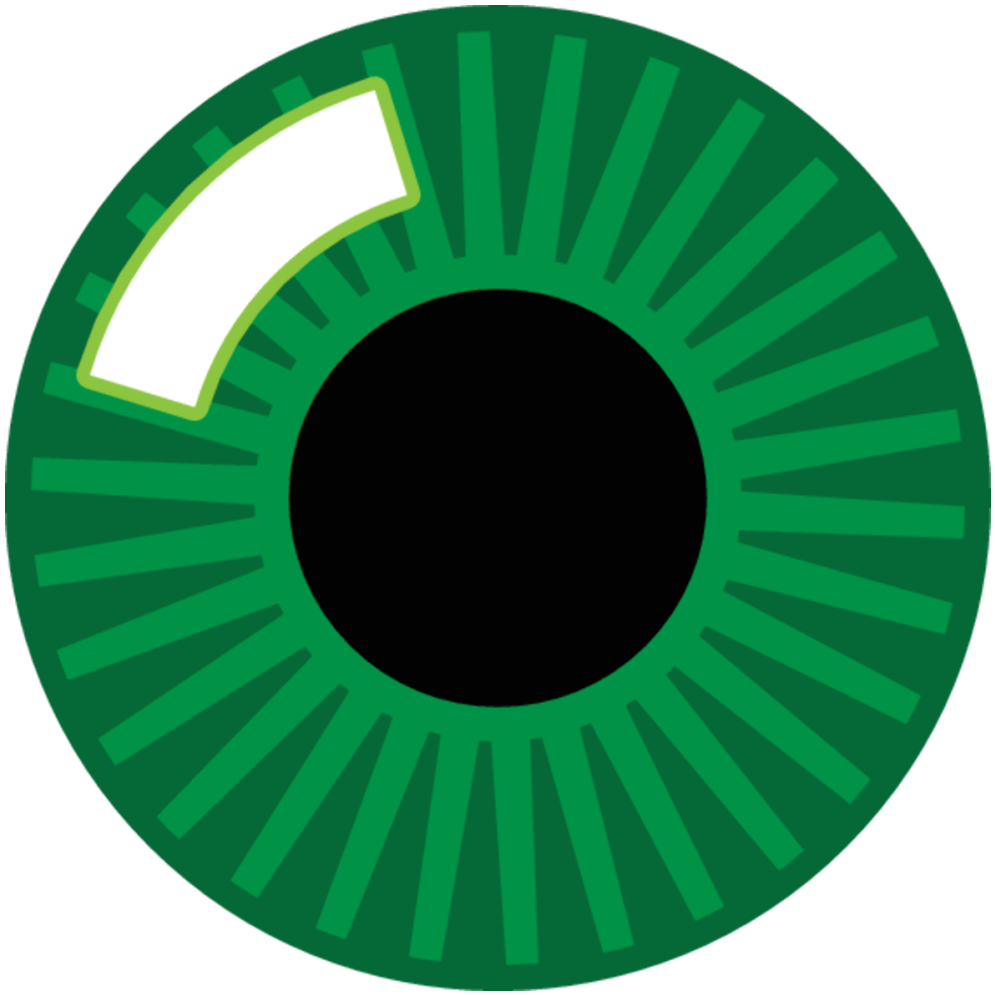
Deloitte.



The value of accessing ophthalmic devices through the Prostheses List

Medical Technology Association of Australia

June 2019

Deloitte Access Economics

Contents

Glossary i

Executive summary 2

1 Introduction 7

2 Overview of the Prostheses List 9

2.1 Introduction to the Prostheses List 9
2.2 Prostheses for cataract and glaucoma 10

2.2.1 Cataract 10
2.2.2 Glaucoma 12

2.3 Reform to ophthalmic devices listed on the Prostheses List 13

3 Costs of cataract and value of the Prostheses List 15

3.1 Methodology to estimate the costs of cataract 15
3.1 Health system expenditure 16

3.1.1 Cost of separations 17
3.1.2 Out-of-hospital and other professional costs 18
3.1.3 Pharmaceuticals 19
3.1.4 Research costs 20
3.1.5 Aged care 20
3.1.6 Falls and depression 20
3.1.7 Summary of health system expenditure for cataract 21

3.2 Productivity costs 22

3.2.1 Reduced workforce participation 23
3.2.2 Absenteeism 23
3.2.3 Presenteeism 24

3.3 Informal care costs 25
3.4 Other financial costs 25
3.5 Deadweight losses 26

3.5.1 Welfare payments 26
3.5.2 Taxation revenue 27
3.5.3 Deadweight losses of taxation payments and administration 27

3.6 Burden of disease 28

3.6.1 Valuing life and health 29
3.6.2 Mortality 29
3.6.3 Wellbeing costs 29

3.7 Value of the Prostheses List 31

3.7.1 Summary of costs of cataract in Australia 31
3.7.2 Savings to society from private surgery 33

4 Discussion 38

4.1 Information from patient interviews 38
4.2 Potential impact of reforms to the Prostheses List 44
4.3 Conclusions 45

Appendix A : Epidemiology of cataract 46

A.1. Prevalence of cataract in Australia 46
A.2. Severity of cataract 47
A.3. Mortality from cataract 48

Appendix B : Interview questions 49

B.1. Interview questions 49

Limitation of our work 51

General use restriction 51

Charts

Chart 3.1 : Loss of wellbeing associated with cataract in Australia, 2017-18 31
Chart 3.2 : Financial costs associated with cataract by component (LHS) and payer (RHS), 2017-18 32

Tables

Table i : Savings to society from private cataract surgeries, by payer, 2017-18, $m 4
Table ii : Savings to society from private cataract surgeries, by payer, 2017-18, $ 5
Table 2.1 : Listed benefits for IOLs listed on the PL, August 2018 12
Table 2.2 : Changes to the MBP for ophthalmic devices 14
Table 3.1 : Estimated cataract separations by age and gender, 2017-18 17
Table 3.2 : Estimated cataract surgery separations by state/territory, 2017-18 18
Table 3.3 : Spectacle independence following cataract surgery 19
Table 3.4 : Summary of health system costs of cataract, 2017-18 22
Table 3.5 : Cataract surgery recovery tracker 24
Table 3.6 : Estimated cataract-related welfare payments in 2017-18 27
Table 3.7 : DWL due to cataract in Australia, 2017-18 28
Table 3.8 : Cataract disability weights 2016 30
Table 3.9 : Total costs associated with cataract in Australia by cost bearer, 2017-18 32
Table 3.10 : Estimated waiting times for private cataract surgery 34
Table 3.11 : Waiting times for public cataract surgery, by state and territory, 2017-18 34
Table 3.12 : Savings to society from private cataract surgeries, by payer, 2017-18 36
Table 3.13 : Additional savings that could be realised if public cataract surgeries occurred in the private sector, by payer, 2017-18 37
Table A.1 : Prevalence of visual impairment and blindness from cataract, 2016 46
Table A.2 : Estimated prevalence of cataract in Australia by age and gender, '000s, 2017-18 47
Table A.3 : Estimated prevalence of cataract with visual impairment, 2017-18 48
Table A.4 : Estimated mortality from cataract in Australia by age and gender, 2017-18 48

Figures

Figure 2.1 : Prosthesis supply setting (simplified) 9

Glossary

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
DALY	disability adjusted life year
DWL	deadweight losses
IOL	intraocular lens
MBP	minimum benefit payable
MBS	Medicare Benefits Schedule
MIGS	minimally invasive glaucoma surgery
PHI	PHI
PL	Prostheses List
VSL(Y)	value of a statistical life (year)
YLD	year of healthy life lost due to disability
YLL	year of life lost due to premature death

Executive summary

Background

In 2016, more than 453,000 Australians aged 50 years or over were identified as having visual impairment. Of those with visual impairment or blindness, the five major eye conditions – cataract, macular degeneration, glaucoma, diabetic eye disease, and refractive error – accounted for three-quarters of all cases.

