

The Cost to Close the Gap for Vision



THE UNIVERSITY OF
MELBOURNE

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We acknowledge and thank community members, colleagues and stakeholders who have been consulted and participated in the development of this report and in particular the support from Greg Poche AO.

Published by the Indigenous Eye Health Unit, Melbourne School of Population Health, The University of Melbourne, Victoria, Australia
ISBN 978-0-7340-4737-3

August 2011

Supported by the Harold Mitchell Foundation, The Ian Potter Foundation, Greg Poche AO and The University of Melbourne

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Executive Summary

To **Close the Gap for Vision** for Indigenous Australians should be one of the national goals of Australia. Eye health is the equal third leading cause of health gap between Indigenous and non-Indigenous Australians. However, 94% of the blindness and poor vision of Indigenous Australians can be avoided or treated. The outcome of eye disease treatment is generally immediate and has high certainty. As a result, eye health care has been considered as one of the most cost-effective interventions to Indigenous Australians' health and the investment required to **Close the Gap for Vision** for Indigenous Australians is highly achievable. This study aims to estimate the extra resources required to **Close the Gap for Vision** for Indigenous Australians within 5 years.

This study has employed a comprehensive costing model which captures all direct medical and non-medical costs (such as support for travel and accommodation to the patients and support for co-ordination workforce within the eye health care system) to provide needed eye care services to all Indigenous Australians, focusing on three major eye health problems, namely cataract, refractive error and diabetic retinopathy. However, it does not include costs for governance or infrastructure. Estimations of providing eye care that deal with Indigenous Australians' cataract surgery, refractive error and diabetic retinopathy are summarised as the following (all in 2011 Australian dollars):

- > Total cost: \$45 million a year.
- > Current spending: \$18 million a year.
- > Added cost to **Close the Gap for Vision**: \$28 million a year, or \$140 million over 5 years.
- > 46% of the additional cost is for implementing the necessary co-ordination workforce within the eye health care system.

However, because of the limitations in the available data for co-ordination costs, we cannot clearly separate the relative contributions of the Commonwealth and jurisdictional Governments, the expenditure in each jurisdiction or the relative contributions to the co-ordination costs.

This study also provides indicative information regarding the costs required to **Close the Gap for Vision** for Indigenous Australians for each State and Territory in Australia.

Executive Summary Table 1: Annual Costs by Uncapped Commonwealth, Uncapped State, Capped and Co-ordination Costs; and also by Current, Additional and Total Costs

	Commonwealth		Co-ordination Cost	State/ Territory		Total
	Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
CURRENT	\$4,759,837	\$991,102	\$8,012,408	\$1,682,982	\$1,958,089	\$17,404,418
ADDITIONAL	\$5,109,859	\$2,910,654	\$13,324,604	\$4,710,672	\$2,007,014	\$28,062,803
TOTAL	\$9,869,696	\$3,901,756	\$21,337,012	\$6,393,654	\$3,965,103	\$45,467,221
5 YEAR ADDITIONAL	\$25,549,295	\$14,553,270	\$66,623,018	\$23,553,362	\$10,035,070	\$140,314,015
5 YEAR TOTAL	\$49,348,480	\$19,508,780	\$106,685,058	\$31,968,270	\$19,825,515	\$227,336,103

Executive Summary Table 2: Annual Costs by Condition; Uncapped Commonwealth, Uncapped State, Capped and Co-ordination Costs; and also by Current, Additional and Total Costs

	Commonwealth		Co-ordination Cost	State/ Territory		Total
	Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
CURRENT						Current Cost
Cataract	\$747,199	\$457,912	\$1,087,734	\$1,650,463	\$182,410	\$4,125,718
Refractive Error	\$2,363,844	\$284,920	\$4,691,117	\$0	\$1,712,483	\$9,052,364
Diabetes	\$1,648,794	\$248,270	\$2,233,557	\$32,519	\$63,196	\$4,226,335
Total	\$4,759,837	\$991,102	\$8,012,408	\$1,682,982	\$1,958,089	\$17,404,418
ADDITIONAL						Total Additional Cost
Cataract	\$1,833,799	\$1,188,405	\$2,904,268	\$4,400,173	\$487,200	\$10,813,845
Refractive Error	\$167,374	\$44,768	\$2,430,114	\$0	\$878,972	\$3,521,228
Diabetes	\$3,108,686	\$1,677,481	\$7,990,222	\$310,499	\$640,842	\$13,727,730
Total	\$5,109,859	\$2,910,654	\$13,324,604	\$4,710,672	\$2,007,014	\$28,062,803
TOTAL						1 Year Total Cost
Cataract	\$2,580,998	\$1,646,317	\$3,992,002	\$6,050,636	\$669,610	\$14,939,563
Refractive Error	\$2,531,218	\$329,688	\$7,121,231	\$0	\$2,591,455	\$12,573,592
Diabetes	\$4,757,480	\$1,925,751	\$10,223,778	\$343,018	\$704,038	\$17,954,065
Total	\$9,869,696	\$3,901,756	\$21,337,012	\$6,393,654	\$3,965,103	\$45,467,221
5 YEAR ADDITIONAL	\$25,549,295	\$14,553,270	\$66,623,018	\$23,553,362	\$10,035,070	\$140,314,015
5 YEAR TOTAL	\$49,348,480	\$19,508,780	\$106,685,058	\$31,968,270	\$19,825,515	\$227,336,103

Introduction

1. Motivation

Australia has a stated objective to Close the Gap for Health for Indigenous Australians (1, 2) and this should also include to **Close the Gap for Vision**. Eye health is the equal third leading cause of the health gap for Indigenous Australians (3, 4). Compared with non-Indigenous Australians, Indigenous children have better vision. However, Indigenous Australians aged 40 and above have 6 times the rate of blindness of non-Indigenous Australians and 94% of this vision loss is either preventable or treatable. Yet 35% of Indigenous Australian adults reported that they have never had an eye examination (5,6). Australia is also the only developed country to still have endemic blinding trachoma, which exists in two thirds of remote Indigenous communities (7).

Blindness and poor vision can greatly reduce people's quality of life, mobility, ability to work and, in fact, can reduce life expectancy (8-10). Eye diseases have imposed a heavy burden to the Australian society, especially to Indigenous Australians. However, the accuracy of diagnosis and certainty of treatment for eye diseases are quite high, relative to many other chronic diseases. For example, cataract surgery may quickly restore the vision of a blind patient (11). A pair of prescribed glasses can correct poor eye sight immediately. Eye health care is regarded as one of the most cost-effective health interventions (12-15).

To achieve the goal to **Close the Gap for Vision** for Indigenous Australians requires adequate resources and a great deal of effort from all parties involved in vision and eye health. These parties include all levels of Government and non-Government organisations, eye health professionals and workers, as well as patients (16-19). This study aims to find out what extra resources are needed in order to **Close the Gap for Vision** for Indigenous Australians.

The extra resources needed to **Close the Gap for Vision** can be estimated by the difference between the amount needed to achieve the goal or ideal scenario of national standard and the amount currently spent on eye health care to Indigenous Australians. This seemingly simple task is actually quite difficult to implement due to the lack of available empirical data. Therefore, we have had to develop methods to estimate both the resources ideally needed and resources currently spent on eye health care services for Indigenous Australians.

2. Scope of Costing

It is well documented that the major eye health problems or gaps of Indigenous Australians involve four conditions: cataract, refractive error, diabetic retinopathy and trachoma (5, 20-25). Since trachoma has been dealt with by a specific Government program (26), this study focuses on estimating the cost needed to provide eye health care services for cataract surgery, refractive error and diabetic retinopathy for Indigenous Australians.

The components of costing include direct medical and associated non-medical costs required for Indigenous Australians to have full access to eye care services.

3. Objectives

This study has five main objectives:

1. To identify the ideal scenario of eye health needs in relation to the three major eye health gaps of Indigenous Australians – cataract, refractive error, and diabetic retinopathy.
2. To develop a comprehensive model for estimating the costs of the identified eye health needs and for the current spending in relation to eye health care services provided for those eye health gaps of Indigenous Australians.
3. To estimate annual eye health care costs required to meet the ideal utilisation rate in relation to eye health gaps of Indigenous Australians.
4. To estimate current annual spending on eye health problems of Indigenous Australians.
5. To determine the added annual eye health cost and a 5-year cost required to **Close the Gap for Vision** for Indigenous Australians.

Methods

1. Formulating Framework for Developing An Overall Costing Method

Almost no published research can be found that has focused on estimating the current spending on Indigenous eye health care or the expenditure needed to reach the national average use rate in Australia. Two pieces of work conducted by Access Economics (27, 28) have been useful at the stage of model building in this research. However, the purpose and scope of that research was different from those in this study. We have had to develop specific methods and models to estimate the cost of delivering adequate eye health care services in relation to cataract surgery, refractive error and diabetic retinopathy for Indigenous Australians. This method involves several major components as set out in the following sections.

2. Building the Model of Costing: A System-wide Comprehensive Pathway Approach

Based on a review of the literature (28-30), a system-wide comprehensive pathway approach has been used to capture and model the activities and resources involved in each of the three eye health care services. The model building process started from constructing a pathway of process and flow of activities and resources involved in providing care for each of the three main causes of vision loss. Each pathway/model is composed of major stages (denoted as the nodes in a model) to cover the whole process and flow for patients in each eye health service. The routes between stages were also identified for each pathway/model. Details of the three pathways/models are described and explained in the next section. Diagrams of the three pathways/models are presented in Appendix 1 to 3.

3. Estimating Differentiated Cost Based on the Remoteness of Geographical Regions

We have differentiated geographic areas into urban region versus remote region. This differentiation makes the model able to better resemble the real context of the eye health resources used and provided for Indigenous patients in the different regions. The two categories are differentiated by the remoteness as defined by the Australian Bureau of Statistics (ABS) (31):

Category 1 – Urban region includes both major city and inner regional areas as defined by ABS.

Category 2 – Remote region includes the other areas, i.e. outer regional, remote, very remote and other areas as defined by ABS.

We have modelled different support and costs for providing eye care in these two geographic regions. For example, patients living in remote areas need financial support for travel and accommodation when accessing eye health services, whereas patients living in urban areas do not need such support.

