also obtained from the NHRC, under the Ministry of Health, Government of Nepal. A letter from the Department of Health Services (DOHS) was also circulated to local government authorities to ensure necessary cooperation for the survey team and data collection.

2.7 Validity of the Survey

The RAAB survey methodology is a scientifically validated approach endorsed by the ICEH at LSHTM and the WHO for conducting population-based surveys. This method has been employed in over 170 countries for similar assessments. The survey design and technical support were provided by the IAPB, Southeast Asia, and the ICEH at the LSHTM.

Prior to commencing fieldwork, data collection teams underwent standardized training conducted by certified RAAB trainers. In each province, training was led by YD Sapkota, Hans Limburg, and Ian McCornick in Karnali Province. The training program included an inter observer variation exercise and a supervised pilot cluster. All teams were ensured to achieve at least a Kappa score of 0.6 or greater for inter observer agreement on visual acuity, lens status, and assigning the cause of vision impairment.

2.8 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.

S**evere 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): The 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 4,231 people aged 50 years and older, of whom 4,121 were examined. The coverage was 97.4%. A total of 110 (2.6%) eligible individuals were not evaluated for the study purpose due to unavailability, self-refusals and for not being ca pable of communicating. (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	1,900	96.7	49	2.5	7	0.4	9	0.5	**1,965**	100.0
Female	2,221	98.0	35	1.5	2	0.1	8	0.4	**2,266**	100.0
Total	**4,121**	97.4	**84**	2.0	**9**	0.2	**17**	0.4	**4,231**	100.0

3.2 Representativeness of Sample Population

TTo check whether the study population is representative of the Nepalese population aged 50 years and older, the age and sex composition of the sample were compared with that of the broader population of Koshi 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 wom-en aged 70 – 79 years in the study population were over represented, and men and women younger than 60 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						
	Male		Female		Total	
Age Group	n	%	n	%	n	%
50-59	757	39.8	940	42.3	1,697	41.2
60-69	627	33.0	728	32.8	1,355	32.9
70-79	364	19.2	401	18.1	765	18.6
80 above	152	8.0	152	6.8	304	7.4
Total	1,900	100.0	2,221	100.0	4,121	100.0
Age and Sex Composition of the Province						
50-59	175,733	47.2	174,565	47.0	350,298	47.1
60-69	117,145	31.5	116,821	31.5	233,966	31.5
70-79	58,731	15.8	57,182	15.4	115,913	15.6
80 above	20,642	5.5	22,510	6.1	43,152	5.8
Total	372,251	100.0	371,078	100.0	743,329	100.0

3.3 Crude Prevalence of Blindness and Visual Impairment

The crude prevalence of blindness with available correction was 1.0% (0.7 - 1.3). The crude prevalence of severe vision impairment (SVI), moderate vision impairment (MVI) and early vision impairment (EVI) were 1.4% (1.0 - 1.8), 5.8% (5.0 - 6.7) and 8.2% (7.2 - 9.2) respectively. The crude prevalence of functional low

vision (FLV) was 0.7% (0.4 - 0.9) (Table 3).

Table 3: Crude Prevalence of Blindness and Vision Impairment

Vision Category	Male, %(95% CI)	Female , %(95% CI)	All , %(95% CI)
Blindness	1.0 (0.5 - 1.4)	1.0 (0.5 - 1.5)	1.0 (0.7 - 1.3)
SVI	1.2 (0.6 - 1.8)	1.6 (1.1 - 2.2)	1.4 (1.0 - 1.8)
MVI	5.5 (4.4 - 6.6)	6.1 (5.0 - 7.3)	5.8 (5.0 - 6.7)
EVI	7.4 (6.2 - 8.5)	8.9 (7.5 - 10.3)	8.2 (7.2 - 9.2)
FLV	0.6 (0.3 - 0.9)	0.8 (0.4 - 1.2)	0.7 (0.4 - 0.9)

3.4 Prevalence of Blindness According to Age Group

The prevalence of blindness among survey participants aged 50 years and above was 1.0%(95%CI 0.7 - 1.3) and increased with age. The prevalence of bilateral blindness was found maximum 6.3%(95%CI 3.5-9.0) 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	1	0.1	0.0 - 0.4	1	0.1	0.0 - 0.3	2	0.1	0.0 - 0.3
60 – 69	5	0.8	0.0 - 1.6	3	0.4	0.0 - 0.9	8	0.6	0.1 - 1.0
70 – 79	5	1.4	0.2 - 2.5	6	1.5	0.3 - 2.7	11	1.4	0.6 - 2.2

80 above	7	4.6	1.5 - 7.7	12	7.9	3.4 - 12.4	19	6.3	3.5 - 9.0
Total	18	1.0	0.5 - 1.4	22	1.0	0.5 - 1.5	40	1.0	0.7 - 1.3

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 0.8% (95%CI 0.5 – 1.1). The age- and sex-adjusted prevalence of SVI, MVI, and EVI were 1.2% (95%CI 0.8-1.6), 5.1% (95%CI 4.3 – 6.0) and 7.5% (95%CI 6.5 – 8.4) respectively. The age- and sex-adjusted prevalence of FLV was 0.6% (95%CI 0.3- 0.9) (Table 5).

Based on the observed prevalence, an estimated 6,224 people aged 50 and older (2,924 men and 3,300 women) were found to be bilaterally blind in Koshi Province. A total of 109,094 people aged 50 and older (48,180 men and 60,914 women) were estimated to have vision impairment (PVA<6/12) including blindness. An estimated 4,440 people aged 50 and older (1,839 men and 2,601 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 45,017 in this province. A total of 325,117 eyes were found to have vision impairment including blindness (Table 5).