Implantable prostheses (or devices) can be used to improve vision for patients experiencing conditions such as cataract and glaucoma. These ophthalmic prostheses can also prevent further visual deterioration. A growing number of people are receiving ophthalmic prostheses due to Australia's ageing population and the increasing prevalence of these conditions.

In Australia, prostheses are accessed via two pathways. In the public health system, patients receive treatment in a public facility, with the cost of prostheses paid for from public health funding. Alternatively, privately insured patients access prostheses through the Prostheses List (PL), which is a list of approved prostheses. Private health insurance (PHI) providers pay a rebate – the minimum benefit payable (MBP) – for the ophthalmic device.[1]

Recent reforms to the PL have reduced the MBP (or price) for ophthalmic devices, with the intention that reducing prostheses expenditure for PHI providers will flow through to reduced premiums, thus increasing PHI coverage and affordability. However, as outlined in Section 4, the reductions in MBP for ophthalmic devices may not translate into improved PHI coverage or affordability for patients.

Moreover, a reduction in the MBP for ophthalmic devices may lead to worse long-term patient outcomes, with an associated increase in healthcare costs. For example, the lower MBP may limit the ability of prostheses suppliers to develop innovative products and participate in the market. If the rate of products entering the market declines, patients will no longer benefit from newer technologies entering the market. Some of the main benefits for patients include the greater spectacle independence offered by newer, but also more expensive technologies. Future innovation is necessary in the medical devices and prostheses sector as new products often deliver incremental, but important, developments in design or features.

In addition, Government reforms intended to increase PHI coverage and affordability for patients, need to be balanced with the goal of ensuring patients continue to have access to a range of treatment choices. PHI and the PL offers patients the option of choosing their own doctor, their hospital for treatment and a range of innovative medical technologies that best suits their clinical need.

Further, many suppliers provide ancillary services to support clinicians and hospitals in the use of ophthalmic devices. These services encourage greater adoption of newer technologies, but more importantly, they help facilitate improved patient outcomes by optimising the use of ophthalmic devices. A reduction in the MBP may reduce the level of ancillary services offered, which may lead to an associated reduction in patient outcomes.

Value of the PL

Access to ophthalmic devices through the PL delivers a range of benefits to Australian patients and government. The key benefits explored in this report include the enhanced patient outcomes that are available to patients who access devices on the PL, and shorter waiting times for patients accessing cataract surgery through the private sector.

The value of the PL to patients and government was explored by analysing the costs of cataract, which is the most common ophthalmic surgery in Australia, with benefits in relation to glaucoma or

[1] A description of how the PL works is provided in Section 2

other eye conditions conservatively excluded from scope due to data limitations and other reasons. Cataract imposes a substantial burden on individuals by ultimately reducing vision of the individuals, leading to a broad range of costs including: health system expenditure, productivity losses, informal care costs, reliance on aids and modifications, and reduced wellbeing.

The costs of cataract were quantified using the cost of illness methodology. The costs of cataract were estimated for the year 2017-18 using a prevalence approach to cost estimation. In 2017-18, 1.9 million Australians were living with cataract, of whom 110,000 had visual impairment due to cataract. Treating cataract costs the health system $795.4 million each year, or $3,121 per surgery. Overall, the total financial costs associated with cataract were estimated to be $1.1 billion in 2017-18, or $4,430 per surgery. Including the loss of wellbeing, the total costs of cataract were an estimated $2.4 billion, or $9,465 per surgery.[2] Expenditure on ophthalmic devices for cataract represents 12% of the total financial costs and 6% of the total costs of cataract.

The value of reduced waiting times, which is enabled by the PL, was quantified by multiplying the average daily cost per surgery by the difference in waiting period (69 days) between the private and public sector, and by the number of private surgeries (177,396). Of the total costs, an estimated 65% could be averted through a change in waiting times, so the average daily cost per surgery was equivalent to $16.77 per surgery per day.[3] Thus, the value of timely treatment reduced financial and wellbeing costs by an estimated $205.3 million. The wellbeing components represent the largest gain ($168.9 million), which is a benefit for patients. Of the $36.4 million in financial savings from reduced waiting times, individuals save $16.3 million, government saves $10.2 million, and society saves $9.9 million (Table i).

[2] Not all cataract surgery patients have visual impairment at the time of their surgery. The wellbeing impacts of visual impairment at the time of surgery were assumed to be the same as the wellbeing impacts due to prevalence of visual impairment due to cataract in Australia. Primarily, this assumption was made to ensure that the wellbeing impacts were not overstated, reflecting the progressive nature of cataract. Only about 5% of people with cataract have mild to moderate visual impairment, and 1% have severe visual impairment (blindness) (see Appendix A). Combined, about 110,000 people have visual impairment due to cataract. Given there are approximately 250,000 cataract surgeries each year, only about half are likely to involve visual impairment due to cataract, and most of that is likely to be mild visual impairment. More detail on the burden of disease methodology is provided in section 3.6.

[3] The average cost per day includes both financial and wellbeing costs, so it is calculated as $9,465 divided by 365, which is equivalent to approximately $26 per surgery per day.

Table i: Savings to society from private cataract surgeries, by payer, 2017-18, $m

Savings component	Individuals/ Families	Governments	Other parts of society	Total
Savings from reduced waiting times				
Falls, depression and aged care	1.6	4.9	0.3	6.8
Informal care	0.9	0.5	-	1.5
Reduced employment	7.1	4.8	2.5	14.4
Aids and modifications	6.7	-	-	6.7
DWL savings from reduced waiting times	-	-	7.1	7.1
Wellbeing savings (non-financial)	168.9	-	-	168.9
Subtotal	*185.2*	*10.2*	*9.9*	*205.3*
Savings from patient shifting				
Surgery	-36.9	324.1	-224.1	63.1
DWL savings from patient shifting	-	-	103.0	103.0
Subtotal	*-36.9*	*324.1*	*-121.1*	*166.1*
Total financial savings	**-20.6**	**334.3**	**-111.2**	**202.5**
Total savings (including wellbeing)	**148.3**	**334.3**	**-111.2**	**371.4**

Source: Deloitte Access Economics analysis.

The remaining financial savings are derived from shifting patients from the public to the private sector where the cost per surgery is lower overall. When a patient chooses to be treated in the private rather than the public sector, the government only pays indirectly through the premium rebates. The government pays $1,827 less for a private surgery than a public surgery, while individuals pay $208 more (out-of-pocket), and insurers pay $1,263[4]. Deadweight losses (DWL), which refer to reduced economic efficiencies associated with the need to raise additional taxation to fund the provision of government services, were reduced by $580 per surgery. The reduction in DWL is a benefit for society. In aggregate, individuals pay $36.9 million more, governments pay $324.1 million less, insurers pay $224.1 million more, and DWL are $103.0 million lower.[5]

The net savings to individuals and their families/carers was worth an estimated $148.3 million. The wellbeing gains for individuals ($168.9 million) substantially outweighed the increase in out of pocket expenditure ($20.6 million).[6] The saving to governments was worth an estimated $334.3 million, and society overall was better off by an estimated $371.4 million. Other parts of society pay an additional $111.2 million, of which PHI companies pay an additional $224.1 million, partly offset by the DWL savings ($103.0 million).

If more patients were to shift to the private sector, there would be additional savings for society, individuals and governments, although insurers would pay more. For each additional surgery in the private sector, individuals save $836 (largely through improved wellbeing), governments save $1,885, insurers pay $1,263 more and society saves $636, so that "other parts of society", which includes insurers, employers, other parties and society, pay $627 more overall (Table ii).

[4] While insurers pay more, the costs are met through patient premiums.
[5] The average costs were multiplied by the number of surgeries to derive the savings and costs. For example, the cost to individuals ($36.9 million) is derived by multiplying $208 by the number of surgeries (177,396).
[6] Patients realise savings of $16.3 million from reduced waiting times, but they have an increase in out-of-pocket expenditure of $36.9 million for surgeries in the private sector.