4. Assigning Probabilities of Patient Distribution for each Route in a Node (a stage/step) in each Pathway/Model

The pathway/model is built with health economic evaluation and modelling software - TreeAge Pro 2009 (32) so that the cost/coverage can be readily calculated or updated (i.e., the total figure of adding the probability of every route in a node equals one). The probability of every route in each node was based on our best estimates from field observations as firm data are not available. All the assumed probabilities in the node are listed in Tables 1 to 6 for the three eye health care services and separated into urban and remote regions.

5. Constructing a Resource Table of Costing Based on Uncapped Versus Capped Funding

The price of each resource (i.e., the cost component) used in each route for each of the three eye care services is estimated and presented as a resource table of costing (see Table 7). The source of information and calculation of the prices listed in the table are described and explained later in this section. To inform policy making, the cost components are further differentiated into five categories: (1) Uncapped funds from the Commonwealth Government, (2) Capped funds from the Commonwealth Government, (3) Co-ordination workforce, (4) Uncapped funds from the State and Territory Governments (5) Capped funds from the State and Territory Governments. Moreover, to make costs comparable, all costs in this report are adjusted to or calculated as the present value of 2011 and represented in Australian currency.

6. Calculating the Unit Cost of an Ideal Scenario of Providing Eye Care Services

Under the ideal scenario of 100% coverage of the national average usage rate applied to Indigenous communities, all patients in need are assumed to receive all the care required throughout the whole pathway of care, implying 0% patient lost (drop-out) rate in each node. The unit cost of the ideal scenario of an eye care service is the sum of the prices of all the inputs used in each of the routes, multiplied by the probability of the patient flow. Detailed descriptions and explanations for each of the three eye health services are presented later in the next section.

7. Calculating the Unit Cost of the Current Eye Care Services

The current scenario is adjusted to match the actual rate of utilisation of eye health care services obtained from the 2008 National Indigenous Eye Health Survey (NIEHS) (7). The unit cost of the current scenario of eye care is also the sum of the price of all the inputs used in each of the routes, multiplied by the probability of the patient flow. Detailed descriptions and explanations for each of the three eye health services are presented later in the next section. Compared to the ideal scenario, the current scenario contains drop-outs in every stage of the eye health care pathway. As a result, the unit cost of the current scenario is higher than that of the ideal scenario due to the fact that the cost of drop-outs is shared by current patients who complete the pathway of eye care provided.

8. Estimating the Total Cost Needed for Achieving Ideal Coverage

The major source of information for determining the ideal amount of eye care needed for each of the three eye health care services is obtained from the “Projected Needs for Eye Care Services for Indigenous Australians” (2011) (34), another report generated from this project to establish the national standard utilisation rates of eye care services. This report itself is based on data from the NIEHS (7) and the ABS (62). Please consult this report for further details of the method and data used in calculating the projected ideal eye health care needs.

According to this report, if cataract surgery in Indigenous people were to be performed at the same rate as for people in Australia as a whole (i.e., an annual cataract surgery rate of 9,500 operations per million people per year would be required), 4,382 cataract surgeries each year for Indigenous patients is the ideal number to be achieved for a population size of 455,028 from ABS (62). The overall 4,382 cataract surgeries to be performed each year is further divided into 2,073 cases for urban regions (i.e., 47.3% of the population live in urban areas, calculated from the NIEHS) and 2,309 cases for remote regions (i.e., 52.7% of the population live in remote areas, calculated from the NIEHS). By the same token, the overall ideal number of Indigenous Australians with refractive error who need glasses each year is 26,066 cases with 12,329 cases for urban regions and 13,737 cases for remote regions. The overall ideal number of Indigenous with diabetic retinopathy who need an annual eye examination each year is 39,292 (4,423 of this total need laser surgery) with 18,585 cases for urban regions and 20,707 cases for remote regions.

Therefore, the total cost needed for achieving an ideal 100% coverage rate can be estimated by the unit cost under the ideal scenario, multiplied by the total number of cases to be achieved.

9. Estimating the Total Current Spending on Indigenous Eye Health Care Services

Although precise data for the total current spending on Indigenous cataract surgery, refractive error and diabetic retinopathy are not available, this study has been able to estimate the current spending figures by using the model constructed above. The total current spending on Indigenous eye care can be estimated as the unit cost under the current scenario, multiplied by the number of patients who had completed the eye care, based on NIEHS ⁽⁷⁾, ABS ⁽⁶²⁾ and Kelaher's report ⁽⁴⁰⁾. For cataract surgery, 1,063 Australian inpatient cases with Indigenous status were identified in 2007/08 excluding the NT, due to lack of data. Moreover, Australian Institute of Health and Welfare (AIHW) estimated only 89% of Indigenous patients were correctly identified ⁽⁴⁷⁾. Therefore, the total Indigenous inpatient case number should be of the order of 1,194 using the population spread. It is estimated that 47.3% (i.e., 565 cases) and 52.7% (i.e., 629 cases) of total cases were performed in urban regions and remote regions, respectively. Similarly, for refractive error, the current coverage rate of glasses in urban and remote regions is simulated as 71.3% and 61.0% respectively. Therefore the annual number of glasses currently provided is estimated at 8,791 in urban regions and 8,380 in remote regions. By the same token, current coverage rates for diabetic retinopathy examination are estimated to be as 21.9% and 21.8% for urban and remote regions. Therefore the current number of diabetic eye examinations is estimated at 4,070 and 4,514 each year for urban and remote regions respectively.

10. Determining the Added Cost Required to **Close the Gap for Vision**

After completing the above nine steps, the added cost needed to **Close the Gap for Vision** can be derived by using the total cost needed to achieve the ideal amount of eye health care utilisation minus the current actual spending on eye health care to Indigenous Australians.

Treatment Pathways and Costing

1. Cataract Surgery

1.1 Specifications of the Pathway

The cataract surgery pathway involves four stages: (1) screening, (2) assessment, (3) surgery and (4) follow-up.

Stage 1: Screening

Screening is defined as the process from initial contact of a patient to the time prior to assessment by an ophthalmologist for cataract surgery. For Indigenous patients, the initial contact may be with an Aboriginal Health Worker (AHW), a General Practitioner (GP), or an optometrist, depending on resource availability and the health care seeking pattern of the patient. According to the NIEHS, cataract surgery coverage rate (i.e., the percentage of patients who need cataract surgery who have actually had that surgery) in urban and remote regions are about 68.3% and 64.3% respectively.

- Route 1: Patients screened by AHWs may be referred to GPs or optometrists.
- Route 2: Patients screened by GPs will be referred to optometrists.
- Route 3: Patients screened by optometrists will be referred to ophthalmologists directly to the next stage.

Patients in other possible but less frequent routes are not included e.g., patients with an eye injury who have been sent to the ophthalmologist or hospital directly.

Stage 2: Assessment

There is one route in this stage, because only ophthalmologists are eligible to assess the need for surgery.

Stage 3: Surgery

There is one route in this stage, i.e., surgery plus one- day follow-up by the surgeon is considered as one stage as they are covered by one payment.

Stage 4: Follow-up

This stage includes both one-week follow-up and one-month follow-up, after the one-day follow up. These follow-ups may be performed by the operating surgeon, but may also be performed by optometrists, especially in remote regions.

1.2 Assumptions and Estimations of Node Probabilities

A complete pathway in relation to cataract surgery is listed in Appendix 1. To estimate the unit and total costs per patient under this ideal situation, probabilities have been assumed in Table 1 as below:

Table 1 Assumed Probabilities for Cataract Surgery Under the Ideal 100% Coverage Rate

Stage	Item	Probability- Urban	Probability- Remote
Screening- First Contact	Probability of patients visiting AHW at first	0.1	0.5
	Probability of patients visiting GP at first	0.5	0.4
	Probability of patients visiting optometrist at first	0.4	0.1
Screening- Post AHW	Probability of patients visiting GP, referred by AHW	0.7	0.7
	Probability of patients visiting optometrist, referred by AHW	0.3	0.3
Screening Post GP	Patient retention rate after visiting GP	1	1
Assessment	Patient retention rate after visiting optometrist	1	1
Surgery	Patient retention rate after ophthalmologist assessment	1	1
Follow Up- 1 Week	Patient retention rate after surgery	1	1
Follow Up- 1 Month	Patient retention rate after 1 week follow up	1	1

Compared to the remote regions, patients in the urban regions have better access to GPs and optometrists, which implies a lower probability (0.1) for an AHW to conduct the screening process. In remote regions, on the contrary, the probability of an AHW being the first contact is likely to be much higher (0.5) and the supply of optometrists is likely to be lower. It was assumed that only 10% (0.1) of cataract patients are screened by optometrists.

To estimate the unit and total costs per patient based on current actual coverage rate, the probabilities are adjusted as follows, so that the resulted coverage rate resembles the coverage rate calculated from the NIEHS. Under the current scenario, there is an extra route for each node, indicating patients lost from the node.

The associated probabilities are listed in Table 2 below:

Table 2 Assumed Probabilities and Non-participation/Drop-out Rate for Cataract Surgery Under Current Coverage Rate

Stage	Item	Probability- Urban	Probability- Remote
Screening- First Contact	Probability of patients visiting AHW at first	0.1	0.5
	Probability of patients visiting GP at first	0.5	0.3
	Probability of patients visiting optometrist at first	0.25	0.05
	Probability of patients not entering the system	0.15	0.15
Screening- Post AHW	Probability of patients visiting GP, referred by AHW	0.7	0.7
	Probability of patients visiting optometrist, referred by AHW	0.2	0.2
	Probability of patients not going through to next step after visiting AHW	0.1	0.1
Screening Post GP	Patient retention rate after visiting GP	0.9	0.9
	Probability of patients not going through to next step after visiting GP	0.1	0.1
Assessment	Patient retention rate after visiting optometrist	0.95	0.95
	Probability of patients not going through to next step after visiting optometrist	0.05	0.05
Surgery	Patient retention rate after ophthalmologist assessment	0.9	0.9
	Probability of patients not going through to next step after being assessed by ophthalmologist	0.1	0.1
Follow Up- 1 Week	Patient retention rate after surgery	0.95	0.95
	Probability of patients not going to 1 week follow-up after surgery	0.05	0.05
Follow Up-1 Month	Patient retention rate after 1 week follow up	0.9	0.9
	Probability of patients not going to 1 month follow-up after surgery	0.1	0.1

For the current actual situation, the assumed distribution of probabilities among routes in each of the node follows the same rule applied for an ideal situation, i.e., most patients visit an AHW first in remote regions while those in urban regions most will visit their GPs first.