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

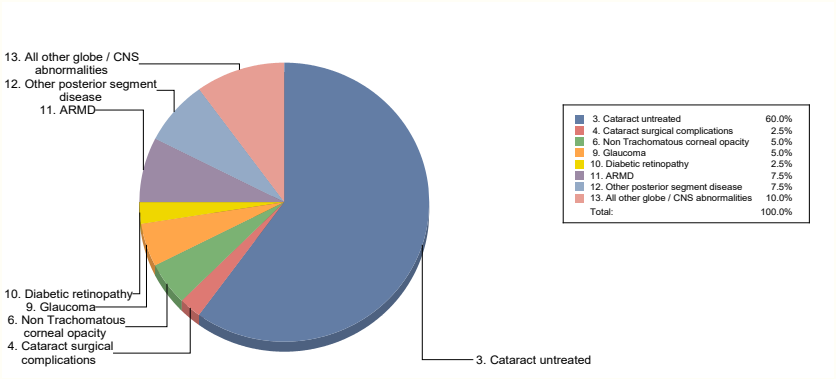
Age and Sex Adjusted Prevalence for All Causes of Blindness and VI - Persons									
PVA Category	Male			Female			All		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
Blindness	2,924	0.8	(0.4 - 1.2)	3,300	0.9	(0.4 - 1.4)	6,224	0.8	(0.5 - 1.1)
SVI	3,781	1.0	(0.4 - 1.6)	5,382	1.5	(0.9 - 2.0)	9,163	1.2	(0.8 - 1.6)
MVI	17,282	4.6	(3.5 - 5.7)	20,839	5.6	(4.5 - 6.8)	38,121	5.1	(4.3 - 6.0)
EVI	24,193	6.5	(5.4 - 7.6)	31,393	8.5	(7.0 - 9.9)	55,586	7.5	(6.5 - 8.4)
FLV	1,839	0.5	(0.2 - 0.8)	2,601	0.7	(0.3 - 1.1)	4,440	0.6	(0.3 - 0.9)
Age and Sex Adjusted Prevalence for All Causes of Blindness and VI – Eyes									
Blindness	21,744	2.9	(2.3 - 3.6)	23,273	3.1	(2.4 - 3.8)	45,017	3.0	(2.5 - 3.5)
SVI	13,156	1.8	(1.1 - 2.4)	17,344	2.3	(1.7 - 3.0)	30,500	2.1	(1.6 - 2.6)
MVI	50,400	6.8	(5.6 - 8.0)	58,235	7.8	(6.8 - 8.9)	108,635	7.3	(6.5 - 8.2)
EVI	65,475	8.8	(7.6 -10.0)	75,490	10.2	(8.8 - 11.5)	140,965	9.5	(8.5 - 10.5)

3.6 Causes of Blindness and VI in the Study Population

The main cause of bilateral blindness was untreated cataract (60.0%). The other causes were Globe/CNS abnormalities (10.0%), other posterior segment diseases (7.5%), ARMD (7.5%), glaucoma (5.0%), non-trachomatous CO (5.0%) and diabetic retinopathy (2.5%)

(Fig 1).

Figure 1: Causes of Blindness



Cataract was still the leading cause of SVI (86.4%) and MVI (78.3%). Uncorrected refractive error was the leading cause of EVI (57.7%) (Table 6).

The proportion of blindness due to glaucoma was 5.0%. 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.

Three-fourths of all blindness (75.0%) in the study population was avoidable. Specifically, 60.0% of blindness was treatable, 10.0% was preventable through more advanced ophthalmic services and 5.0% was preventable with primary health care and/ or primary eye care. Posterior segment disease accounted for 22.5% of all bilateral blindness (Table 6).

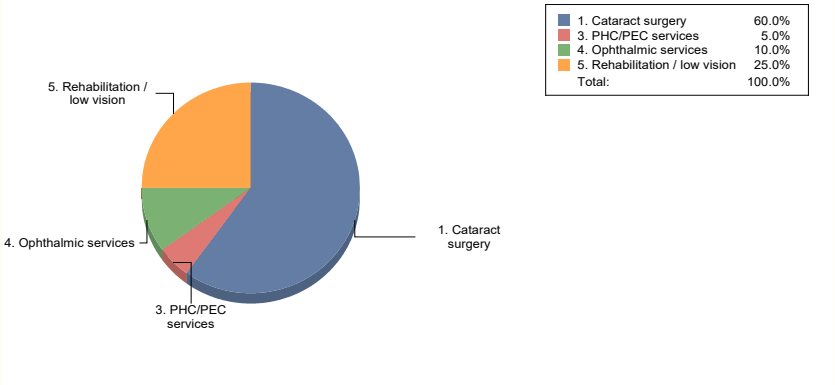
Table 6: Causes of Blindness and VI in Sample Population

Category	Blindness		SVI		MVI		EVI	
	n	%	n	%	n	%	n	%
By cause								
Cataract untreated	24	60.0	51	86.4	188	78.3	112	33.1
Non-trachomatous corneal opacity	2	5.0	0	0.0	2	0.8	1	0.3
Glaucoma	2	5.0	1	1.7	1	0.4	1	0.3
Diabetic retinopathy	1	2.5	1	1.7	1	0.4	5	1.5
Aphakia uncorrected	0	0.0	0	0.0	0	0.0	0	0.0
Cataract surgical complications	1	2.5	1	1.7	12	5.0	13	3.8
Trachomatous corneal opacity	0	0.0	0	0.0	0	0.0	2	0.6
Refractive error	0	0.0	0	0.0	26	10.8	195	57.7
Phthisis	0	0.0	0	0.0	2	0.0	0	0.0
ARMD	3	7.5	0	0.0	3	1.3	2	0.6
Other posterior segment diseases	3	7.5	3	5.1	4	1.7	2	0.6
Globe/CNS abnormalities	4	10.0	2	3.4	0	0.0	4	1.2
Total	40	100.0	59	100.0	240	100.0	338	100.0
By intervention category								
A. Treatable	24	60.0	51	86.4	214	89.2	307	90.8
B. Preventable (PHC/PEC services)	2	5.0	0	0.0	5	2.1	4	1.2
C. Preventable (Ophthalmic services)	4	10.0	3	5.1	14	5.8	19	5.6
D. Avoidable (A+B+C)	30	75.0	54	91.5	233	97.1	330	97.6
E. Posterior segment causes	9	22.5	5	8.5	10	4.2	11	3.3

The main intervention strategies to reduce avoidable blindness in Koshi Province are shown in Figure 2. 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 controland timely intervention, targeted health education and the development of specialist ophthalmic services might contribute to reducing avoidable blindness and vision impairment further.