Table ii: Savings to society from private cataract surgeries, by payer, 2017-18, $

Savings component	Individuals/ Families	Governments	Other parts of society	Total
Savings from reduced waiting times				
Falls, depression and aged care	9	28	2	38
Informal care	5	3	-	8
Reduced employment	40	27	14	81
Aids and modifications	38	-	-	38
DWL savings from reduced waiting times	-	-	40	40
Wellbeing savings (non-financial)	952	-	-	952
Subtotal	*1,044*	*58*	*56*	*1,157*
Savings from patient shifting				
Surgery	-208	1,827	-1,263	356
DWL savings from patient shifting	-	-	580	580
Subtotal	-208	1,827	-683	936
Total financial savings	**-116**	**1,885**	**-627**	**1,142**
Total savings (including wellbeing)	**836**	**1,885**	**-627**	**2,093**

Source: Deloitte Access Economics analysis.

If the private sector performed all current public cataract surgeries instead of the public sector, the additional value to individuals and their families/carers would be worth approximately $64.7 million, and the additional value to governments would be worth $146.0 million. However, other parts of society would pay an additional $48.6 million. Overall, Australia would be better off by $162.1 million.

The value of the PL is more directly reflected by the additional value derived from technologies that are available on the PL, but not in the public sector. Unfortunately, data on the exact market share of each lens technology in the private and public sector are not available. Thus, it is not possible to estimate this direct value accurately. However, advice from suppliers indicates that all presbyopia-correcting devices are provided in the private sector (through the PL). For cataract, data from a survey of European ophthalmologists indicates that premium device technologies make up approximately 13% of the market, which is the equivalent of 33,000 devices if the same proportion applies in Australia.

Approximately 85% of patients who receive premium devices no longer require spectacles, compared to 10% of patients who receive monofocal devices. Thus, the value of the PL to patients who receive premium technologies is likely to be $2.7 million this year alone, although these lenses will last for a number of years.[7] On average, presbyopia-correcting lenses on the PL cost $861, and monofocal lenses cost approximately $300. Considering the savings from spectacles alone, the premium lenses will likely become cost saving within 3 years.[8] Patients will also enjoy the greater wellbeing benefits offered by the premium technologies.

Interviews were conducted with eight patients to provide qualitative information, which identified an improved experience of treatment in the private system relative to the public system. Patients

[7] Assuming that each patient requires 2 devices, so premium lenses were provided to 16,500 patients in 2017-18, and an additional 12,375 (75%, or the difference in spectacle independence rates multiplied by 16,500 patients) patients no longer required spectacles. These patients no longer need to purchase spectacles or see an optometrist, which is a saving of $220 following cataract surgery (section 3.1.2).
[8] Assuming that each patient will have required a new pair of spectacles each year (including a consultation with an optometrist).

reported positive experience due to choice, not only of the surgeon or hospital, but also of the type of ophthalmic device they received. Patients often made decisions based on the difference in waiting times, and often expressed a desire to have the surgery as soon as possible. Despite the difference in outcomes between patients, and the value they place on aspects of choice, ophthalmic surgery is generally highly cost effective in public as well as private settings because it reduces the burden on an individual's wellbeing and enables improved sight. The improved wellbeing was a consistent theme from the interviews.

Conclusion

The PL supports the value proposition of private health insurance in Australia. Its value is most evident through the substantial benefits it provides to patients in the form of enhanced health outcomes and long-term healthcare savings. It also offers significant value to both government and society as a whole. The PL allows for timely access to cost effective private ophthalmic surgeries which reduces the economic burden of ophthalmic conditions and also improves patient choice of ophthalmic device.

By reducing payments for ophthalmic devices on the PL, it is possible that some of these benefits may be eroded. For example, reduced revenue may reduce the ability of niche technology providers to bring new products to the market. Similarly, hospitals and clinicians (with the ability to do so) may treat a higher proportion of patients in public pathways if the incentive to treat them privately is reduced. The PL is a valuable asset to both patients and government, providing both health and economic benefits to Australia. Therefore, any changes that might negatively affect the PL should be carefully considered.

1 Introduction

In 2016, more than 453,000 Australians aged 50 years or over were identified as having visual impairment.[9] Of those with visual impairment or blindness, the five major eye conditions – cataract, macular degeneration, glaucoma, diabetic eye disease, and refractive error – accounted for three-quarters of all cases.

Implantable prostheses (or devices) can be used to improve vision for patients experiencing conditions such as cataract and glaucoma. These ophthalmic prostheses can also prevent further visual deterioration. A growing number of people are receiving ophthalmic prostheses due to Australia's ageing population and the increasing prevalence of these conditions.

In Australia, prostheses are accessed via two pathways. In the public health system, patients receive treatment in a public facility, with the cost of prostheses paid for from public health funding. Alternatively, privately insured patients access prostheses through the Prostheses List (PL), which is a list of approved prostheses. Private health insurance (PHI) providers pay a rebate – the minimum benefit payable (MBP) – for the ophthalmic device.[10]

Recent reforms to the PL have reduced the MBP (or price) for ophthalmic devices, with the intention that reducing prostheses expenditure for PHI providers will flow through to reduced premiums, thus increasing PHI coverage and affordability. However, as outlined in Section 4, the reductions in MBPs for ophthalmic devices may not translate into improved PHI coverage or affordability for patients.

Moreover, a reduction in the MBP for ophthalmic devices may lead to worse long-term patient outcomes, with an associated increase in healthcare costs. For example, the lower MBP may limit the ability of prostheses suppliers to develop innovative products and participate in the market. If the rate of products entering the market declines, patients will no longer benefit from newer technologies entering the market. Some of the main benefits for patients include the greater spectacle independence offered by newer, but also more expensive technologies. Future innovation is necessary in the medical devices and prostheses sector as new products often deliver incremental, but important, developments in design or features.

Further, many suppliers provide ancillary services to support clinicians and hospitals in the use of ophthalmic devices. These services encourage greater adoption of newer technologies, but more importantly, they help facilitate improved patient outcomes by optimising the use of ophthalmic devices. A reduction in the MBP may reduce the level of ancillary services offered, which may lead to an associated reduction in patient outcomes.

The PL delivers value to patients by offering them devices which deliver elevated levels of spectacle independence compared to those not on the PL. Additionally, ophthalmic devices on the PL can correct multiple visual acuity deficits simultaneously (e.g. near and far sightedness) while devices not on the PL can only rectify individual conditions.

There are a range of benefits that are delivered to Australian patients, employers and the government through patients being able to access ophthalmic devices through the PL. The key benefit explored in this report is the shorter waiting times for patients accessing cataract surgery through the private sector, compared to patients accessing cataract surgery through the public sector, thus preventing sight loss in some cases and its associated costs. Patients with cataract in

[9] Foreman, J, Keel, S, Xie, J, van Wijngaarden P, Jonathan, C, Taylor, HR, Dirani, M 2016, *The National Eye Health Survey 2016*. Available from: http://www.vision2020australia.org.au/uploads/resource/250/National-Eye-Health-Survey_Full-Report_FINAL.pdf. Accessed December 2018.

[10] A description of how the PL works is provided in Section 2.

the public system wait on average 86 days for treatment, while the waiting time for privately insured patients is significantly shorter (17 days as in section 3.7.2).[11]

Having cataracts imposes a range of costs on the patient, government, businesses, and society, such as out-of-pocket costs for patients, lost productivity, reduced wellbeing, and increased care that is required from family and friends. The longer wait for surgery experienced by patients in the public system means that these costs are experienced for a longer time than for patients in the private system.