With these assumptions, the simulated coverage rates for urban and remote regions are 66.9% and 62.8% respectively, which are very close to the results from the national survey ⁽³³⁾, i.e. 68.3% and 64.3% respectively.

1.3 Cost Components

Category 1: Uncapped Funds from the Commonwealth Government

Uncapped (i.e., without a set limit) funds from the Commonwealth Government includes Medicare payments to GPs, optometrists and ophthalmologists, according to the amount of payment listed in the MBS (Medicare Benefits Schedule) in 2011.

Medicare payments to GPs may differ greatly depending on the time spent and complexity/length of consultation. In this report, GP income is used as a proxy to calculate how much a GP is paid for screening a patient. It is estimated that a GP's hourly rate is about \$150 and the average time spent for one patient is about 20 minutes. So, screening a patient by a GP is estimated to cost Medicare \$50.

An optometrist's visit is paid at \$58.10 per visit, and an ophthalmologist's assessment is paid at approximately \$90, based on the MBS, 2011.

Non-admitted (i.e., outpatient) cataract surgery is paid by Medicare at about \$630 per case. It is assumed that 50% of cataract surgeries are non-admitted for Indigenous patients.

A post operative optometrist visit is \$29.10 paid by Medicare, whether as a one-day, one-week or one-month post-surgery follow up (MBS, 2011).

Category 2: Uncapped Funds from the State and Territory Governments

Uncapped funds from State and Territory Governments include the State payment to public hospitals for cataract surgery. Although these funds are usually limited, they are considered as uncapped to be distinguished from the third category below.

Admitted (i.e., inpatient) cataract surgery is paid by the State at \$2,574 for urban regions and at \$2,930 for remote regions, based on the information extracted from the Victorian Weighted Inlier Equivalent Separation (WIES) calculator 2011 for Vic DRG C16Z. Again, it is assumed that 50% of Indigenous cataract surgery patients are admitted patients.

Category 3: Capped Funds

Capped (i.e., with defined limit) funds include special programs funded by the Commonwealth Government. These funds are usually limited in both dollar amount and time frame. This category includes Visiting Optometrist Scheme (VOS), Medical Specialist Outreach Assistance Program (MSOAP), Patient Assistance Travel Schemes (PATS) (named differently in each State and Territories) and glasses subsidy schemes.

VOS- Commonwealth Government

The average VOS payment per service is estimated at \$25.10 in addition to MBS costs after being inflated to 2011 value. Further information can be found on the website listed below:

[http://www.health.gov.au/internet/budget/publishing.nsf/Content/CC758E2A1FAFD62BCA2572D4001F8C58/\\$File/hfact23.pdf](http://www.health.gov.au/internet/budget/publishing.nsf/Content/CC758E2A1FAFD62BCA2572D4001F8C58/$File/hfact23.pdf)

MSOAP- Commonwealth Government

The average MSOAP payment per service is estimated at about \$134.80 (inflated to 2011 value) in addition to MBS costs. MSOAP cost per service delivered is adopted from the Annual reports of Rural Workforce Agency, Victoria, General Practice Queensland, Rural Doctors Workforce Agency SA, Rural Health West WA. However, data for NSW, TAS, ACT, and NT are not available from the management agency websites.

PATS- State and Territory Governments

The average PATS payment per travel for the remote region surgical cases is estimated at about \$290.20. This is drawn from the report to the Parliament of Australia Inquiry into the operation and effectiveness of Patient Assisted Travel Schemes (PATS), see below:

http://www.aph.gov.au/senate/committee/clac_ctte/completed_inquiries/2004-07/pats/submissions/sublist.htm

The figure has been inflated from the value in 2007 to the value in 2011.

Co-ordination- Both Commonwealth and State and Territory Governments

The project team estimated that 1.3 Equivalent to Full Time (EFT) of AHW time are required to co-ordinate cataract surgery related activities for 10,000 population, i.e. 100 cataract patients (please see Appendix 5 for detail). On average, 20.84 hours were spent with each patient, valued at about \$911 based on average AHW salary.

Information about AHW salaries was collected from the careers website in March 2011. The average annual salary with 20% on-cost is at about \$65,046.

2. Refractive Error

2.1 Specifications of the Pathway

The eye health care service provided for the refractive error pathway involves three stages: (1) screening and referral, (2) assessment and prescription, and (3) delivery.

Stage 1: Screening and Referral

Screening is the process from initial contact of a patient to the time prior to being assessed by an optometrist for glasses prescription. For Indigenous patients, the initial contact may be with an AHW or a GP, depending on resource availability and the health care seeking pattern of the patient. It is also possible a patient may skip the screening process, going to see an optometrist directly. According to the NIEHS, coverage rate in Urban and Remote regions are about 71.8% and 65.2% respectively.

- Route 1: Patients screened by an AHW may be referred to GPs or optometrists.
- Route 2: Patients screened by a GP will be referred to optometrists.
- Route 3: Patients screened by optometrists directly.

Stage 2: Assessment and Prescription

Optometrists normally perform the assessment and also dispense the prescription for glasses. Although ophthalmologists may also conduct assessment and prescribe glasses, they do not normally dispense glasses. Most frequently in the provision of eye care to Indigenous Australians these services are provided by optometrists either working alone or as part of an eye care team.

Stage 3: Delivery

Delivery includes both the payment for a collection of prescribed glasses by the patient or the mailing of glasses to the patient. When a patient is screened by an AHW, the AHW may also have ready-made glasses to deliver to a patient directly without a prescription from an optometrist. Although ready-made glasses cannot usually achieve perfect accuracy in terms of vision correction, they can help improve eyesight, particularly for near, at a lower price and in a shorter time frame. For those with normal distance vision, ready-made reading glasses do provide a very useful, readily available and cost effective alternative, following a full ocular examination.

2.2 Assumptions and Estimations of Node Probabilities

The complete pathway of the eye care service provided for refractive error is listed in Appendix 2. To estimate unit and total costs per patient under this ideal situation, probabilities are assumed in Table 3 as below:

Table 3 Assumed Probabilities for Refractive Error Under Ideal 100% Coverage Rate

Stage	Item	Probability - Urban	Probability-Remote
Screening – First Contact	Probability of patients visiting AHW first	0.1	0.5
	Probability of patients visiting GP first	0.5	0.4
	Probability of patients visiting optometrist first	0.4	0.1
Screening – Post AHW	Probability of patients visiting GP, referred by AHW	0.5	0.5
	Probability of patients visiting optometrist, referred by AHW	0.4	0.4
	Probability of AHW providing read-made glasses	0.1	0.1
Assessment	Probability of patients visiting optometrist, referred by GP	1	1
Delivery	Probability of patients receiving prescribed glasses by mail	0.3	0.3
	Probability of patients picking up prescribed glasses	0.7	0.7

Compared to remote regions, patients in urban regions have better access to GPs and optometrists, which implies a lower probability (0.1) of an AHW conducting the screening process. In remote regions, on the contrary, the probability of an AHW being the first contact is higher (0.5). The supply of optometrists in remote regions is likely to be lower and it was assumed that only 10% (0.1) of patients would be screened by optometrists.

We assume that there is no difference between urban and remote regions for the probability of an AHW referring patients to a GP or an optometrist and the probabilities are taken to be 50% (0.5) and 40% (0.4) respectively. Similarly it was assumed that there was no difference between urban and remote regions in the delivery of glasses with a 100% coverage rate.

Since it is not a common practice for AHWs to provide ready-made glasses, it is estimated that only 10% (0.1) patients use them in both urban and remote regions.

To estimate unit and total costs per patient based on current actual coverage rate, the probabilities are adjusted as follows to give coverage rates that resemble the rate calculated from the NIEHS (33). Under the current scenario, there is an extra route for each node, indicating a loss of patients from that node. The associated probabilities are listed in Table 4 below:

Table 4 Assumed Probabilities and Non-participation/ drop-out Rate for Refractive Error Under Current Coverage Rate

Stage	Item	Probability-Urban	Probability-Remote
Screening-First Contact	Probability of patients visiting AHW at first	0.1	0.5
	Probability of patients visiting GP at first	0.5	0.4
	Probability of patients visiting optometrist at first	0.35	0.05
	Probability of patients not entering the system	0.05	0.05
Screening-Post AHW	Probability of patients visiting GP, referred by AHW	0.5	0.5
	Probability of patients visiting optometrist, referred by AHW	0.4	0.4
	Probability of AHW providing ready-made glasses	0.05	0.05
	Probability of patients not going through to next step after visiting AHW	0.05	0.05
Assessment	Probability of patients visiting optometrists, referred by GP	0.9	0.9
	Probability of patients not going through to next step after visiting GP	0.1	0.1
Delivery	Probability of patients receiving prescribed glasses by mail	0.2	0.2
	Probability of patients picking up prescribed glasses	0.6	0.5
	Probability of patients not ordering prescribed glasses	0.2	0.3

Again for the current actual situation, the assumed distribution of probabilities among routes in each of the nodes follows the same rule applied for an ideal situation, i.e., most patients visit an AHW first in remote regions whereas those in urban regions will mostly visit their GPs first.

Given the uncommon nature of an AHW providing ready-made glasses, the probability is further reduced to 5% (0.05) in estimating real-world coverage.

For the choice between mail and pick-up for prescribed glasses, it is assumed that patients in both urban and remote regions have a similar preference towards mailing of 20% (0.2). It is estimated that patients living in remote regions will have a lower chance to order and to pick up prescribed glasses. Therefore the probabilities for patients in urban and remote regions of picking up glasses are estimated to be 60% (0.6) and 50% (0.5) respectively.

With these assumptions, the simulated coverage rates for urban and remote regions are 71.3% and 61% respectively, which are very close to the results from the national survey (33), i.e. 71.8% and 65.2% respectively.

2.3 Cost Components

Category 1: Uncapped Funds from the Commonwealth Government

Uncapped funds from the Commonwealth Government include Medicare payments to GPs and optometrists, according to the amount of payment listed in the MBS in 2011.

Medicare payments to GPs are estimated to cost Medicare \$50 as above.

Optometrist visit for screening is paid at \$58.10.