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 0.5% (95% CI 0.3-0.7). The crude prevalence of eyes that are blind from cataract was 1.8% (95%CI 1.4-2.1)(Table 7).

The crude prevalence of SVI due to bilateral cataract was 1.4% (95%CI 1.0-1.7). The crude prevalence of eyes affected by SVI due to cataract was 3.1% (95%CI 2.6-3.7) (Table 7).

The crude prevalence of MVI due to bilateral cataract was 4.4% (95%CI 3.6-5.2). The crude prevalence of eyes that are affected by MVI due to cataract was 7.5% (95%CI 6.5-8.5) (Table 7).

The crude prevalence of EVI due to bilateral cataract was 7.7%

(95%CI 6.8-8.7). The crude prevalence of eyes that are affected by EVI due to cataract was 12.1% (95%CI 10.8-13.4) (Table 7).

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

	Male			Female			Total		
	n	%	95%CI	n	%	95%CI	n	%	95%CI
Cataract causing blindness									
Bilateral cataract	12	0.6	0.3-1.0	9	0.4	0.1-0.7	21	0.5	0.3-0.7
Unilateral cataract	47	2.5	1.8-3.2	55	2.5	1.7-3.2	102	2.5	1.9-3.0
Cataract eyes	71	1.9	1.4-2.4	73	1.6	1.1-2.1	144	1.8	1.4-2.1
Cataract causing SVI									
Bilateral cataract	24	1.3	0.7-1.8	32	1.4	0.9-1.9	56	1.4	1.0-1.7
Unilateral cataract	68	3.6	2.8-4.6	78	3.5	3.6-5.9	146	3.5	3.5-5.1
Cataract eyes	116	3.1	2.3-3.8	142	3.2	2.5-3.9	258	3.1	2.6-3.7
Cataract causing MVI									
Bilateral cataract	82	4.3	3.2-5.4	98	4.4	3.4-5.4	180	4.4	3.6-5.2
Unilateral cataract	117	6.2	4.8-7.5	143	6.4	5.1-7.8	260	6.3	5.2-7.4
Cataract eyes	281	7.4	6.1-8.7	339	7.6	6.4-8.8	620	7.5	6.5-8.5
Cataract causing EVI									
Bilateral cataract	143	7.5	6.2-8.9	176	7.9	6.7-9.1	319	7.7	6.8-8.7
Unilateral cataract	157	8.3	6.8-9.8	202	9.1	7.7-10.5	359	8.7	7.5-9.9
Cataract eyes	443	11.7	10.1-13.2	554	12.5	11.0-13.9	997	12.1	10.8-13.4

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 0.4% (95%CI: 0.2-0.7). We therefore estimated that that 3,238 people

(1,910 men and 1,328 women) aged 50 years and older are blind due to cataract in Koshi Province. The age- and sex-adjusted prevalence of eyes that are blind from cataract was 1.5% (95%CI 1.2-1.9) with an estimated 22,865 eyes blind due to cataract among people aged 50 years and older in Province 1 of Nepal (Table 8). The age- and sex-adjusted prevalence of SVI due to bilateral cataract was 0.7% (95%CI 0.4-1.0) corresponding to an estimated 5,351 people aged 50 years and older in Koshi Province. The age and sex adjusted prevalence of eyes affected by SVI due to cataract was 1.2% (95%CI 0.8-1.6) corresponding to an estimated 18,048 affected eyes in the province (Table 8).

The age- and sex-adjusted prevalence of MVI due to bilateral cataract was 2.6% (95%CI 2.0-3.3) corresponding to an estimated 19,396 people aged 50 years and older in Koshi Province. We also estimated that 57,138 eyes (prevalence 3.8%) are affected by MVI due to cataract (Table 8).

The age- and sex-adjusted prevalence of EVI due to bilateral cataract was 1.5% (95%CI 0.8-2.2) corresponding to an estimated 22,251 people aged 50 years and older in Koshi Province. We also estimated that 60,891 eyes (prevalence 4.1%) 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 50,236 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 158,942 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
Blindness	1,910	0.5	0.1 - 0.9	1,328	0.4	0.1 - 0.6	3,238	0.4	0.2 - 0.7
SVI	1,986	0.5	0.1 - 1.0	3,365	0.9	0.5 - 1.3	5,351	0.7	0.4 - 1.0
MVI	9,391	2.5	1.6 - 3.4	10,005	2.7	1.9 - 3.5	19,396	2.6	2.0 - 3.3
EVI	10,048	1.4	0.6 - 2.1	12,203	1.6	0.7 - 2.5	22,251	1.5	0.8 - 2.2
Cataract Causing Blindness and VI in eyes									
Blindness	11,783	1.6	1.1 - 2.1	11,082	1.5	1.0 - 2.0	22,865	1.5	1.2 - 1.9
SVI	7,692	1.0	0.5 - 1.5	10,356	1.4	0.9 - 1.9	18,048	1.2	0.8 - 1.6
MVI	27,113	3.6	2.6 - 4.7	30,025	4.0	3.2 - 4.9	57,138	3.8	3.1 - 4.5
EVI	27,223	3.7	2.9 - 4.4	33,668	4.5	3.8 - 5.3	60,891	4.1	3.5 - 4.7

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 cover- age of cataract surgical services.