In addition to these quantified benefits, there may be other benefits arising from access to devices on the PL, such as increased choice for patients, access to a wider range of prostheses, an improved patient experience of treatment, and potentially better clinical outcomes (from access to a broader range of devices). To assist with illustrating these likely benefits, the report draws on insights from patient interviews who had accessed treatment for cataract and glaucoma in the public and private systems.

The remainder of this report is outlined as follows:

- **Chapter 2** provides an overview of the PL, discusses specific ophthalmic devices that are available on the PL, and provides an overview of two of the major ophthalmic conditions affected by changes to the PL.
- **Chapter 3** quantifies the economic burden imposed on public patients as they wait for ophthalmic surgery, compared to privately insured patients accessing treatment through a private facility. This includes an analysis of the cost savings to government by patients accessing ophthalmic treatment through the private sector.
- **Chapter 4** describes likely patient benefits that were not captured explicitly in the model, and discusses the potential impact of the PL reforms on patients, the ophthalmic devices sector, and PHI providers.
- **Appendix A** presents information on the epidemiology of cataract that was an input to the economic modelling in Chapter 3.

[11] In developing this report, we have calculated the cost burden avoided through reduced waiting time for private cataract surgeries. However, wait times for surgical glaucoma treatment in the public health system are not significant like they are for cataract surgeries – recent data from the Australian Institute of Health and Welfare (AIHW) indicates that the median waiting time for glaucoma surgery (trabeculectomy) is 21 days for public patients. Consequently, the report examines the pathologies and prostheses options for both cataract and glaucoma, but focuses specifically on the economic burden resulting from delayed cataract surgery.

2 Overview of the Prostheses List

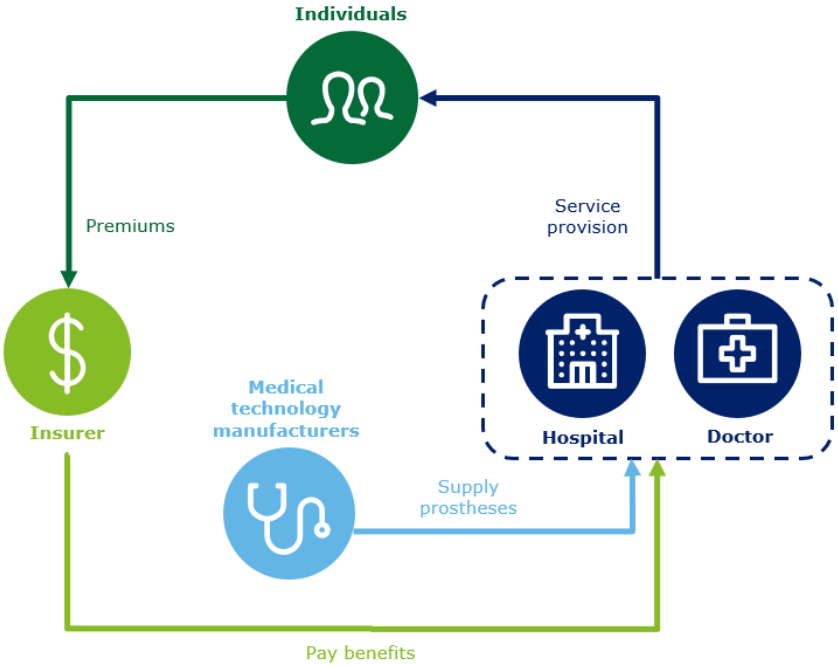
This chapter provides an overview of the PL, explains the interactions between different parties in the prostheses market, discusses specific ophthalmic devices that are available on the PL, and provides an overview of two of the major ophthalmic conditions – cataract and glaucoma – affected by changes to the PL.

2.1 Introduction to the Prostheses List

The PL is the list of surgically implanted prostheses, human tissue items, and other medical devices for which PHI funds must pay benefits to a patient with appropriate coverage, as part of hospital or hospital substitute treatment, where there is a Medicare benefit for the service.[12] Currently, there are in excess of 10,000 prostheses on the List.

A simplified overview of how the supply of prostheses operates is provided in Figure 2.1. An individual who is approved for treatment chooses their doctor/hospital, who purchases the appropriate device from the manufacturer. The patient's PHI provider then pays the MBP to the hospital. The diagram is simplified – for example it does not show payments to manufacturers or out of pocket (PHI excess or gap) payments from individuals to service providers.

Figure 2.1: Prosthesis supply setting (simplified)



Source: Adapted from Deloitte Access Economics (2014).[13]

[12] The *Private Health Insurance (Prostheses) Rules 2018 (No.2)* and the *Private Health Insurance (Prostheses) Rules 2018 (No.3)* (Amendment Rules), within Division 72 of the Private Health Insurance Act 2007, outline the arrangement for the List.

[13] Deloitte Access Economics, 2014, *Economic review of the prostheses listing process. Report for Applied Medical*. Available from: http://competitionpolicyreview.gov.au/files/2015/01/applied_medical_01.pdf. Accessed January 2019.

A patient's private health insurer is required by law to pay the MBP for any prostheses included on the PL, regardless of the price paid by the hospital for the device. The price of prostheses are passed on to consumers through health insurance premiums, and indirectly to government through the PHI rebate. Private hospitals purchase prostheses directly from device manufacturers and often receive rebates or other incentives from manufacturers for buying in bulk or achieving certain volume amounts.[14]

The interactions between each payer in relation to procuring prostheses can vary on a case-by-case basis, and each player has different incentives. Individuals and doctors want the best possible care, and as there is no gap payment for most ophthalmic prostheses, they will tend to choose the prosthesis best suited to the patient's needs, regardless of price. Hospitals have an incentive to keep costs from manufacturers at or below the MBP. Volume rebates and other discounting arrangements between hospitals and suppliers may assist hospitals to keep costs below the MBP.[15]

2.2 Prostheses for cataract and glaucoma

Two of the most common ophthalmic conditions requiring surgical insertion of a prostheses include cataract and glaucoma. A brief overview of each condition is provided, along with surgical treatment options of the condition.

2.2.1 Cataract

A cataract is an eye disease in which a previously clear lens of the eye becomes cloudy or opaque, causing a decrease in vision. The natural lens of the eye focuses light onto the back of the eye (the retina) allowing images to appear clearly and without distortion. The lens is comprised of water and protein, with the protein arranged to let light pass through. A cataract occurs when some of the lens protein clumps together and cloud a portion of the lens. Over time, the cataract may grow larger and cloud more of the lens, causing vision to deteriorate, often requiring frequent changes to spectacles or contact lenses. The most common symptoms of cataract are cloudy or blurry vision; problems with light; colours that seem faded; and double or multiple vision.

There are three types of cataract conditions:

- Cortical – Wedge-shaped, white opacities develop in the lens cortex causing light rays to hit the retina in a scattered fashion and glare issue to occur.
- Nuclear – Sclerosis (gradual clouding) of the nucleus causes the lens to turn yellow and harden resulting in central opacity and visual deterioration.
- Posterior subscapular cataract – Opacities form on the back surface of the lens causing light sensitivity, visual impairment and glare issues.

Although each condition has its own pathology, presents differently and has different risk factors, they can occur simultaneously, and they require the same surgical and management strategies.[16]

---

[14] The Senate Community Affairs Reference Committee. (2017). *Price regulation associated with the Prostheses List* Framework. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/ProsthesesListFramework/Report.

[15] Deloitte Access Economics, 2014, *Economic review of the prostheses listing process. Report for Applied Medical*. Available from: http://competitionpolicyreview.gov.au/files/2015/01/applied_medical_01.pdf. Accessed January 2019.

[16] Though the precise cause of cataract are unknown, some factors increase the risk of contraction:

- Age-related cataract: Most cataracts are attributable to ageing;
- Congenital cataract: Infants can be born with cataracts or develop them during the course of childhood because of hereditary enzyme defects, other genetic diseases, or systemic congenital infections;
- Secondary cataract: Certain health issues or lifestyle behaviours, such as diabetes, smoking, and steroid use are believed to be linked to cataracts; and,
- Traumatic cataract: Severe trauma to the eye, eye surgery for other issues, or intraocular inflammation can also cause cataracts to develop.