Category 2: Uncapped Funds from the State and Territory Governments

There are no uncapped funds from State and Territory Governments involved in refractive error. Services provided in public eye outpatient clinics to Indigenous people are believed to be small, although reliable data is not available. This cost has been omitted.

Category 3: Capped Funds

Capped (i.e., with a defined limit) funds include VOS, MSOAP and glasses subsidy schemes. There is no PATS cost for refractive error as it is a non surgical procedure.

VOS- Commonwealth Government

The average VOS payment per service is estimated at \$25.10 after adjustment for inflation.

Glasses Subsidy Schemes- State and Territory Governments

The price of ready-made glasses is estimated at about \$20.

There are two estimates for subsidy of prescribed glasses cost. The project team considers \$100 to be a reasonable value based on experience in Victoria (we have used this for calculating cost of glasses). A report conducted by Access Economics for the Centre for Eye Research Australia indicates a price of about \$160 at 2006 value. The inflated value for 2011 is about \$190. The report is available for download via the following link: <http://www.cera.org.au/uploads//placeholders/investinginsight.pdf>

Co-ordination- Both Commonwealth and State and Territory Governments

It was estimated that 2.7 EFT of AHW time are required to coordinate refractive error related activities for 10,000 people, i.e. 640 glasses (please see Appendix 5 for detail). On average, 6.76 hours were spent with each patient, valued at about \$273 based on average AHW salary (see also appendix 4).

3. Diabetic Retinopathy

3.1 Specifications of the Pathway

The diabetic retinopathy pathway is divided into 3 stages: (1) screening, (2) examination, and (3) treatment.

Stage 1: Screening

Screening is the process from initial contact of a patient to the time prior to being assessed by an optometrist. For Indigenous patients, the initial contact may be with an AHW or a GP, depending on resource availability and health care seeking pattern of the patient. It is also possible a patient may skip the screening process, going to see an optometrist directly. According to the NIEHS, the annual eye examination rates for those with diabetes in Urban and Remote regions are about 18.9% and 20.0% respectively. Treatment rates for those who required laser treatment in Urban and Remote regions are, 46.9% and 34.2% respectively.

- Route 1: Patients screened by an AHW may be referred to GPs or optometrists.
- Route 2: Patients screened by a GP will be referred to optometrists.
- Route 3: Patients screened by optometrists directly.

Stage 2: Examination

Examination could be performed by AHWs, GPs, optometrists or ophthalmologists. For AHWs and GPs, retinal cameras may be used as extra requirements as they are not usually present in all clinics. At times a nurse may also use a retinal camera, although this possibility was not included in the current model.

Stage 3: Treatment

Only ophthalmologists are eligible to perform laser treatment.

3.2 Assumptions and Estimations of Node Probabilities

The complete pathway of the eye care service provided for diabetic retinopathy is listed in Appendix 3. To estimate unit and total costs per patient under this ideal situation, the assumed probabilities are shown in Table 5:

Table 5 Assumed Probabilities for Diabetic Retinopathy Under Ideal 100% Coverage Rate

Stage	Item	Probability - Urban	Probability - Remote
Screening - First Contact	Probability of patients visiting AHW first	0.1	0.5
	Probability of patients visiting GP first	0.5	0.4
	Probability of patients visiting optometrist first	0.4	0.1
Screening - Post AHW	Probability of patients visiting GP, referred by AHW	0.6	0.6
	Probability of patients visiting optometrist, referred by AHW	0.4	0.4
Examination	Probability of patients visiting optometrist, referred by GP	1	1
Treatment	Probability of patients visiting ophthalmologist for treatment, of those examined by optometrists	0.115	0.115

In urban regions, patients have better access to GPs and optometrists, which implies a lower probability (0.1) for an AHW to conduct the screening process. In remote regions, on the contrary, the probability of an AHW being the first contact is much higher (0.5). The supply of optometrists in remote regions is low. It was assumed that only 10% (0.1) of patients are screened directly by optometrists.

It was assumed that there was no difference between urban and remote regions for chances of an AHW referring patients to a GP or an optometrist. The probabilities of an AHW referring a patient to a GP or an optometrist are 50% (0.5) and 40% (0.4) respectively.

The rate of screened patients requiring laser treatment after examination is about 11.6%. Of those requiring laser treatments, 46.9% and 34.2% of patients had received laser treatment in urban and remote regions, according to the survey of NIEHS (2009). The probability of a patient needing to visit an ophthalmologist for treatment is calculated by multiplying the two rates by 11.6%.

To estimate unit and total costs per patient based on current actual coverage rate, the probabilities are adjusted so the coverage rate resembles the coverage rate calculated from the NIEHS (33). Under the current scenario, there is an extra route for each node, indicating the loss of patients from the node. The associated probabilities are listed in Table 6 below:

Table 6 Assumed Probabilities and Non-participation/Drop-out Rate for Diabetic Retinopathy Under Current Coverage Rate

Stage	Item	Probability - Urban	Probability - Remote
Screening - First Contact	Probability of patients visiting AHW at first	0.1	0.4
	Probability of patients visiting GP at first	0.5	0.2
	Probability of patients visiting optometrist at first	0.05	0.05
	Probability of patients not entering the system	0.35	0.35
Screening - Post AHW	Probability of patients visiting GP, referred by AHW	0.3	0.3
	Probability of patients visiting optometrist, referred by AHW	0.1	0.1
	Probability of patients not going through to the next step after visiting AHW	0.6	0.6
Examination	Probability of patients visiting optometrist, referred by GP	0.3	0.4
	Probability of patients not going through to next step after visiting GP	0.7	0.6
Treatment	Probability of patients visiting ophthalmologist for laser treatment, referred by optometrist	0.0544	0.0397

For the current actual situation, the assumed distribution of probabilities among routes in each of the nodes follows the same rule applied for the ideal situation, i.e., most patients visit an AHW first in remote regions whereas those in urban regions will mostly visit their GPs first.

With these assumptions, the simulated coverage rates for urban and remote regions are 21.9% and 21.8% respectively, which are very close to the results from the national survey (33), i.e. 18.9% and 20% respectively.

3.3 Cost Components

Category 1: Uncapped Funds from the Commonwealth Government

As stated previously it is assumed that the uncapped cost of screening a patient by a GP is estimated to cost Medicare \$50.

An optometrist visit for a full eye examination is paid at \$58.10. If the examination is performed by an ophthalmologist, the same rate applies. For those AHWs and GPs who are also able to perform examination with retinal cameras, the estimated cost is at \$50 per case. At present, there is no Medicare funding for retinal photography. However, this application has been submitted to MASAC and hopefully, in the future, it will be covered by Medicare. For this calculation, we have assumed this service will be covered by Medicare. It is estimated that 5%, 15%, 30% and 50% of examinations are performed by GPs, AHWs, optometrists and ophthalmologists, respectively. At present Medicare only covers examinations done by optometrists and ophthalmologists.

An ophthalmologist is paid at approximately \$434 for laser treatment. It is assumed that 20% of services in urban regions are paid by Medicare, while 80% of services provided in remote regions are paid by Medicare. The remaining services would be performed in public hospitals and are paid for through uncapped State and Territory funds.

Category 2: Uncapped Funds from State and Territory Governments

Uncapped funds from State and Territory Governments include the State and Territory payment to public hospitals for retinal laser treatment. Although these funds are usually limited, they are considered uncapped, to be distinguished from the third category below.

According to the Victorian Ambulatory Classification & Funding System (VACS), an outpatient service for retinal laser clinic is paid at \$152.69.

It is assumed 80% of urban patients are treated in hospital while only 20% patients in remote regions attend hospital clinics.

Category 3: Capped Funds

VOS- Commonwealth Government

The average VOS payment per service is estimated at \$25.10 after adjustment to the 2011 value.

MSOAP- Commonwealth Government

As above the average MSOAP payment per service is estimated at about \$134.80 after adjustment to the 2011 value.

PATS- State and Territory Governments

The average PATS payment per travel for the remote region patient is estimated at about \$290.20 as set out above.

Co-ordination- Both Commonwealth and State and Territory Governments

The project team estimated that 3.8 (EFT) of AHW time are required to coordinate diabetic retinopathy related activities for 10,000 population, i.e. 960 eye examinations and 110 laser surgeries (please see Appendix 5 for detail). On average, 6.36 hours were spent with each patient, valued at about \$260 based on average AHW salary, (refer to appendix 4 for more detail).

4. Resource Table of Costing

According to the descriptions and explanations mentioned in previous sections, the resource table of costing for eye health care provided for cataract surgery, refractive error and diabetic retinopathy of Indigenous Australians can be presented in Table 7 below:

Table 7 Resource table of costing for cataract surgery, refractive error and diabetic retinopathy of Indigenous Australians, 2011

		Remote			Urban		
		Commonwealth Uncapped	State Uncapped	Capped	Commonwealth Uncapped	State Uncapped	Capped
Refractive Error	AHW screening cost	\$0	\$0	\$17.12 ^a	\$0	\$0	\$17.12 ^a
	GP screening cost	\$50 ^d	\$0	\$0	\$50 ^d	\$0	\$0
	Optometrist assessment and prescribing cost	\$58.1 ^f	\$0	\$25.1 ^g	\$58.1 ^f	\$0	\$0
	Glasses price - prescribed	\$0	\$0	\$100 ^b	\$0	\$0	\$100 ^b
	Glasses price - ready made	\$0	\$0	\$23.77 ^c	\$0	\$0	\$23.77 ^c
	Cost to send glass by mail	\$0	\$0	\$5.8 ^e	\$0	\$0	\$5.8 ^e
	Single patient travel cost (2 way)	\$0	\$0	\$290.2 ^h	\$0	\$0	\$0
Cataract Surgery	AHW screening cost	\$0	\$0	\$17.12 ^a	\$0	\$0	\$17.12 ^a
	GP screening cost	\$50 ^d	\$0	\$0	\$50 ^d	\$0	\$0
	Optometrist screening cost	\$58.1 ^f	\$0	\$25.1 ^g	\$58.1 ^f	\$0	\$0
	Ophthalmologist assessment cost	\$90 ^j	\$0	\$134.8 ^j	\$90 ^j	\$0	\$0
	Surgery cost	\$315 ^k	\$1,465 ^l	\$502.9 ^m	\$315 ^k	\$1,287 ⁿ	\$0
	1 week follow up cost	\$29.1	\$0	\$25.1 ^g	\$29.1	\$0	\$0
	1 month follow up cost	\$29.1	\$0	\$25.1 ^g	\$29.1	\$0	\$0
Single patient travel cost (2 way)	\$0	\$0	\$290.2 ^h	\$0	\$0	\$0	
Diabetic Retinopathy	AHW screening cost	\$0	\$0	\$17.12 ^a	\$0	\$0	\$17.12 ^a
	GP screening cost	\$50 ^d	\$0	\$0	\$50 ^d	\$0	\$0
	Examination cost	\$52.43 ^s	\$0	\$35.1 ^t	\$52.43 ^s	\$0	\$10 ^u
	Laser treatment cost	\$347.2 ^o	\$30.54 ^p	\$502.9 ^m	\$86.8 ^q	\$122.15 ^r	\$0
	Single patient travel cost (2 way)	\$0	\$0	\$290.2 ^h	\$0	\$0	\$0