At 93.5%, the age- and sex-adjusted CSC among people who are blind (PVA<3/60) is higher than the target of at least 85% recom- mended by the International Agency for the Prevention of Blind- ness (IAPB). The age- and sex-adjusted CSC was slightly lower in men (92.1%) compared with women (94.8%) (Table 9). The age- and sex-adjusted CSC among people at a VA of <6/60

and <6/18 are 85.2% and 67.3%, 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 84.7%, with slightly lower coverage in men (83.0%) than in women (86.0%) (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 84.0%. The eCSC among people with VA of <6/60 and <6/18 are 75.7% and 58.4%, respectively (Table 9).

Table 9: Cataract Surgical Coverage

Vision Category	Male	Female	Total
Cataract Surgical Coverage (Persons) – percentages			
VA <3/60	92.1	94.8	93.5
VA <6/60	86.0	84.6	85.2
VA <6/18	66.9	67.7	67.3
Cataract Surgical Coverage (Eyes) – percentages			
VA <3/60	83.3	85.9	84.7
VA <6/60	75.3	75.8	75.6
VA <6/18	55.8	56.8	56.3
Effective Cataract Surgical Coverage (persons)- percentages			

VA <3/60	84.1	83.9	84.0
VA <6/60	77.2	74.5	75.7
VA <6/18	58.9	58.1	58.4

3.10 Visual Outcome of Cataract Surgery

In this survey 799 eyes had cataract surgery, 788 (98.6%) eyes had an intraocular lens (IOL) implanted and 11(1.4%) eyes did not have an IOL. Overall good visual outcome by WHO definition was seen in 81.4% (PVA ≥6/18) and 86.2% (BCVA ≥6/18) of the cataract operated eyes. Overall poor outcome was seen in 7.0% (PVA<6/60) and 6.3% (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 3).

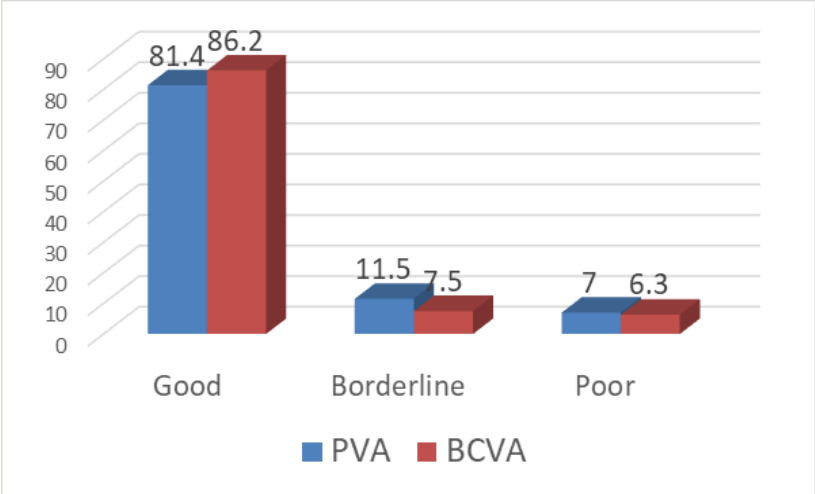
Table 10: Visual Outcome of Cataract Surgery in the Study Population

Visual outcome	VA Type	Non-IOL		IOL		Total	
		n	%	n	%	n	%
Very good ≥ 6/12	PVA	2	18.2	536	68.0	538	67.3
	BCVA	2	18.2	620	78.7	622	77.8
Good: ≥ 6/18	PVA	0	0.0	113	14.3	113	14.1
	BCVA	0	0.0	67	8.5	67	8.4
Borderline: <6/18 - 6/60	PVA	4	36.4	88	11.2	92	11.5
	BCVA	4	36.4	56	7.1	60	7.5

Poor: < 6/60	PVA	5	45.5	51	6.5	56	7.0
	BCVA	5	45.5	45	5.7	50	6.3

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

Fig 3 Visual outcome of cataract surgery in the study population



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 are up three years postop (88.1%) and lowest among those who are seven years or more postop (74.3%) (Table 11).

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

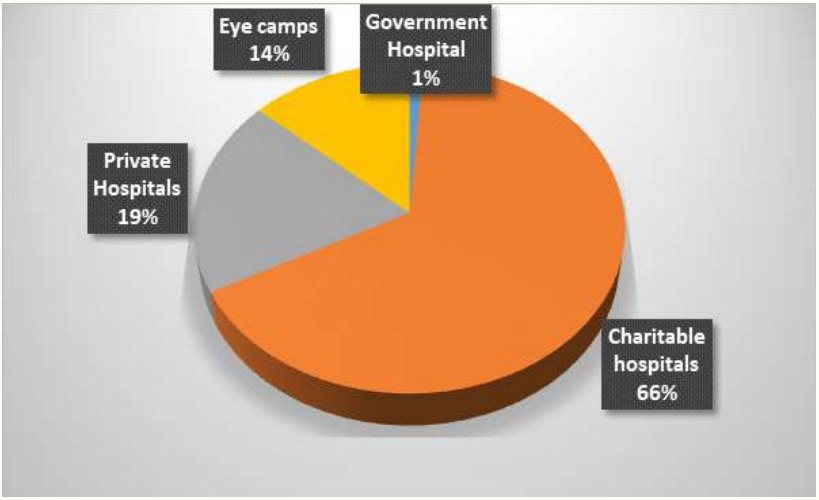
Visual Outcome in Cataract Operated Eyes by years after surgery (n=1,157)								
Category PVA	0-3 years		4-6 years		7+ years		Total	
	n	%	n	%	n	%	n	%

Very Good ≥6/12	229	73.9	156	68.4	153	58.6	538	67.3
Good : ≥6/18	44	14.2	28	12.3	41	15.7	113	14.1
Borderline :<6/18 - 6/60	22	7.1	26	11.4	44	16.9	92	11.5
Poor : < 6/60	15	4.8	18	7.9	23	8.8	56	7.0
Total	310	100.0	228	100.0	261	100.0	799	100.0

3.12 Proportion of Cataract Surgery According to Place of Surgery

Most patients were operated upon in charitable eye hospitals (66.0%), whilst others received surgery in private eye hospitals (19.0%), in eye camps (14.0%), and government hospitals (1.0%) (Fig 4).