The primary method for detecting cataract is through eye examinations, which include a visual acuity test (eye chart test), contrast sensitivity test, and/or a pupil dilation test. However, there is no official measure of the

For a cataract in its initial stages, different spectacles, magnifying lenses, or stronger lighting may assist with experienced vision difficulties. Worsening vision and heightened patient concern (for example, impediments to daily activities) may necessitate surgery to improve vision. Modern cataract surgery is a highly effective and cost efficient procedure with a low risk of complication. The procedure involves the surgical removal of the cloudy lens and the implantation of an artificial intraocular lens (IOL). There are three types of cataract surgery:

- Phacoemulsification: A small incision is made in the cornea (or near its border with the sclera). A small, vibrating probe is inserted into the lens to break it up into smaller pieces, which are then gently suctioned away. Finally, the lens is replaced with an IOL.
- Extracapsular cataract extraction: An incision is made in the cornea or near its border with the sclera. The lens is removed from the lens capsule and replaced with an IOL.
- Intracapsular extraction: The whole lens and capsule are removed and replaced with an IOL.

Additionally, viscoelastic substances help maintain a stable anterior chamber depth and protect the corneal endothelium (cells that line the posterior surface of the cornea and face the anterior chamber of the eye) during surgery.[17] However, the use of such substances can result in elevated postoperative eye pressure (intraocular pressure).

The PL contains a number of different types of intraocular lenses (IOL), which are used in the treatment of cataract. The latest List (August 2018) contains 220 IOLs, and 12 unique product groups and sub-groups. The MBPs for the product groups are shown in Table 2.1. The main classes of IOLs include:

- Monofocal IOLs: These provide patients with a set focal point, usually for distance vision.
- Aspheric IOLs: Lenses that match the shape and optical quality of the eye's natural lens (which is aspheric), and thereby can provide sharper vision — especially in low light and for people with large pupils.
- Toric IOLs: These correct astigmatism, near sightedness or far sightedness. They have alignment markings on the peripheral part of the lens that enable a surgeon to adjust the orientation of the IOL.[18]
- Accommodating IOLs: Presbyopia-correcting lenses that expand the range of clear vision with both an aspheric design and flexible "haptics" — the supporting legs that hold the IOL in place inside the eye.
- Multifocal IOLs: Presbyopia-correcting lenses that contain added magnification in different parts of the lens to expand your range of vision to see objects clearly at all distances without glasses or contact lenses.

effect of cataract on visual status or functional ability, nor is there a threshold to determine whether a patient requires surgery.

[17] Higashide, T and Sugiyama, K 2008, 'Use of viscoelastic substance in ophthalmic surgery – focus on sodium hyaluronate', *Clinical Ophthalmology*, 2(1):21-30.

[18] There are also toric multifocal lenses which share features of both toric and multifocal IOLs.

Table 2.1: Listed benefits for IOLs listed on the PL, August 2018

Assessment body	Product group	Product subgroup	Average listed benefit ($)
Anterior chamber IOLs	Aphakic	Rigid	173
Anterior chamber IOLs	Phakic	Rigid	862
Anterior chamber IOLs	Phakic	Foldable	618
Posterior chamber IOLs	Rigid		133
Posterior chamber IOLs	Foldable	Microincision	410
Posterior chamber IOLs	Foldable	No edge modification	232
Posterior chamber IOLs	Foldable	Edge modification	473
Posterior chamber IOLs	Foldable	Presbyopia correcting	861
Posterior chamber IOLs	Foldable	Accommodative	642
Posterior chamber IOLs	Pseudo-phakic, piggy-back	Monofocal	522
Posterior chamber IOLs	Pseudo-phakic, piggy-back	Multifocal	841

Source: Australian Government Department of Health (2018).[19]

2.2.2 Glaucoma

Glaucoma refers to a characteristic pattern of damage to the optic nerve. The optic nerve is comprised of over a million nerve fibres connecting the retina and brain. Clear fluid (*aqueous humour*) is in continuous circulation within the space at the front of the eye, the anterior chamber, before draining from the chamber in front of where the iris and cornea meet. When the fluid reaches a certain angle, it exits from the spongy, drain-like meshwork (trabecular meshwork) through a set of circular lymphatic-like tubes (Schlemm's canal) that flow into the blood system. Glaucoma occurs when there are issues with intraocular pressure due to an imbalance of fluid production and drainage.[20]

There are three primary surgical procedures used to treat glaucoma.

[19] Australian Government Department of Health, 2018, *The Prostheses List*. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-privatehealth-prostheseslist.htm. Accessed December 2018.

[20] There are several types of glaucoma:

- Primary open-angle glaucoma – When the fluid drains from the anterior chamber too slowly, causing a build-up of intraocular pressure (ocular hypertension)
- Low-tension/normal-tension glaucoma - an also occur for people with low or even regular level of intraocular pressure
- Narrow/angle-closure glaucoma: The iris traps fluid in the eye causing an increase in intraocular pressure
- Childhood glaucoma: A rare form of glaucoma caused by an abnormal drainage system
- Secondary glaucoma: Trauma-related, pigmentary, uveitic, rubeotic and others.

Like cataract, the precise cause of glaucoma remains unclear, but there are identifiable risk factors that increase the likelihood of contraction, such older age, family history and ethnicity, central thinning of the cornea, short/long sightedness, steroid usage or eye trauma.

The methods for diagnosing glaucoma are also similar to those of cataract. Methods include a visual acuity test or a visual field test to measure peripheral vision. Additional diagnostic techniques include a tonometry to measure intraocular pressure, a pachymetry to measure corneal thickness, a gonioscopy to identify a blockage in the mesh and distinguish between open-angle and closed-angle glaucoma, and an optical coherence tomography to scan the optic nerve head.

- Minimally invasive glaucoma surgery (MIGS) – entails the use of micro implants to allow aqueous humour to flow through the trabecular meshwork or the Schlemm's canal to reduce intraocular pressure.
- Trabeculectomy – If a patient cannot undergo MIGS, they may have a trabeculectomy; an incision made in the eye creates a new path for fluid to leave the eye.
- Tube-shunt/Seton glaucoma surgery – If a trabeculectomy fails, a tube-shunt surgery can occur where a flexible, plastic tube with a silicone drainage pocket is inserted in the eye.

The PL contains 12 glaucoma devices, which are classified into ab interno (inside eye) devices, and ab externo (outside eye). The average listed benefit (ignoring market size) of ab interno devices and ab externo devices on the PL was $1,368 and $498, respectively, at August 2018.[21]

2.3 Reform to ophthalmic devices listed on the Prostheses List

The PL was introduced as a measure to stabilise previously poorly controlled growth in private sector health payments and reduce public hospital waiting lists for procedures involving prostheses.[22] The Government and private health insurers have recently noted that the price of prostheses on the PL has contributed to rising health insurance premiums, although this is due to the rising utilisation of prostheses (due to an ageing population and greater prevalence of chronic disease), rather than price changes.[23]

In February 2016, the Department of Health established the Industry Working Group on PHI Prostheses Reform (the 'Working Group') with the purpose of examining opportunities for reform of the arrangements governing prostheses and devices access in the PHI sector.