- a. 30 minutes based on average annual salary and is calculated as part of co-ordination cost
- b. Project team assumption
- c. 2005 price inflated (46)
- d. Medicare paid, 30 minutes based on estimated average hourly rate
- e. Australian Post standard price
- f. Medicare payment (43)
- g. VOS payment inflated (44)
- h. Average 2-way PATS payment, inflated (45)
- i. Medicare payment (43)
- j. Average MSOAP payment, inflated (49 – 61)
- k. 50% of Medicare paid at \$630 per case (43)
- l. 50% of State payment for remote area at \$2,930 per case (48)
- m. Other related cost based on Angus Turner's data
- n. 50% of state payment for urban hospital at \$2,574 per case (48)
- o. 80% of remote treatment paid by Medicare at \$434 per case (43)
- p. 20% of remote treatment paid by State at \$152.69 per case (48)
- q. 20% of urban treatment paid by Medicare at \$434 per case (43)
- r. 80% of urban treatment paid by State at \$152.69 per case (48)
- s. 50% are performed by ophthalmologist at \$70 per case and 30% are performed by optometrist at \$58.1 per case, both paid by Medicare (43)
- t. \$10+\$25.1. 20% (5% GP, 15% AHW) examinations are done at \$50 per case. \$25.1 is VOS payment.
- u. 20% (5% GP, 15% AHW) examinations are done at \$50 per case

Results

This section will mainly focus on presenting the additional cost required in relation to the capped cost and the co-ordination staffing cost with two rationales.

First, the uncapped funds, namely the MBS costs paid by Medicare, has no limit set, while the capped funds, mainly the funds of MSOAP, VOS and PATS are limited. The capped funds largely assist optometrists and ophthalmologists travel to rural and remote areas to provide eye health care for residents in the remote regions in Australia. The PATS enables Indigenous patients in the remote regions to get access to the needed eye care. A significant number of residents in remote regions are Indigenous Australians.

Second, adequate funding for co-ordination of the patient journey is crucially needed to **Close the Gap for Vision** for Indigenous Australians. There is some expenditure currently occurring for co-ordination through Regional Eye Health coordinators, however much more is required. We have not been able to separate the proportion of the total current funding for those involved in co-ordination that comes from the Commonwealth and from the funding provided by the States and Territories.

1. Cataract Surgery

1.1 Estimated Indigenous cataract surgery cost required for 100% coverage (i.e., Ideal Scenario), 2011

Table 8 Estimated Indigenous Cataract Surgery Cost Required for 100% Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Cost per case	\$589	\$0	\$911	\$1,287	\$0	\$2,787
	Annual cost for 2,073 cases	\$1,220,997	\$0	\$1,888,503	\$2,667,951	\$0	\$5,777,451
	Cost for 5 years	\$6,104,985	\$0	\$9,442,515	\$13,339,755	\$0	\$28,887,255
Remote	Cost per case	\$589	\$713	\$911	\$1,465	\$290	\$3,968
	Annual cost for 2,309 cases	\$1,360,001	\$1,646,317	\$2,103,499	\$3,382,685	\$669,610	\$9,162,112
	Cost for 5 years	\$6,800,005	\$8,231,585	\$10,517,495	\$16,913,425	\$3,348,050	\$45,810,560
Total	Annual Cost for 4,382 case	\$2,580,998	\$1,646,317	\$3,992,002	\$6,050,636	\$669,610	\$14,939,563
	Cost for 5 Years	\$12,904,990	\$8,231,585	\$19,960,010	\$30,253,180	\$3,348,050	\$74,697,815

As shown in Table 8, the Commonwealth capped funds required to achieve an ideal scenario of cataract surgery for Indigenous Australians are around \$1.65 million per year and \$8.2 million over 5 years. The State and Territory Governments capped funds are \$0.67 million per year and \$3.5 million over 5 years (difference due to rounding). The co-ordination from both Commonwealth and State and Territory Governments is \$4 million per year and \$20 million over 5 years.

1.2 Estimated current spending on Indigenous cataract surgery, 2011

Table 9 Estimated Current Spending on Indigenous Cataract Surgery – 66.9% Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Cost per case	\$620	\$0	\$911	\$1,288	\$0	\$2,819
	Annual cost for 2,073 cases	\$350,300	\$0	\$514,715	\$727,720	\$0	\$1,592,735
	Cost for 5 years	\$1,751,500	\$0	\$2,573,575	\$3,638,600	\$0	\$7,963,675
Remote	Cost per case	\$631	\$728	\$911	\$1,467	\$290	\$4,027
	Annual cost for 2,309 cases	\$396,899	\$457,912	\$573,019	\$922,743	\$182,410	\$2,532,983
	Cost for 5 years	\$1,984,495	\$2,289,560	\$2,865,095	\$4,613,715	\$912,050	\$12,664,915
Total	Annual Cost for 4,382 case	\$747,199	\$457,912	\$1,087,734	\$1,650,463	\$182,410	\$4,125,718
	Cost for 5 Years	\$3,735,995	\$2,289,560	\$5,438,670	\$8,252,315	\$912,050	\$20,628,590

As shown in Table 9, the current annual total spending of capped funds on cataract surgery of Indigenous Australians is around \$0.46 million from the Commonwealth Government and \$0.18 million from the State and Territory Governments.

The co-ordination costs from both Commonwealth and State and Territory Government are around \$1.1 million per year and \$5.5 million over 5 years (difference due to rounding).

2. Refractive Error

2.1 Estimated Indigenous refractive error cost required for 100% coverage (i.e., Ideal Scenario), 2011

Table 10 Estimated Indigenous Refractive Error Cost Required for 100% Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case (glasses cost at \$100)	\$95	\$0	\$273	\$0	\$101	\$469
	Annual Cost for 12,329 cases	\$1,171,255	\$0	\$3,368,283	\$0	\$1,245,229	\$5,784,767
	Cost for 5 years	\$5,856,275	\$0	\$16,841,414	\$0	\$6,226,145	\$28,923,834
Remote	Per Case (glasses at \$100)	\$99	\$24	\$273	\$0	\$98	\$494
	Annual cost for 13,737 cases	\$1,359,963	\$329,688	\$3,752,948	\$0	\$1,346,226	\$6,788,825
	Cost for 5 years	\$6,799,815	\$1,648,440	\$18,764,742	\$0	\$6,731,130	\$33,944,127
Total	Annual cost for 26,066 cases	\$2,531,218	\$329,688	\$7,121,231	\$0	\$2,591,455	\$12,573,592
	Cost for 5 years	\$12,656,090	\$1,648,440	\$35,606,156	\$0	\$12,957,275	\$62,867,961

Table 10 indicates the total capped annual cost needed for achieving 100% coverage of refractive error for Indigenous Australians is around \$0.33 million from the Commonwealth Government and around \$2.6 million from the State and Territory Governments. The co-ordination costs to achieve all needed correction of refractive error for Indigenous Australians are \$7 million per year and around \$36 million over 5 years.

2.2 Estimated current spending on Indigenous refractive error, 2011

Table 11 Estimated Current Spending on Indigenous Refractive Error – 71.3% Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case (glasses cost at \$100)	\$124	\$0	\$273	\$0	\$101	\$498
	Annual Cost for 8,791 cases	\$1,090,084	\$0	\$2,401,701	\$0	\$887,891	\$4,379,676
	Cost for 5 years	\$5,450,420	\$0	\$12,008,506	\$0	\$4,439,455	\$21,898,381
Remote	Per Case (glasses at \$100)	\$152	\$34	\$273	\$0	\$98	\$558
	Annual cost for 8,380 cases	\$1,273,760	\$284,920	\$2,289,416	\$0	\$824,592	\$4,672,688
	Cost for 5 years	\$6,368,800	\$1,424,600	\$11,447,080	\$0	\$4,122,960	\$23,363,440
Total	Annual cost for 17,171 cases	\$2,363,844	\$284,920	\$4,691,117	\$0	\$1,712,483	\$9,052,364
	Cost for 5 years	\$11,819,220	\$1,424,600	\$23,455,586	\$0	\$8,562,415	\$45,261,821

Table 11 reveals the current annual total spending of capped funds for providing eye care services for refractive error of Indigenous Australians is around \$0.3 million from the Commonwealth Government and around \$1.7 million from the State and Territory Governments.

The current co-ordination costs for supporting refractive error correction to Indigenous Australians from both Commonwealth and State and Territory Governments are \$4.7 million per year and \$23.5 million over 5 years.

3. Diabetic Retinopathy

3.1 Estimated Indigenous diabetic retinopathy (examination and laser treatment) cost required for 100% coverage (i.e., Ideal Scenario), 2011

Table 12 Estimated Indigenous Diabetic Retinopathy Cost Required for *100% Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case	\$100	\$0	\$260	\$14	\$0	\$374
	Annual cost for 18,585 cases	\$1,858,500	\$0	\$4,835,817	\$260,190	\$0	\$6,954,507
	Cost for 5 years	\$9,292,500	\$0	\$24,179,085	\$1,300,950	\$0	\$34,772,535
Remote	Per Case	\$140	\$93	\$260	\$4	\$34	\$531
	Annual cost for 20,707 Cases	\$2,898,980	\$1,925,751	\$5,387,961	\$82,828	\$704,038	\$10,999,558
	Cost for 5 years	\$14,494,900	\$9,628,755	\$26,939,807	\$414,140	\$3,520,190	\$54,997,792
Total	Annual cost for 39,292 cases	\$4,757,480	\$1,925,751	\$10,223,778	\$343,018	\$704,038	\$17,954,065
	Cost for 5 years	\$23,787,400	\$9,628,755	\$51,118,892	\$1,715,090	\$3,520,190	\$89,770,327

As indicated in Table 12, the total capped costs needed for achieving the ideal scenario of providing eye care services to Indigenous Australians with diabetic retinopathy are around \$1.9 million per year, and around \$0.7 million per year from the Commonwealth Government and State and Territory Governments respectively. (The 5 year cost would be \$9.6 million and \$3.5 million respectively).