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 (88.9%) followed by Chari-

table hospitals (83.0%), private hospitals (79.2%) and eye camps (76.6%) 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 : ≥6/12	8	88.9	368	69.6	97	63.0	65	60.7	538	67.3
Good : ≥6/18	0	0.0	71	13.4	25	16.2	17	15.9	113	14.1
Borderline : <6/18-6/60	1	11.1	59	11.2	14	9.1	18	16.8	92	11.5
Poor : < 6/60	0	0.0	31	5.9	18	11.7	7	6.5	56	7.0
Total	9	100.0	529	100.0	154	100.0	107	100.0	799	100.0

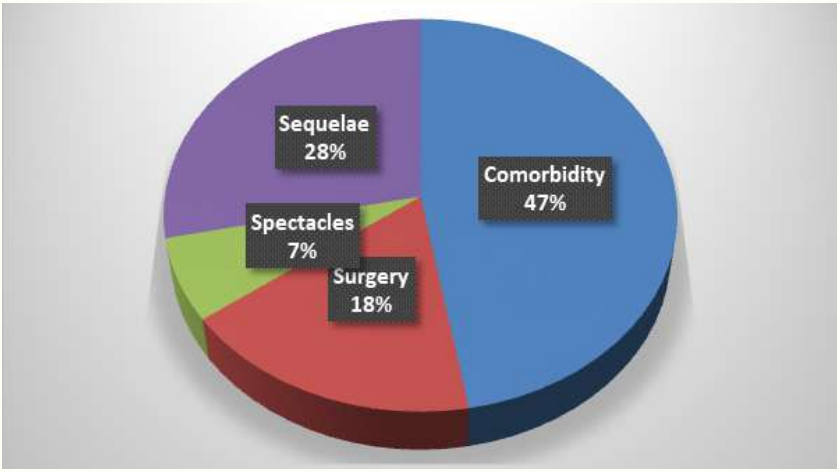
The main causes of poor visual outcomes following cataract surgery were Comorbidity (47.3%), long term surgical complications (28.4%), immediate surgical complication (17.6%) and other causes were spectacles (6.8%) (Table 14).

Table 14: Causes of Poor Outcome among Cataract Operated Eyes

Causes	Borderline Outcome		Poor Outcome		Total	
	n	%	n	%	n	%
Comorbidity	26	28.3	44	78.6	70	47.3
Surgery	19	20.7	7	12.5	26	17.6

Spectacles	10	10.9	0	0.0	10	6.8
Sequelae	37	40.2	5	8.9	42	28.4
Total	92	100.0	56	100.0	148	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 cost (28.8%), local reason (23.3%), lack of felt need (21.9%), Fear of surgery (9.6%) and Can't access treatment (9.6%) (Table 15).

Table 15: Barriers to Uptake Cataract Surgical Services

Barriers	Men		Women		Total	
	n	%	n	%	n	%
Need not felt	9	29.0	7	16.7	16	21.9
Fear	3	9.7	4	9.5	7	9.6

Cost	10	32.3	11	26.2	21	28.8
Treatment denied by provider	1	3.2	1	2.4	2	2.7
Unaware treatment is possible	2	6.5	1	2.4	3	4.1
Cannot access treatment	1	3.2	6	14.3	7	9.6
Local reason	5	16.1	12	28.6	17	23.3
Total	31	100.0	42	100.0	73	100.0

3.14 Refractive Error in People Aged 50 Years and Older

The prevalence of refractive error was 15.7% among the people 50 years and older. Among those, 5.4% of people aged 50 years and older who had a refractive error did not have glasses. On the other hand, 80.0% 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 (84.3%) than men (75.0) 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 Errors	303	16.0	343	15.4	646	15.7
Uncorrected Refractive Errors	91	4.8	130	5.9	221	5.4
Uncorrected Presbyopia	1,425	75.0	1,872	84.3	3,297	80.0

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 Koshi Province was 0.6% (95%CI 0.3-0.9). 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-tra- chomatous corneal opacity. The other causes were diabetic reti- nopathy (8.7%), ARMD (17.9%) and other posterior segment dis- eases (28.6%) Table 17).

Table 17: Prevalence of Functional Low Vision

By Type	Male		Female		Total	
	n	%	n	%	n	%
Crude prevalence	11	0.6	17	0.8	**28**	**0.7**
Adjusted prevalence	1,839	0.5	2,601	0.7	4,442	0.6
By Cause						
Cataract surgical complications	1	9.1%	2	11.8%	**3**	**10.7%**
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	1	9.1%	4	23.5%	**5**	**17.9%**
Other posterior segment disease	5	45.5%	3	17.6%	**8**	**28.6%**
All other globe/CNS abnormalities	2	18.2%	3	17.6%	**5**	**17.9%**

Among the people with diabetes, 14.6% had any degree of reti-

nopathy 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 18).

Table 18: Prevalence of Diabetic Retinopathy

Retinopathy Grade	No	Among the Diabetic % (95% CI)		Full Sample % (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)
Any Retinopathy	**33**	**14.6**	**(8.7-20.5)**	**0.8**	**(0.5-1.1)**
Maculopathy grade					
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)

Any Maculopathy	**9**	**4.0**	**(1.2-6.8)**	**0.2**	**(0.1-0.4)**
Any retinopathy and/or Maculopathy	**34**	**15.0**	**(9.0-21.1)**	**0.8**	**(0.5-1.2)**
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)

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 Koshi 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 as cost, lack of felt need, fear of surgery, and cannot access treatment prevent 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 often not met yet as a goal to achieve Universal Eye Health Coverage.