The Working Group considered evidence from a range of sources, including advice the Chair of the Working Group and the Department of Health provided surrounding commercial-in-confidence data. The Working Group identified that the MBP for some devices were considerably higher than in the Australian public hospital system and internationally, and that there was an "opportunity to consider a material reduction in benefits for certain items, and therefore for reductions in PHI outlays" (p.3).[24]

The Working Group found that IOLs were one of the devices that appeared to have the largest price-benefit differential between the listed benefit, and available domestic and international market prices, and they recommended that Government may wish to consider IOLs (along with cardiac, hip and knee devices) as an initial target for any benefit reductions. In part, IOLs were considered because of the large volumes and benefits, with relatively high levels of competition among prostheses sponsors. However, while the prices were compared for "certain items", the Working Group does not make it clear whether the Chair of the Working Group and the Department of Health considered a consistent set of products when making the recommendations.[25]

In October 2017, the Commonwealth Government announced reforms to PHI, including lowering the MBP for all implanted medical devices from February 2018 (see Table 2.2). These reforms also included annual benefit reductions of between 1% and 10% for IOLs, viscoelastic tools and all other ophthalmic devices in each of the years up until 2020. The lowered benefits come in addition to a 10% reduction in the minimum IOL benefits introduced in February 2017.

---

[21] Australian Government Department of Health, 2018, *The Prostheses List*. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-privatehealth-prostheseslist.htm. Accessed December 2018.
[22] The Senate Community Affairs Reference Committee. (2017). *Price regulation associated with the Prostheses List* Framework. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/ProsthesesListFramework/Report. Accessed January 2019.
[23] Ibid.
[24] Industry Working Group on Private Health Insurance Prostheses Reform 2016. Industry Working Group on Private Health Insurance Prostheses Reform Final Report. Available from http://www.health.gov.au/internet/main/publishing.nsf/content/iwg-phi-pros-ref. Accessed January 2019.
[25] Ibid.

Table 2.2: Changes to the MBP for ophthalmic devices

Assessment Group	1 Feb 2018 (reduction since Aug 2017)	1 Aug 2018 (reduction since Feb 2018)	Total reductions in 2017-18
Foldable	6.8%	1.82%	8.5%
Viscoelastic	8.0%	2.17%	10.0%
All other benefits	4.0%	1.04%	5.0%

Source: Australian Government Department of Health (2018).[26]

The intended policy outcomes of the reforms was to reduce expenditure on prostheses by PHI companies and thus place downwards pressure on future increases to PHI premiums. The Department of Health has indicated that every $200 million reduction in benefits for prostheses should reduce premiums by 1% (or thereabouts).[27] It has been noted that premiums will not actually decline, but that premiums will not rise as quickly as they otherwise would have.[28] The potential implications of these reforms are discussed further in Section 4.2.

[26] Australian Government Department of Health, 2018, *Private health insurance reforms: Prostheses List benefit reductions*. Available at http://www.health.gov.au/internet/main/publishing.nsf/Content/private-health-insurance-reforms-fact-sheet-prostheses-list-benefit-reductions. Accessed January 2019.
[27] Private Healthcare Australia, 2015, *Costing an arm and a leg: Making healthcare more affordable and accessible for Australians*. Available at https://www.privatehealthcareaustralia.org.au/wp-content/uploads/PHA-Report-Costing-an-arm-and-a-leg-Oct-2015.pdf. Accessed January 2019.
Australian Government Department of Health, 2018, *Private health insurance reforms: Prostheses List benefit reductions*. Available at http://www.health.gov.au/internet/main/publishing.nsf/Content/private-health-insurance-reforms-fact-sheet-prostheses-list-benefit-reductions. Accessed January 2019.
[28] The Senate Community Affairs Reference Committee. (2017). *Price regulation associated with the Prostheses List* Framework. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/ProsthesesListFramework/Report. Accessed January 2019.

3 Costs of cataract and value of the Prostheses List

This chapter describes the approach taken to estimate the costs of cataract in Australia, and subsequently the value of the PL to different payers (individuals, governments and other parts of society).

The chapter provides an overview of the approach to estimate the costs of cataract, but also clarifies some of the main differences between the public and private systems, largely in terms of the waiting period patient's experience. The difference in waiting time then informs part of the value of the PL to patients (as quantified in section 3.7). Specific methodologies for each of the costs associated with cataract are outlined further in the section where they are discussed.

Additionally, in calculating the costs of cataract – a disease with a significant prevalence in Australia, this section also highlights the value of the PL to those with all conditions for which devices are offered on the PL.

3.1 Methodology to estimate the costs of cataract

The approach employed in this section calculates the costs that arise from cataract requiring surgical treatment, including the cost of vision loss that can occur as a result of the condition. Previous Deloitte Access Economic reports have focused on the prevalence and costs of cataract-related visual impairment, however, this report takes the approach of calculating the financial and wellbeing costs of cataract in isolation.

The costs of cataract were estimated for the year 2017-18 using a prevalence approach to cost estimation. A prevalence approach measures the number of people with cataract at a point in time, and estimates the costs incurred due to cataract for a given year (e.g. 2017-18).

The broad types of costs associated with cataract included in this report are:[29]

- **financial costs to the Australian health system** include the costs of running hospitals and residential aged care facilities, general practitioner and specialist services reimbursed through Medicare and private funds, the cost of pharmaceuticals and of over-the-counter medications, allied health services, research and other health system expenditures (such as health administration).
- **productivity costs** which include reduced workforce participation, reduced productivity at work, loss of future earnings due to premature mortality, and the value of informal care (lost income of carers).
- **transfer and other costs** comprise the deadweight losses (DWL), or reduced economic efficiency, associated with the need to raise additional taxation to fund provision of government services and the brought forward funeral costs due to premature mortality.
- **wellbeing costs** which are the costs associated with reduced quality of life and premature death that result from cataract, measured in terms of the years of life (or healthy life) lost using the burden of disease methodology.

[29] Cost of illness methodology would typically include administrative costs and other financial costs associated with government and non-government programs such as respite programs, community palliative care, and any out-of-pocket expenses – e.g. formal care, and transport and accommodation costs associated with receiving treatment. These costs were excluded from the scope of the report as it was expected the costs would be relatively minor.

Different costs of disease are borne by different individuals or sectors of society. Understanding how the costs are shared helps to make informed decisions regarding interventions. While people with cataract are most severely affected by the condition, other family members and society also face costs as a result of cataract.

From the perspective of employers, depending on the impact of cataract, reduced workforce participation or absenteeism will lead to costs such as higher wages (that is, accessing skilled replacement short term labour) or alternatively lost production, idle assets and other non-wage costs. Employers might also face costs such as rehiring and retraining due to premature mortality.

Australian governments typically bear costs associated with the health system and community services (noting there are also out of pocket expenditures and other payers), although in reality taxpayers (society) pay for these services through taxes. The analysis in this report shows the first round impacts on government and employers. No second round or longer term dynamic impacts are modelled (i.e. changes in wages or labour market outcomes associated with the economic burden of cataract).

Any future costs ascribed to cataract for the year 2017-18 were estimated in net present value terms to reflect the value of utility today rather than in the future. Taking inflation, risk and positive time preference into consideration, a real discount rate of 3% is traditionally used in discounting healthy life, and is also used in discounting other cost streams in this report, for consistency.[30]

It is possible to estimate each of these costs using a top down or bottom up approach. The top down approach provides the total costs of a program element (e.g. the health system). A bottom up approach provides estimates of the number of cases incurring each cost, along with the average cost. The product is the total cost. A top down approach using national datasets can be more desirable to ensure that the sum of parts is not greater than the whole.

In this report, the bottom up approach has been used to estimate health system costs, which was then validated with other estimates where sufficient data were available. A bottom up approach was used to estimate productivity losses, other financial costs and loss of wellbeing due to cataract in Australia.

3.1 Health system expenditure

Cataract is the second leading cause of visual impairment and blindness of all major eye diseases in Australia, and as such, incurs significant public and private healthcare costs each year. These healthcare costs are comprised of:

- Hospital admission – costs associated with cataract surgery, including administrative expenses, clinical salaries, operating room booking, prostheses used in surgery, etc.
- Out-of-hospital – consultations with an ophthalmologist prior to, and after, surgery
- Aged care – the cost of caring for those 65 years and older who suffer from cataract-related visual impairment
- Other professionals – consultations with an optometrist prior to, and after, surgery
- Pharmaceuticals – medications used to treat cataract prior to, and after, surgery
- Research – funding allocated for research into the causes of, and new treatments for, cataract.