The co-ordination costs for achieving all needed diabetic retinopathy care for Indigenous Australians are \$10 million per year from both Commonwealth and State and Territory Governments and \$51 million over 5 years. Table 13 and Table 14 are sub-tables of Table 12. Table 12 has combined diabetic retinopathy eye examination and associated laser surgery data together, while Table 13 only includes the cost for laser surgery and Table 14 the cost for eye examination.

Table 13 Estimated Indigenous Diabetic Retinopathy Laser Surgery Cost Required for 100% Coverage (i.e., Ideal Scenario), in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case	\$10	\$0	\$0	\$14	\$0	\$24
	Annual cost for 18,585 cases	\$185,850	\$0	\$0	\$260,190	\$0	\$446,040
	Cost for 5 years	\$929,250	\$0	\$0	\$1,300,950	\$0	\$2,230,200
Remote	Per Case	\$40	\$0	\$0	\$4.00	\$0	\$44
	Annual cost for 20,707 Cases	\$828,280	\$0	\$0	\$82,828	\$0	\$911,108
	Cost for 5 years	\$4,141,400	\$0	\$0	\$414,140	\$0	\$4,555,540
Total	Annual cost for 39,292 cases	\$1,014,130	\$0	\$0	\$343,018	\$0	\$1,357,148
	Cost for 5 years	\$5,070,650	\$0	\$0	\$1,715,090	\$0	\$6,785,740

Table 14 Estimated Indigenous Diabetic Retinopathy Eye Examination Cost Required for 100% Coverage (i.e., Ideal Scenario), in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case	\$90	\$0	\$260	\$0	\$0	\$350
	Annual cost for 18,585 cases	\$1,672,650	\$0	\$4,835,817	\$0	\$0	\$6,508,467
	Cost for 5 years	\$8,363,250	\$0	\$24,179,085	\$0	\$0	\$32,542,335
Remote	Per Case	\$100	\$93	\$260	\$0	\$34	\$487
	Annual cost for 20,707 Cases	\$2,070,700	\$1,925,751	\$5,387,961	\$0	\$704,038	\$10,088,450
	Cost for 5 years	\$10,353,500	\$9,628,755	\$26,939,807	\$0	\$3,520,190	\$50,442,252
Total	Annual cost for 39,292 cases	\$3,743,350	\$1,925,751	\$10,223,778	\$0	\$704,038	\$16,596,917
	Cost for 5 years	\$18,716,750	\$9,628,755	\$51,118,892	\$0	\$3,520,190	\$82,984,587

3.2 Estimated current spending (examination and laser treatment) on Indigenous diabetic retinopathy, 2011

Table 15 Estimated Current Spending on Indigenous Diabetic Retinopathy – 21.9% Examination Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case	\$221.00	\$0	\$260	\$6.67	\$0	\$488
	Annual cost for 4,070 cases	\$899,470	\$0	\$1,059,014	\$27,147	\$0	\$1,985,631
	Cost for 5 years	\$4,497,350	\$0	\$5,295,070	\$135,735	\$0	\$9,928,155
Remote	Per Case	\$166.00	\$55	\$260	\$1.19	\$14	\$496
	Annual cost for 4,514 Cases	\$749,324	\$248,270	\$1,174,543	\$5,372	\$63,196	\$2,240,704
	Cost for 5 years	\$3,746,620	\$1,241,350	\$5,872,714	\$26,858	\$315,980	\$11,203,522
Total	Annual cost for 8,584 cases	\$1,648,794	\$248,270	\$2,233,557	\$32,519	\$63,196	\$4,226,335
	Cost for 5 years	\$8,243,970	\$1,241,350	\$11,167,784	\$162,593	\$315,980	\$21,131,677

As shown in Table 15, the current annual total spending of the capped funds to provide eye care services to diabetic retinopathy for Indigenous Australians are around \$0.25 million per year from the Commonwealth Government and \$0.06 million from the State and Territory Governments (\$1.2 million and \$0.3 million over 5 years).

The current co-ordination cost for supporting the eye care for Indigenous Australians with diabetic retinopathy is approximately \$2.2 million per year and \$11 million over 5 years. Table 16 and Table 17 are sub-tables of Table 15. Table 15 has combined diabetic retinopathy eye examination and associated laser surgery together whereas Table 16 only includes the cost for laser surgery and Table 17 only includes the cost for eye examination.

Table 16 Estimated Current Spending on Indigenous Diabetic Retinopathy Laser Surgery – 11.6% of Eye Examination Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case	\$5	\$0	\$0	\$6.67	\$0	\$12
	Annual cost for 4,070 cases	\$20,350	\$0	\$0	\$27,147	\$0	\$47,497
	Cost for 5 years	\$101,750	\$0	\$0	\$135,735	\$0	\$237,485
Remote	Per Case	\$14	\$0	\$0	\$1.19	\$0	\$15
	Annual cost for 4,514 Cases	\$63,196	\$0	\$0	\$5,372	\$0	\$68,568
	Cost for 5 years	\$315,980	\$0	\$0	\$26,858	\$0	\$342,838
Total	Annual cost for 8,584 cases	\$83,546	\$0	\$0	\$32,519	\$0	\$116,065
	Cost for 5 years	\$417,730	\$0	\$0	\$162,593	\$0	\$580,323

Table 17 Estimated Current Spending on Indigenous Diabetic Retinopathy Eye Examination – 21.9% Examination Coverage, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Urban	Per Case	\$216	\$0	\$260	\$0	\$0	\$476
	Annual cost for 4,070 cases	\$879,120	\$0	\$1,059,014	\$0	\$0	\$1,938,134
	Cost for 5 years	\$4,395,600	\$0	\$5,295,070	\$0	\$0	\$9,690,670
Remote	Per Case	\$152	\$55	\$260	\$0	\$14	\$481
	Annual cost for 4,514 Cases	\$686,128	\$248,270	\$1,174,543	\$0	\$63,196	\$2,172,137
	Cost for 5 years	\$3,430,640	\$1,241,350	\$5,872,714	\$0	\$315,980	\$10,860,684
Total	Annual cost for 8,584 cases	\$1,565,248	\$248,270	\$2,233,557	\$0	\$63,196	\$4,110,271
	Cost for 5 years	\$7,826,240	\$1,241,350	\$11,167,784	\$0	\$315,980	\$20,551,354

Summary of Cost Estimates

Total cost needed annually and for 5 years from 2011

Table 18 Estimated Total Cost Required for the 100% Coverage for Eye Care in Indigenous Australians, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Cataract Surgery	Annual Cost for 4,382 case	\$2,580,998	\$1,646,317	\$3,992,002	\$6,050,636	\$669,610	\$14,939,563
	Cost for 5 Years	\$12,904,990	\$8,231,585	\$19,960,010	\$30,253,180	\$3,348,050	\$74,697,815
Refractive Error	Annual cost for 26,066 cases	\$2,531,218	\$329,688	\$7,121,231	\$0	\$2,591,455	\$12,573,592
	Cost for 5 years	\$12,656,090	\$1,648,440	\$35,606,156	\$0	\$12,957,275	\$62,867,961
Diabetic Retinopathy	Annual cost for 39,292 cases	\$4,757,480	\$1,925,751	\$10,223,778	\$343,018	\$704,038	\$17,954,065
	Cost for 5 years	\$23,787,400	\$9,628,755	\$51,118,892	\$1,715,090	\$3,520,190	\$89,770,327
Total	Annual cost for all three conditions	\$9,869,696	\$3,901,756	\$21,337,012	\$6,393,654	\$3,965,103	\$45,467,221
	Cost for 5 years	\$49,348,480	\$19,508,780	\$106,685,058	\$31,968,270	\$19,825,515	\$227,336,103

Table 18 indicates the ideal total cost needed for treating all three eye conditions is around \$45.5 million a year, or \$227 million over 5 years, calculated at the present values of the Australian dollar in 2011. The required capped funds for both Commonwealth and State and Territory Governments are around \$3.9 million per year from the Commonwealth Government and \$4 million from the State and Territory Governments (\$20 million and \$20 million of the 5 years respectively). The co-ordination costs are \$21 million per year, and \$107 million over 5 years.

Current cost spent annually and for 5 years from 2011

Table 19 Estimated Current Spending on Indigenous Eye Care, in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Cataract Surgery	Annual cost for 1,194 cases	\$747,199	\$457,912	\$1,087,734	\$1,650,463	\$182,410	\$4,125,718
	Cost for 5 years	\$3,735,995	\$2,289,560	\$5,438,670	\$8,252,315	\$912,050	\$20,628,590
Refractive Error	Annual cost for 16,171 cases	\$2,363,844	\$284,920	\$4,691,117	\$0	\$1,712,483	\$9,052,364
	Cost for 5 years	\$11,819,220	\$1,424,600	\$23,455,586	\$0	\$8,562,415	\$45,261,821
Diabetic Retinopathy	Annual cost for 8,584 cases	\$1,648,794	\$248,270	\$2,233,557	\$32,519	\$63,196	\$4,226,335
	Cost for 5 years	\$8,243,970	\$1,241,350	\$11,167,784	\$162,593	\$315,980	\$21,131,677
Total	Annual cost for all three conditions	\$4,759,837	\$991,102	\$8,012,408	\$1,682,982	\$1,958,089	\$17,404,418
	Cost for 5 years	\$23,799,185	\$4,955,510	\$40,062,040	\$8,414,908	\$9,790,445	\$87,022,088

Table 19 shows the current expenditures used for all three eye conditions totals around \$17 million a year, or \$87 million over 5 years. The capped expenditure is around \$1 million per year, or \$5 million for 5 years from the Commonwealth Government, and \$2 million per year and \$10 million over 5 years from the State and Territory Governments. Current co-ordination spending could be \$8 million per year and \$40 million over 5 years.