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List of Clusters

Koshi Province			
Cluster No	**Code**	**Name of population unit**	**Population**
1	891509	Taplejung Dokhu 9	893
2	893207	Taplejung Nalbu 7	58
3	894205	Taplejung Phurumbu 5	293
4	895808	Taplejung Tiringe 8	182
5	901706	Panchthar Chyangthapu 6	165
6	902704	Panchthar Mauwa 4	454
7	903407	Panchthar Panchami 7	236
8	903907	Panchthar Prangbung 7	486
9	904702	Panchthar Syabrumba 2	577
10	911203	Ilam Barbote 3	1,096
11	911601	Ilam Danabari 1	3,116
12	912203	Ilam Ibhang 3	388
13	912701	Ilam Jitpur 1	1,207
14	913401	Ilam Mahamai 1	1,051
15	913907	Ilam Nayabazar 7	732
16	914405	Ilam Phuyatappa 5	317
17	915301	Ilam Shree Antu 1	524
18	921002	Jhapa Anarmani 2	4,313
19	921104	Jhapa Arjundhara 4	1,721
20	921301	Jhapa Baigundhura 1	478
21	921615	Jhapa Bhadrapur Municipality 15	1,044
22	921902	Jhapa Chandragadhi 2	1,302
23	922009	Jhapa Charpane 9	500
24	922110	Jhapa Damak Municipality 10	10,098
25	922119	Jhapa Damak Municipality 19	1,963
26	922503	Jhapa Duwagadhi 3	702
27	922704	Jhapa Gauradaha 4	2,353
28	923007	Jhapa Gherabari 7	940

29	923405	Jhapa Juropani 5	1,801
30	923804	Jhapa Khudunabari 4	1,401
31	924109	Jhapa Kumarkhod 9	368
32	924408	Jhapa Maharanijhoda 8	1,039
33	924605	Jhapa Mechinagar Municipality 5	3,364
34	924613	Jhapa Mechinagar Municipality 13	4,182
35	925006	Jhapa Prithvinagar 6	1,212
36	925206	Jhapa Sanischare 6	4,017
37	925309	Jhapa Satasidham 9	3,872
38	925603	Jhapa Shivaganj 3	725
39	925801	Jhapa Taghandubba 1	994
40	931005	Morang Amahibariyati 5	567
41	931309	Morang Babiya Birta 9	1,405
42	931709	Morang Baradanga 9	1,854
43	931904	Morang Belbari 4	5,438
44	932202	Morang Biratnagar Sub-Metropolitan City 2	5,151
45	932205	Morang Biratnagar Sub-Metropolitan City 5	15,312
46	932209	Morang Biratnagar Sub-Metropolitan City 9	2,211
47	932213	Morang Biratnagar Sub-Metropolitan City 13	12,658
48	932216	Morang Biratnagar Sub-Metropolitan City 16	15,789
49	932221	Morang Biratnagar Sub-Metropolitan City 21	5,063
50	932506	Morang Dainiya 6	812
51	932801	Morang Drabesh 1	2,083
52	933005	Morang Govindapur 5	1,465
53	933402	Morang Hoklabari 2	886
54	933602	Morang Itahara 2	2,462
55	934001	Morang Kadmaha 1	785
56	934207	Morang Katahari 7	2,831

57	934503	Morang Lakhantari 3	401
58	934705	Morang Madhumalla 5	2,512
59	935007	Morang Matigachha 7	2,151
60	935401	Morang Pathari 1	9,516
61	935809	Morang Ramite Khola 9	286
62	936007	Morang Sanischare 7	3,417
63	936602	Morang Sorabhag 2	1,263
64	936809	Morang Takuwa 9	1,131
65	937109	Morang Tetariya 9	1,053
66	937306	Morang Urlabari 6	6,015
67	941204	Sunasari Aurabani 4	219
68	941507	Sunasari Barahachhetra 7	733
69	941902	Sunasari Bharaul 2	1,340
70	942203	Sunasari Chandwela 3	245
71	942602	Sunasari Dharan Municipality 2	1,279
72	942610	Sunasari Dharan Municipality 10	5,365
73	942614	Sunasari Dharan Municipality 14	3,719
74	942618	Sunasari Dharan Municipality 18	7,037
75	942808	Sunasari Dumraha 8	1,516
76	943203	Sunasari Hansaposa 3	676
77	943502	Sunasari Inaruwa Municipality 2	2,886
78	943601	Sunasari Itahari Municipality 1	8,140
79	943604	Sunasari Itahari Municipality 4	16,077
80	943804	Sunasari Kaptanganj 4	840
81	944107	Sunasari Madhelee 7	910
82	944504	Sunasari Mahendranagar 4	8,912
83	944703	Sunasari Pakali 3	2,409
84	944909	Sunasari Pashchim Kushaha 9	1,761
85	945307	Sunasari Ramganj Belgachhiya 7	951
86	945803	Sunasari Singiya 3	913
87	946103	Sunasari Tanamuna 3	851
88	951708	Dhankuta Bodhe 8	259