[30] Generally, the minimum option that one can adopt in discounting expected healthy life streams is to set values on the basis of a risk free assessment about the future that assumes future flows would be similar to the almost certain flows attaching to a long-term Government bond. Another factor to consider is inflation (price increases), so that a real rather than nominal discount rate is used. If there is no positive time preference, the real long term government bond yield indicates that individuals will be indifferent between having something now and in the future. In general, however, people prefer immediacy, and there are different levels of risk and different rates of price increases across different cost streams.

3.1.1 Cost of separations

In 2017-18, an approximated 74,424 cataract surgeries were performed through Australia's public health system. With an average cost of $2,815 per separation[31], the total annual public cost of cataract surgery was an estimated $216.5 million.[32]

In the same year, approximately 177,946 cataract surgeries were performed through the private health system (80,566 overnight facilities and 97,380 day hospitals). The average cost of a separation for private patients was $2,648 and $2,305 for overnight facilities and day hospitals respectively, for a total cost of $437.8 million.[33]

These separations are disaggregated by age, gender and location in Tables 3.1 and 3.2.

Table 3.1: Estimated cataract separations by age and gender, 2017-18

Age	Male	Female	Total
0-4	37	28	65
5-9	47	26	73
10-14	29	15	44
15-19	46	43	90
20-24	91	51	143
25-29	124	128	252
30-34	151	121	272
35-39	271	227	498
40-44	508	518	1,025
45-49	1,368	1,433	2,802
50-54	2,883	3,350	6,233
55-59	5,553	6,871	12,423
60-64	10,193	13,121	23,314
65-69	17,756	23,446	41,202
70-74	24,580	32,160	56,739
75-79	23,556	30,194	53,750
80-84	16,387	19,534	35,921
85-89	5,668	5,945	11,613
90+	3,408	4,987	8,394
Total	**112,656**	**142,198**	**254,854**

[31] The cost per public separation was calculated by applying inflation to the Independent Hospital Pricing Authority's average cost of public lens procedures (AR-DRG: C16Z) in the National Health Cost Data Collection 2015-16.

[32] Independent Hospital Pricing Authority 2018, National Hospital Cost Data Collection Cost Report: Round 20 Financial Year 2015-16. Sydney: IHPA.
Australian Institute of Health and Welfare (AIHW), 2018, Admitted patient care 2016–17: Australian hospital statistics. Cat. No. HSE 201.

[33] Private Hospital Data Bureau, 2018, *Private Hospital Data Bureau (PHDB) Annual Reports*. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-data-collections-publications-PHDBAnnualReports. Accessed December 2018.

Source: Private Hospital Data Bureau (2018), Independent Hospital Pricing Authority (2018), AIHW (2018) and Deloitte Access Economics calculations.[34]

Table 3.2: Estimated cataract surgery separations by state/territory, 2017-18

Separation type	NSW	VIC	QLD	WA	SA	TAS	ACT	NT
Public separations	22,041	21,102	12,165	10,823	5,666	1,468	2,389	1,805
Private separations	56,676	40,962	43,131	16,929	11,503	4,649	2,486	1,060
Total	**78,717**	**62,064**	**55,296**	**27,753**	**17,169**	**6,117**	**4,875**	**2,864**

Source: AIHW (2018) and Deloitte Access Economics calculations.[35]

Comparatively, there were approximately 153,650 other ophthalmic surgeries performed in 2017-18 (39,246 public and 114,404 private procedures) with an estimated total cost of $289.1 million.[36] Glaucoma accounted for approximately 11,877 procedures, at an estimated cost of $36.7 million. The other ophthalmic surgeries are largely retinal or eyelid procedures.

Given the relevance of the PL to the broader context of the report, it is also necessary to estimate the cost of prostheses used in the private and public sector. The cost is not additional to the costs of surgery, but rather it is included within the total cost. In 2017-18, the average cost of cataract surgery prostheses used in the public system was $296.[37] Similarly, for the same procedure, insurers paid an average of $659 for a prosthesis.[38] The total cost of cataract prostheses was an estimated $22 million and $113.4 million for public and private patients respectively in 2017-18. The difference in costs reflects the more comprehensive list of devices that private patients have access to.

3.1.2 Out-of-hospital and other professional costs

To be approved for cataract surgery, a patient must attend a consultation with an optometrist who will determine the presence and severity of cataract. Following this, the patient can be referred to an ophthalmologist for a pre-operative consultation. The cost of these consultations is $69[39] and $86[40] respectively. These consultations were estimated to have cost $17.0 million and $21.8 million respectively in 2017-18.

[34] Private Hospital Data Bureau, 2018, *Private Hospital Data Bureau (PHDB) Annual Reports*. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-data-collections-publications-PHDBAnnualReports. Accessed December 2018.
Independent Hospital Pricing Authority 2018, National Hospital Cost Data Collection Cost Report: Round 20 Financial Year 2015-16. Sydney: IHPA.
Australian Institute of Health and Welfare 2018, *Australian refined diagnosis-related groups (AR-DRG) data cubes*. Available from: https://www.aihw.gov.au/reports/hospitals/ar-drg-data-cubes/contents/data-cubes. Accessed December 2018.
[35] Australian Institute of Health and Welfare (AIHW), 2018, Admitted patient care 2016–17: Australian hospital statistics. Cat. No. HSE 201.
[36] Private Hospital Data Bureau, 2018, *Private Hospital Data Bureau (PHDB) Annual Reports*. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-data-collections-publications-PHDBAnnualReports. Accessed December 2018.
Independent Hospital Pricing Authority 2018, National Hospital Cost Data Collection Cost Report: Round 20 Financial Year 2015-16. Sydney: IHPA.
[37] Independent Hospital Pricing Authority 2018, National Hospital Cost Data Collection Cost Report: Round 20 Financial Year 2015-16. Sydney: IHPA.
[38] Private Hospital Data Bureau, 2018, *Private Hospital Data Bureau (PHDB) Annual Reports*. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-casemix-data-collections-publications-PHDBAnnualReports. Accessed December 2018.
[39] Medicare Benefits Schedule (MBS), A.10 Optometrical services, 1. General, Item no. 10910/10911: Comprehensive initial consultation
[40] MBS, A.3 Specialist attendances to which no other item applies, Item no. 104: Professional attendance at consulting rooms or hospital by a specialist in the practice of his or her specialty after referral of the patient to him or her-each attendance, other than a second or subsequent attendance

Furthermore, a cataract patient will have at least one post-operative consultation with an ophthalmologist to assess the outcome of the surgery. At $43 per consultation[41], these follow-ups are estimated to have cost $11.0 million in 2017-18. Following this, a patient will typically undergo another vision test from an optometrist to identify likely changes in vision that have resulted from surgery – also at $69 per consultation.[42] This was estimated to cost an additional $17.0 million.

The estimated consultation costs are likely to be conservative for a number of reasons:

- Early stage cataract is likely to have a wait and see treatment strategy, which may include another review with an optometrist to confirm that cataract is present.
- Similarly, the ophthalmologist may want to see how the cataract progresses before surgery occurs. Thus, there is likely to be more than one consultation before surgery.
- Finally, there may be a number of people with early stage cataract that have a consultation, but do not proceed to surgery, at least until the condition worsens.

While surgery can significantly improve a patient's vision, some patients will still rely on prescription glasses following surgery, especially those with long-sightedness (hyperopia). Spectacle independence is highly dependent on the type of ophthalmic device used in the surgery (see Table 3.3).

Table 3.3: Spectacle independence following cataract surgery

Type of IOL	Average glasses independence (%)
Multifocal	83
Toric	73
Toric multifocal	85
Accommodative	45
Monofocal	12
Simple average	**41**

Source: Zvorničanin and Zvorničanin (2018), Wang et al (2017).[43] Note: a simple average was used as there is an absence of available data on IOL usage in Australia.