Additional Funds Required to **Close the Gap for Vision**

Table 20 Additional Funds Required to **Close the Gap for Vision** (i.e., Estimated Costs of 100% Coverage Minus Current Spending), in 2011 Australian Dollars

		Commonwealth		Co-ordination Cost	State		Total
		Uncapped Cost	Capped Cost		Uncapped Cost	Capped Cost	
Cataract Surgery	Gap of annual cost	\$1,833,799	\$1,188,405	\$2,904,268	\$4,400,173	\$487,200	\$10,813,845
	Gap of cost for 5 years	\$9,168,995	\$5,942,025	\$14,521,340	\$22,000,865	\$2,436,000	\$54,069,225
Refractive Error	Gap of annual cost	\$167,374	\$44,768	\$2,430,114	\$0	\$878,972	\$3,521,228
	Gap of cost for 5 years	\$836,870	\$223,840	\$12,150,570	\$0	\$4,394,860	\$17,606,140
Diabetic Retinopathy	Gap of annual cost	\$3,108,686	\$1,677,481	\$7,990,222	\$310,499	\$640,842	\$13,727,730
	Gap of cost for 5 years	\$15,543,430	\$8,387,405	\$39,951,108	\$1,552,497	\$3,204,210	\$68,638,650
Total	Gap of annual cost	\$5,109,859	\$2,910,654	\$13,324,604	\$4,710,672	\$2,007,014	\$28,062,803
	Gap of cost for 5 years	\$25,549,295	\$14,553,270	\$66,623,018	\$23,553,362	\$10,035,070	\$140,314,015

Table 20 shows estimated additional funds to **Close the Gap for Vision** for Indigenous Australians. Altogether around \$28 million a year is required, or \$140 million over 5 years based on the present value of 2011.

Additional capped funds required are around \$3 million per year from Commonwealth Governments and \$2 million from the State and Territory Governments, or \$15 million and \$10 million for 5 years respectively.

The additional co-ordination costs required are about \$13 million per year, or \$67 million over 5 years from the Commonwealth and State and Territory Governments. The added co-ordination cost is around 46% of the total additional cost required.

Table 21 is a summary table that shows the estimated annual costs within each State and Territory of Australia.

These indicative estimates are based on the proportional distribution of costs determined by the numbers of urban, and regional and remote Indigenous residents in each State and Territory. Rounding errors account for the slight discrepancies within the table.

Table 22 provides estimated annual costs of eye care to a population of 10,000 Indigenous Australians, in both urban and remote locations.

Table 21: Estimated Annual Costs for Eye Care for Indigenous Australians by State/Territory; Condition and Funding Source, in 2011 Australian Dollars in Thousands

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total Cost
Cataract Surgery	\$127	\$4,547	\$1,762	\$4,189	\$ 839	\$550	\$990	\$1,928	\$14,932
Refractive Error	\$107	\$3,827	\$1,483	\$3,525	\$706	\$463	\$833	\$1,622	\$12,566
Diabetic Retinopathy	\$153	\$5,465	\$2,117	\$5,034	\$1,008	\$661	\$1,189	\$2,317	\$17,944
Total	\$387	\$13,839	\$5,362	\$12,748	\$2,553	\$1,674	\$3,012	\$5,867	\$45,442

Commonwealth	Uncapped Cost	\$84	\$3,004	\$1,164	\$2,767	\$554	\$364	\$654	\$1,273	\$9,864
	Capped Cost	\$33	\$1,188	\$460	\$1,094	\$219	\$144	\$258	\$503	\$3,899
Co-ordination Cost		\$181	\$6,495	\$2,516	\$5,982	\$1,198	\$786	\$1,414	\$2,753	\$21,325
State	Uncapped Cost	\$54	\$1,946	\$754	\$1,793	\$359	\$236	\$424	\$825	\$6,391
	Capped Cost	\$34	\$1,207	\$468	\$1,112	\$223	\$146	\$263	\$512	\$3,965
Total		\$386	\$13,840	\$5,362	\$12,748	\$2,553	\$1,676	\$3,013	\$5,866	\$45,444

Note: Rounding errors account for the slight discrepancies within the table

Table 22: Estimated Annual Costs for Eye Care for 10,000 Indigenous Australians; Urban and Remote Populations; Condition and Funding Source, in 2011 Australian Dollars in Thousands

		Urban Population of 10,000 People	Remote Population of 10,000 People
Cataract		\$265	\$378
Refractive Error		\$301	\$316
Diabetes		\$359	\$510
Total		\$925	\$1,204
Commonwealth	Uncapped Cost	\$213	\$253
	Capped Cost	\$0	\$172
Co-ordination Cost		\$512	\$512
State	Uncapped Cost	\$135	\$143
	Capped Cost	\$65	\$124
Total		\$925	\$1,204

Discussion

This study has developed a comprehensive and sophisticated costing model to estimate the current spending and additional direct funds required to **Close the Gap for Vision** by dealing with the three major eye problems that affect Indigenous Australians. Additional funds of \$28 million per year, or \$140 million over 5 years, would close this gap between Indigenous and non-Indigenous Australians. The additional amount is only a relatively small amount within the overall annual health budget of Australia ⁽³⁵⁾. However, its effectiveness is certain and the impact is large, especially when compared to the interventions for other major diseases such as cardiovascular disease and diabetes ⁽¹²⁻¹⁵⁾.

Full utilisation of eye care services by Indigenous Australians would not be achievable without addressing the need for good co-ordination within the eye health care system. The added co-ordination funding is crucial for eliminating the barriers to the demand for and the supply of eye care to all Indigenous Australians. The added co-ordination cost is around 46% of the total extra cost required to **Close the Gap for Vision** for Indigenous Australians. This cost has been only minimally funded in the past. The work is crucial and must be a priority if the gap is to be closed.

This is the first attempt that we are aware of to try to cost the current expenditure on the provision of Indigenous eye health, let alone estimate the costs of the additional service provision that will be required to **Close the Gap for Vision**. For this reason, it suffers from a number of limitations relating to the data that are available to base these calculations on. It is anticipated that future attempts will have a better database and more accurate information to build such projections on. We have attempted to clearly indicate the assumptions and extrapolations that we have made, however it is important to recognise the limits to the accuracy of the estimates in this study.

The estimated additional funds required to **Close the Gap for Vision** generated by this study may tend to be underestimated. Therefore, such estimations should be treated as a lower bound (or lower limit) of the required additional funds required.

The potential under-estimation of the additional funding required to is due to three reasons. The first is the underestimation of the cost for the ideal eye care needed by Indigenous Australians. This is because the ideal eye health need is based on the national average utilisation of eye health care system. The national average utilisation mainly reflects the eye health need of non-Indigenous Australians. Since eye health is poorer among adult Indigenous Australians than non-Indigenous Australians, the actual eye health need of Indigenous Australians could be higher than the national average. As a result, using the national average as a standard may have underestimated the ideal eye health need of Indigenous Australians.

The second reason is the possible underestimated population size of Indigenous Australians as the base of estimation. The population size of 455,028 is based on the census of ABS, 2006. The actual Indigenous population is likely to be larger in 2011 to 2015.

The third reason is the possible over estimation of the current spending on eye health care to Indigenous Australians. This is because the cost of co-ordination in the current eye health system is not available. To arrive at the current cost of co-ordination we have taken a proportion of the cost of the ideal level of co-ordination. This proportion matches the amount of eye care currently provided but may not match the money currently spent on co-ordinating that eye care. When we combine the impact of underestimation of the cost needed for achieving ideal eye health care and the impact of overestimation of the current spending on eye health care for Indigenous Australians, we may underestimate the additional cost required to **Close the Gap for Vision**. The estimates of State level funding and costs are only approximations as they are based on the distribution of National costs on a population basis. They may or may not reflect actual expenditures but they do provide an indicative figure.

Conclusion

This study has developed a comprehensive model from a system-wide approach to capture the processes and all activities that a patient may be involved within each of the pathways of eye care services provided for cataract, refractive error and diabetic retinopathy. The direct costs estimated in this study reflects the full health resources used by a patient in the eye health care system for the three major eye problems for Indigenous Australians.

This study also provides information regarding the cost needed to Close the Gap of Indigenous Australians for each State or Territory, although these costs should be regarded as the lower bound of additional costs required.

Estimated additional funds required to **Close the Gap for Vision** are the following (all in 2011 Australian dollars):

- Total cost required: \$45 million a year.
- Current spending: \$18 million a year.
- Added cost required: \$28 million a year or, \$140 million over 5 years.
- 46% of the added costs are for co-ordination of the pathway of care.