89	952501	Dhankuta Dhankuta Municipality 1	8,420
90	953004	Dhankuta Kurule Tenupa 4	268
91	953903	Dhankuta Parewadin 3	347
92	961309	Terhathum Chhate Dhunga 9	539
93	962403	Terhathum Myanglung 3	352
94	963702	Terhathum Solma 2	161
95	971405	Sankhuwasabha Baneswor 5	492
96	972203	Sankhuwasabha Khandbari Municipality 3	2,940
97	972607	Sankhuwasabha Makalu 7	673
98	973704	Sankhuwasabha Siddhapokhari 4	333
99	981209	Bhojpur Baikunthe 9	256
100	982401	Bhojpur Chhinamakhu 1	324
101	983505	Bhojpur Helauchha 5	807
102	984703	Bhojpur Lekharka 3	278
103	985909	Bhojpur Sano Dumma 9	68
104	991009	Solukhumbu Baku 9	499
105	992303	Solukhumbu Jubing 3	368
106	993603	Solukhumbu Pawai 3	171
107	1001206	Okhaldhunga Balakhu 6	403
108	1002507	Okhaldhunga Harkapur 7	268
109	1004005	Okhaldhunga Mulkharka 5	171
110	1005305	Okhaldhunga Rumjatar 5	314
111	1011104	Khotang Arkhaule 4	244
112	1012308	Khotang Chhitapokhari 8	190
113	1013406	Khotang Dikuwa 6	410
114	1014804	Khotang Kharmi 4	228
115	1016301	Khotang Nerpa 1	148
116	1017705	Khotang Saunechaur 5	276
117	1021306	Udayapur Baraha 6	513
118	1021707	Udayapur Bhalayadanda 7	434
119	1022509	Udayapur Jante 9	317
120	1023001	Udayapur Laphagaun 1	399

121	1023909	Udayapur Pokhari 9	200
122	1024608	Udayapur Sirise 8	576
123	1025205	Udayapur Thoksila 5	933
124	1025401	Udayapur Triyuga Municipality 1	7,085
125	1025410	Udayapur Triyuga Municipality 10	2,022

नेपाल नेत्रज्योति संघ

त्रिपुरेश्वर, काठमाडौं

"RAPID ASSESSMENT OF AVOIDABLE BLINDNESS सम्बन्धि सर्वेक्षण २०१८"

प्रदेश नं. १

सुसूचित सम्मुतीनामा पत्र

आदरणीय सहभागी.....

पृष्ठभूमी र उद्धेश्य

नेपाल नेत्रज्योति संघ, नेपालमा आँखा स्वास्थ्य सेवाको क्षेत्रमा कामगर्ने एउटा नुनाफा रहित गैर सरकारी स्वास्थ्य संस्था हो । यस संस्थाले झापदेखी १८ वटा आँखा अस्पताल तथा ८० वटा आँखा उपचार केन्द्रको सञ्चालनार्थात नेपालमा आँखा सम्बन्धी जनचेतना एवम् सूचनाप्रवाह तथा देशमा कुल आँखा स्वास्थ्य सेवाको ९०% सेवाजनसमक्ष पुऱ्याउँदै आइरहेको छ । यसै वर्ष यस संस्थाले आई केयर फाउण्डेशन र CBM को सहयोगमा नेपालको प्रदेश नं १ मा "RAPID ASSESSMENT OF AVOIDABLE BLINDNESS सम्बन्धि सर्वेक्षण २०१८" सञ्चालन गरिरहेको छ । नेपालको प्रदेश नं १ मा अन्धोपन तथा आँखा सम्बन्धि समस्याहरुको अवस्था एवं समस्याका मुख्य कारणहरु पत्ता लगाउनु यस सर्वेक्षण कार्यको प्रमुख उद्धेश्य हो । यस सर्वेक्षण कार्यको लागि नेपाल स्वास्थ्य अनुसन्धान परिषद्, ERB बाट स्वीकृतिप्राप्त भएको छ । यो सर्वेक्षण नेपाल नेत्रज्योति संघ अर्न्तगतका यसै प्रदेशमा सेवारत आँखा अस्पतालका तालिमप्राप्त नेत्र चिकित्सक, नेत्र सहायक एवं नेत्र स्वास्थ्य कार्यकर्ता/ तथ्याङ्क संकलकद्वारा सञ्चालन गरिनेछ ।

सहभागीको भूमिका

यस अध्ययनमा तपाईलाई सोधिएको प्रश्नको जवाफ निर्धक्क भई इमान्दारीका साथ यस सर्वेक्षण कार्यमा सहभागी हुनुहुन अनुरोध छ ।

फाइदा र जोखिम

यस सर्वेक्षणमा तपाईंले दिनुभएको प्रतिक्रिया एवं सहभागिताले आँखा स्वास्थ्य सेवा संचालन तथा यस सम्बन्धि सेवा सम्पूर्ण आँखा अस्पतालहरुमा विस्तार गर्न, आँखा स्वास्थ्य सेवाको प्रभावकारिता बढाउन, समसामयिकुल रणनीति तयार गर्न सहयोग पुग्नेछ । यस सर्वेक्षणमा सहभागी भएकोमा तपाईलाई कुनैपनि किसिमको जोखिम नहुने साथै कुनैपनि किसिमको प्रत्यक्षलाभ (नगद तथा जिन्सी समान प्रदान नगरिने) नहुने कुरामा विश्वास दिलाउन चाहन्छु । तर यदी तपाईको आँखामा कुनैपनि किसिमको समस्या देखिएको खण्डमा तपाईलाई निशुल्क उपचारको लागी सम्बन्धित अस्पतालमा तुरुन्त रिफर गरिने छ ।

गोपनीयता

तपाईले दिएका तथ्याङ्कहरु गोप्यताका साथ वा राष्ट्रिय महत्वको अन्य अनुसन्धानमा प्रयोग गरिनेछ । तपाईको नाम, ठेगाना तथा अन्य व्यक्तिगत विवरणहरु कुनै पनि प्रतिवेदन वा संचार माध्यममा उल्लेख नगरी परिचयात्मक कोडको मात्र प्रयोग गरिनेछ ।