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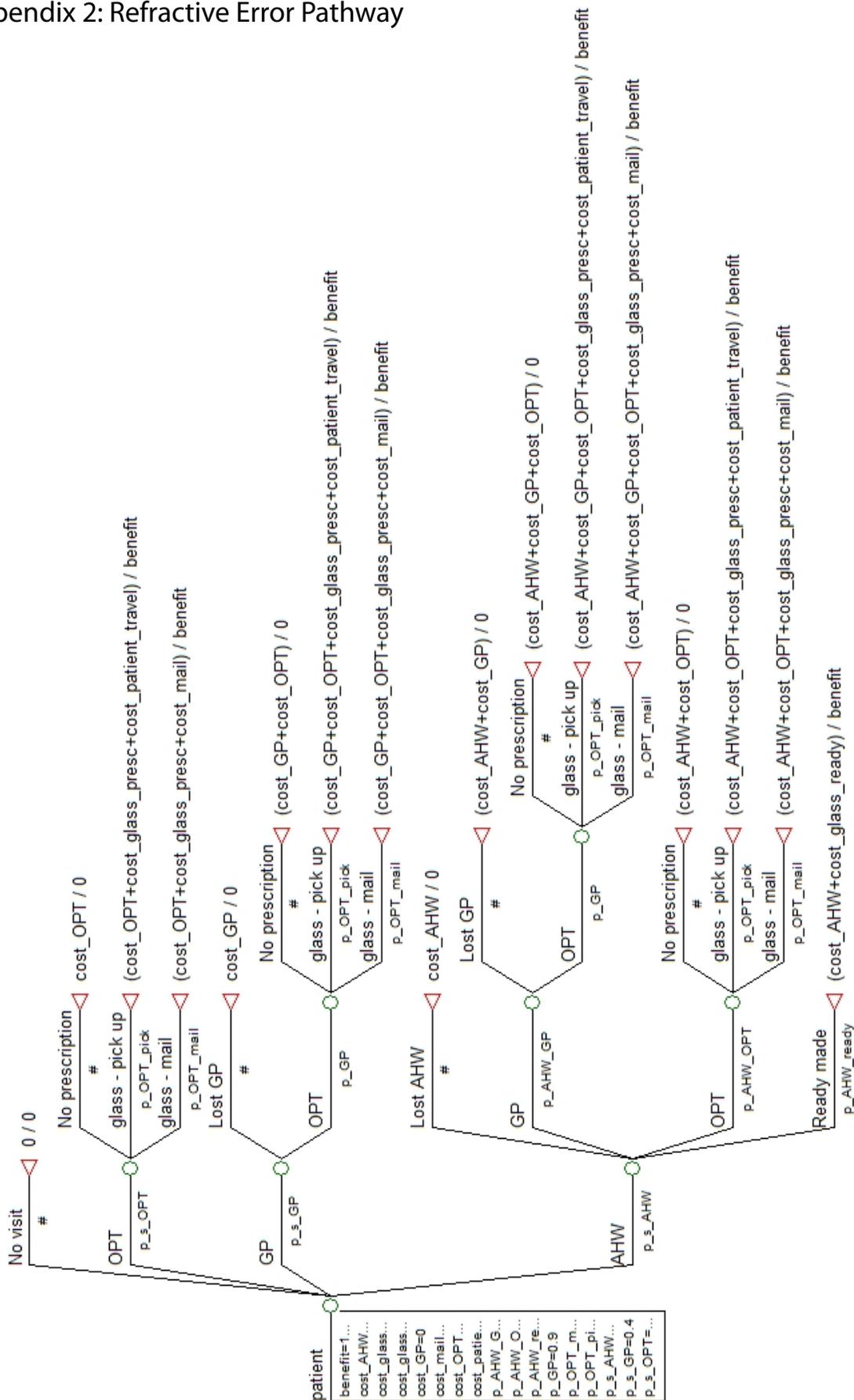
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All of these reports are available on the Indigenous Eye Health Unit website at: www.iehu.unimelb.edu.au

Appendix 2: Refractive Error Pathway



Appendix 4: Aboriginal Health Worker Salary Information

Position	Organisation	Salary
Aboriginal Health Officer	Council of Australian Governments (COAG) Better Access to Primary Care Services in Rural Areas Initiative	Salary \$51,474 - \$56,455 pa
Aboriginal Sexual Health Promotion Worker (Female)	WA Country Health Service	Salary \$51,474 - \$54,245 pa
Aboriginal Health Liaison Officer x 2	Department of Health WA	Salary \$64,318 - \$69,876 pa
Aboriginal Health Professional Male	Department of Health WA	Salary \$64,318 - \$69,876 pa
AHW	WA Government job website	AHW Level 1-3 \$39,460 - \$51,396 pa
Indigenous Mental Health Worker	Kimberley Mental Health and Drug Service (KMHDS)	Salary \$58,760 - \$63,007 pa
Clinical Aboriginal Health Worker	Nunkuwarrin Yunti (SA)	Salary \$46,898 - \$57,776 pa AHW Level 3 \$53,220 - \$57,776 AHW Level 2 \$46,898 - \$50,868
Caseworker – Aboriginal	Department of Community Services NSW	Salary \$58,249 - \$80,849 pa
Aboriginal Health Worker	WA Country Health Service	Salary \$42,168 - \$45,412 pa
Aboriginal Outreach Worker	www.caac.org.au	Base Salary: \$49,567- \$53,700 p.a. Total Salary: \$57,511- \$62,177 p.a.
Senior Health Worker, Primary Health Team	Queensland Government job	OO6: \$63958 - \$67438
Advanced Health Worker	Queensland Government job	OO4: \$49108 - \$54018
Generalist Health Worker, Hearing Health Unit Townsville	Queensland Government job	OO3: \$44902 - \$47125
Indigenous Health Project Worker	BEST MATCH RECRUITMENT - public employer	\$55-\$60k + salary packaging
Indigenous Outreach Worker	BEST MATCH RECRUITMENT - public employer	\$25 + super + salary packaging

With inclusion of 20% on cost, average annual cost for Aboriginal Health Worker is estimated at the level of \$65,046.

Appendix 5: Co-ordination of Eye Care Services for 10,000 People - by Activity

	No. of People	Organising Patient (hrs)	Organising Optometry Clinic (hrs)	Organising Ophthalmology Clinic (hrs)	Organising Hospital (hrs)	Total (hrs)
People	10,000					
Comprehensive Examinations	1,700					
2 Hours to Organise Each Patient (2x1700)		3,400				
1 Hour Transport Support		1,700				
213 (170/8) Days Optometry (54x4 day visits=216 days)						
2 Days to Organise Clinic of 4 Days (2x7.6x54)			821			
2 Days to Organise Visiting Team (2x7.6x54)			821			
Eye Clinic Support (216x7.6)			1,642			
Sub Total (hrs)		5,100	3,283			8,383
Glasses Prescribed	640					
1 Hour Per Patient Attendance (1x640)		640				
1 Hour Transport Support		640				
Delivery 12 Glasses/Day (640/12=54)						
Organise 54 Days Glasses Delivery at 0.5 Hours Per Day			27			
Eye Clinic Support (54x7.6)			410			
Sub Total (hrs)		1,280	437			1,717
Ophthalmology Consultations (Non Laser)	131					
2 Hours to Organise Each Patient (2x131)		262				
1 Hour Transport Support		131				
14 (131/10) Days Ophthalmology						
0.5 Days to Organise Clinic of 1 Day (0.5x7.6x14)				53		
0.5 Days to Organise Visiting Team (0.5x7.6x14)				53		
Eye Clinic Support (14x7.6)				106		
Sub Total (hrs)		393		213		606
Ophthalmology Consultations (Laser)	113					
Initial Treatment 2 Hours Per Patient Attendance (2x113)		226				
Additional/ Other Eye Treatment 2 Hours Per Attendance (2x113)		226				
Post Op Consultation 2 Hours Per Attendance (2x113)		226				
1 Hour Transport Support Per Visit (3x1x113)		339				
34 (226/8+113/20) Days Ophthalmology						
0.5 Days to Organise Clinic of 1 Day (0.5x7.6x34)				129		
0.5 Days to Organise Visiting Team (0.5x7.6x34)				129		
Eye Clinic Support (34x7.6)				258		
Sub Total (hrs)		1,017		517		1,534
Hospital Surgery	131					
Pre Op Consultation 3 Hours Per Patient Attendance (3x131)		393				
Surgery 2 Hours Per Attendance (2x131)		262				
Post Op Consultation 2 Hours Per Attendance (2x131)		262				
14 (131/10) Days Surgery Required						
14 (131/20x2) Days Pre and Post Op Required						
0.5 Days to Organise Hospital Services of 1 Day (0.5x7.6x(14+14))					106	
0.5 Days to Organise Visiting Team (0.5x7.6x(14+14))					106	
Sub Total (hrs)		917			213	1,130
Totals		8,707	3,721	730	213	13,370
Equivalent Full Time (EFT)		5.4	2.3	0.5	0.1	8.3
Total Hours	13,370					
EFT	8.3					

Appendix 6: Co-ordination of Eye Care Services for 10,000 People - by Condition

	No. of People	Refractive Error	Diabetic Retinopathy	Cataract	Trichiasis	Total
People	10,000					
Comprehensive Examinations (cases)	1,700	600	960	100	40	
2 Hours to Organise Each Patient (2x1700)						
1 Hour Transport Support						
213 (170/8) Days Optometry (54x4 day visits=216 days)						
2 Days to Organise Clinic of 4 Days (2x7.6x54)						
2 Days to Organise Visiting Team (2x7.6x54)						
Eye Clinic Support (216x7.6)						
Sub Total (hrs)		2,959	4,734	493	197	8,383
Glasses Prescribed (cases)	640	640				
1 Hour Per Patient Attendance (1x640)						
1 Hour Transport Support						
Delivery 12 Glasses/Day (640/12=54)						
Organise 54 Days Glasses Delivery at 0.5 Hours Per Day						
Eye Clinic Support (54x7.6)						
Sub Total (hrs)		1,717				1,717
Ophthalmology Consultations (cases) (Non Laser)	131			95	36	
2 Hours to Organise Each Patient (2x131)						
1 Hour Transport Support						
14 (131/10) Days Ophthalmology						
0.5 Days to Organise Clinic of 1 Day (0.5x7.6x14)						
0.5 Days to Organise Visiting Team (0.5x7.6x14)						
Eye Clinic Support (14x7.6)						
Sub Total (hrs)				439	166	606
Ophthalmology Consultations (cases) (Laser)	113		113			
Initial Treatment 2 Hours Per Patient Attendance (2x113)						
Additional/ Other Eye Treatment 2 Hours Per Attendance (2x113)						
Post Op Consultation 2 Hours Per Attendance (2x113)						
1 Hour Transport Support Per Visit (3x1x113)						
34 (226/8+113/20) Days Ophthalmology						
0.5 Days to Organise Clinic of 1 Day (0.5x7.6x34)						
0.5 Days to Organise Visiting Team (0.5x7.6x34)						
Eye Clinic Support (34x7.6)						
Sub Total (hrs)			1,534			1,534
Hospital Surgery (cases)	131			95	36	
Pre Op Consultation 3 Hours Per Patient Attendance (3x131)						
Surgery 2 Hours Per Attendance (2x131)						
Post Op Consultation 2 Hours Per Attendance (2x131)						
14 (131/10) Days Surgery Required						
14 (131/20x2) Days Pre and Post Op Required						
0.5 Days to Organise Hospital Services of 1 Day (0.5x7.6x(14+14))						
0.5 Days to Organise Visiting Team (0.5x7.6x(14+14))						
Sub Total (hrs)				819	310	1,130
Totals		4,676	6,268	1,752	674	13,370
Equivalent Full Time (EFT)		2.9	3.9	1.1	0.4	8.3
Total Hours	13,370					
EFT	8.3					

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