सहभागिता

यस सर्वेक्षणमा तपाईको सहभागिता स्वेच्छिक हुनेछ । करिब २० मिनेटको यस अन्तरवार्ता एवं सामान्य आँखा जाँच तथा दृष्टि परिक्षणमा ५० वा सो भन्दा माथिको आमा बुवाहरुलाई मात्र सहभागी गराइने छ । तपाईले सम्पूर्ण प्रश्नहरुको उत्तर दिनुका साथै आँखा जाँच कार्यमा सहकार्य गर्नु हुनेछ भन्ने अपेक्षा गर्दछौं । तर तपाईले चाहेको खण्डमा यहाँलाई चित्त नबुझेका प्रश्नको जवाफ नदिनु वा कुनैपनि बेला यस सर्वेक्षणबाट अलगिन सक्नुहुनेछ । यसरी अलगिनु भयो भने पनि तपाईलाई कुनै हानी नोक्सानी हुनेछैन, तपाईले कुनै हर्जाना पनि तिर्नुपर्ने छैन । तपाईलाई यस सर्वेक्षणको बारेमा कुनैपनि कुराको जिज्ञासा भएमा जुनसुकै बेलामा पनि सर्वेक्षण टोलीलाई सम्पर्क राख्न सक्नुहुनेछ । अनुसन्धानको सम्बन्धमा थप जानकारीका लागि नेपाल नेत्रज्योति संघ, त्रिपुरेश्वर काठमाडौं, टेलिफोन नं ०१-४२६१९८३ मा सम्पर्क राख्न सक्नुहुनेछ ।

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सुसूचित सम्मुतीनामा पत्र सहभागीको परिचय कोड: ☐

हामीले तपाईलाई यस सर्वेक्षणको उद्धेश्य र आधार, अन्तरवार्ता प्रक्रिया, यहाँको भूमिका, सम्भावित जोखिम र फाईदा तथा गोपनीयताका बारेमा पूर्ण जानकारी दिएका छौं । तपाई आफ्नो स्वेच्छाले कुनै पनि बेला यो सर्वेक्षण कार्यबाट अलग हुन सक्ने कुराको बारेमा पनि जानकारी गराएका छौं ।

के तपाई यस सर्वेक्षण कार्यमा सहभागी हुन तयार हुनुहुन्छ ?

तयार छु, ☐ सहभागीको हस्ताक्षर..... अन्तरवार्ता लिनेको हस्ताक्षर.....

तयार छैन, ☐ मिति : ..... मिति : .....

Government of Nepal

Nepal Health Research Council (NHRC)

Estd. 1991

Ref. No.: 3254

18 June 2019

Mr. Sailesh Kumar Mishra
Principal Investigator
Nepal Netra Jyoti Sangh
Kathmandu

Ref: **Approval of research proposal** entitled **Rapid assessment of avoidable blindness (RAAB) survey in province one, Nepal**

Dear Mr. Mishra,

It is my pleasure to inform you that the above-mentioned proposal submitted on **15 May 2019 (Reg. no. 303/2019)** please use this Reg. No. during further correspondence) has been approved by Nepal Health Research Council (NHRC) Ethical Review Board on **5 June 2019**.

As per NHRC rules and regulations, the investigator has to strictly follow the protocol stipulated in the proposa . Any change in objective(s), problem statement, research question or hypothesis, methodology, implementation procedure, data management and budget that may be necessary in course of the implementation of the research proposal can only be made so and implemented after prior approval from this council. Thus, it is compulsory to submit the detail of such changes intended or desired with justification prior to actual change in the protocol. Expiration date of this proposal is **September 2019.**

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 labs outside of Nepal for further 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, the process documented, and the NHRC informed.

Further, the researchers are directed to strictly abide by the National Ethical Guidelines published by NHRC during the implementation of their project proposal and **submit progress report in between and full or summary report upon completion**.

As per your research proposal, the total research amount is **Rs 22,38,425** and accordingly the processing fee amounts to **Rs 67,152.75** It is acknowledged that the above-mentioned processing fee has been received at NHRC

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

Thanking you,

Prof. Dr. Anjani Kumar Jha
Executive Chairperson

Tel: +977 1 4254220, Fax: +977 1 4262469, Ramshah Path, PO Box: 7626, Kathmandu, Nepal
Website: http://www.nhrc.gov.np, E-mail: nhrc@nhrc.gov.np

नेपाल सरकार
स्वास्थ्य तथा जनसंख्या मन्त्रालय
स्वास्थ्य सेवा विभाग
(कर्मचारी प्रशासन शाखा)

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प.सं.आ.प्र ०७४/०७५
चलानी नं- 8036

मिति: २०७५।०३।२१

विषय: आवश्यक सहयोग सम्वन्धमा ।

श्री ७७ जिल्ला स्वास्थ्य/जनस्वास्थ्य कार्यालय र
सबै पालिका स्वास्थ्य शाखा ।

प्रस्तुत विषयमा नेपाल नेत्रज्योति संघको प.सं. ०७४/७५ च.नं. ३३६ मिति २०७५।०३।२१ को पत्रानुसार आँखा स्वास्थ्य सेवाको प्रभावकारीता बढाउदै समयानुकूल रणनीति तयार पारी Vision 2020 : The Right to Sight को उद्देश्य परिपूर्तिका लागि नेपाल नेत्रज्योति संघ र विभिन्न दातृ निकायहरुको सहकार्यमा जुलाई, २०१८ देखि क्रमिक रुपमा सबै जिल्लाहरुमा RAAB Survey 2018 सञ्चालन हुने भएको हुँदा तहाँ जिल्ला स्वास्थ्य/जनस्वास्थ्य कार्यालय तथा पालिका स्वास्थ्य शाखाबाट नियमानुसार आवश्यक सहयोग गरिदिनुहुन निर्णयानुसार अनुरोध छ ।

.....
(दीपक रिजाल)
शाखा अधिकृत

"निजामती कर्मचारीको प्रतिबध्दता : पारदर्शीता र चुस्तता"

Photo Glimpse







Biratanagar Eye Hospital

Mechi Eye Hospital

SCEH Lahan

RP Pokharel Eye Hospital

Ending Avoidable Sight Loss

2030 IN SIGHT