Due to an absence of available data on IOL usage, it was assumed that 41% of cataract surgery patients continued to depend on, and required new prescription glasses following cataract surgery. At a unit price of $150 per pair of multifocal spectacles[44], the total cost of new prescription glasses was estimated to be $15.7 million in 2017-18.

3.1.3 Pharmaceuticals

In the period after cataract surgery, patients are required to use a combination of antibiotic and anti-inflammatory eye drops to reduce the risk of infection and minimise inflammation.[45] A single

[41] MBS, A.3 Specialist attendances to which no other item applies, Item no. 105: Professional attendance by a specialist in the practice of his or her specialty following referral of the patient to him or her-an attendance after the first in a single course of treatment
[42] As there is no available MBS item for a follow up consultation with an optometrist, the price of an initial consult (MBS Item no. 101910/10911) was used as a proxy.
[43] Zvorničanin, J and Zvorničanin E 2018, 'Premium intraocular lenses: The past, present and future', *Journal of Current Ophthalmology,* 30(4):287-296.
Wang, SY, Stem, MS, Oren, G, Shtein, R, Lichter, PR 2017, 'Patient-centered and visual quality outcomes of premium cataract surgery: a systematic review', *European Journal of Ophthalmology, 27*(4):387-401.
[44] Specsavers 2018, *Types of Prescription Lenses*, https://www.specsavers.com.au/glasses/lens-options, accessed 8 January 2019.
[45] Kent, C 2015, *Antibiotics & Cataract Surgery: New Frontiers,* Review of Ophthalmology, https://www.reviewofophthalmology.com/article/antibiotics--cataract-surgery-new-frontiers, accessed 18 January 2018.

course of antibiotic eye drops costs approximately $7.50[46], and a course of anti-inflammatory drops costs approximately $14.70[47], which when applied to 254,854 separations, results in an estimated cost of $5.7 million in 2017-18.

3.1.4 Research costs

Over the last decade, there has been a decrease in the number of grants offered for cataract medical research by the Australian Government's National Health and Medical Research Council, though the funding for remaining research activities has increased. Taking an uninflated, simple average of the total funding and the number of grants awarded by the National Health and Medical Research Council between 2010-2014[48], it is estimated that 8 cataract research grants were awarded in 2017-18 at a total cost of $1.4 million.

3.1.5 Aged care

The likelihood of being admitted to an aged care facility is increased given the presence of vision loss from cataract. Leveraging data from the Blue Mountains Eye Study, Wang et al (2003) calculated the relative risk of admission to an aged care facility for a person with visual impairment to be 1.8.[49]

Consequently, it is necessary to include the costs of the increased need for aged care due to cataract. These costs are comprised of public expenditure on residential care and home care services. Access Economics (2004) found that aged care accounted for 5.5% of total health system spending on cataract based on data obtained from the AIHW through a special request. To estimate the costs of aged care due to cataract, it was assumed that aged care costs related to cataract would still account for 5.5% of total health spending today. The total health system costs, excluding aged care, were an estimated $751.7 million (section 3.1.7), so for aged care costs to represent 5.5% of the total, they would be approximately $43.7 million in 2017-18[50].

3.1.6 Falls and depression

Annually, there are number of falls that are directly attributable to cataract which incur considerable healthcare costs. The elderly have a higher risk of experiencing a fall which often amount to significant physical injuries (e.g. fractures) and additional health expenditures, such as surgery and rehabilitation costs. Many studies have examined the factors underlying increased propensity to fall in the elderly and several have found a significant link between falls and sight loss.

For example, Coleman et al (2004) reported that women with declining visual acuity had a significantly elevated risk (1.85-2.08 odds) of experiencing a fall.[51] In a review of 31 studies on the risks and types of injuries associated with sight loss, Legood et al (2002) conclude that those with sight loss are 1.7 times more likely to have a fall and 1.9 times more likely to have multiple falls. Legood et al (2002) also indicate that the odds of a hip fracture are 1.3-1.9 times greater for those with sight loss.[52]

Health care system expenditure due to injury relating to sight loss and blindness was estimated using the methodology presented in Scuffham et al (2002), a study developed to find costs and

---

[46] Chemist Warehouse 2018a, *Chlorsig Eye Drops 0.5% 10mL,* https://www.chemistwarehouse.com.au/buy/20150/chlorsig-eye-drops-0-5-10ml, accessed 18 January 2018.
[47] Chemist Warehouse 2018b, *Voltaren 1mg/1mL Eye Drops 5mL,* https://www.chemistwarehouse.com.au/buy/61932/voltaren-1mg-1ml-eye-drops-5ml, accessed 18 January 2018.
[48] There is no available information about National Health and Medical Research Council grant funding after 2014.
[49] Wang, J. J., Mitchell, P., Cumming, R. G., & Smith, W. (2003). Visual impairment and nursing home placement in older Australians: the Blue Mountains Eye Study. *Ophthalmic epidemiology, 10*(1), 3-13.
[50] $43.7 = 751.7/(1-0.055) – 751.7.
[51] Coleman, A. L., Stone, K., Ewing, S. K., Nevitt, M., Cummings, S., Cauley, J. A., ... & Mangione, C. M. (2004). Higher risk of multiple falls among elderly women who lose visual acuity. *Ophthalmology, 111*(5), 857-862.
[52] Legood, R., Scuffham, P., & Cryer, C. (2002). Are we blind to injuries in the visually impaired? A review of the literature. *Injury prevention, 8*(2), 155-160.

incidence of conditions associated with sight loss and blindness in the United Kingdom.[53] Within their study the cost of conditions attributable to sight loss are estimated by assuming that people with sight loss would have the same rate of the condition as people with no sight loss if their sight was corrected. The same assumption was made within this study.

To record 'external cause', ICD-10[54] codes are used. There are 19 diagnostic codes assigned to alternative types of falls for example, slipping, tripping or tumbling, or falling from a bed or chair. However not all of the diagnosis codes are attributable to sight loss and blindness, so those that are likely not to be the result of sight loss and blindness were omitted.[55]

To calculate the total cost associated with falls (for all people not just those with sight loss), a weighted average cost for separations was derived from the Independent Hospital Pricing Authority's (2018) National Hospital Cost Data Collection; the weighted average cost was $11,435. A similar approach was taken to derive the average cost of care for a case of depression, which was an estimated $2,125 per case.[56]

Using the model developed by Scuffham et al (2002), an estimated 385 people experienced falls related to cataract, incurring health care costs of $4.4 million in 2017-18.

Likewise, those with poor visual acuity from cataract are 1.45 times more likely to experience depression.[57] In a sample of Australian patients awaiting cataract surgery, 28.5% reported depressive symptoms, which is considerably higher than it is in the general population (8.9%).[58] Using the model developed by Scuffham et al (2002), an estimated 1,588 people with cataract experienced depression, and the estimated cost of depression due to visual impairment from cataract was $3.4 million in 2017-18.

3.1.7 Summary of health system expenditure for cataract

Overall, the total health costs of cataract was estimated to be $795.4 million in Australia in 2017-18, or $3,121 per cataract surgery (Table 3.4). Largely, these costs are borne in private hospitals, owing to the large number of private hospital separations. Governments bore an estimated $429.9 million in costs, followed by private health insurers and other payers ($275.1 million) and individuals and their families ($90.5 million). The costs were allocated to payers using a range of sources.

---

[53] Scuffham, PA, Legood, R, Wilson ECF, and Kennedy-Martin, T 2002, 'The incidence and cost of injurious falls associated with partial sight and blindness in the UK', *Partial sight and blindness Research, 4*(1):1-14.

[54] International Statistical Classification of Diseases and Related Health Problems, 10th Revision.

[55] Categories omitted include: W00 Fall on same level involving ice and snow, W02 Fall involving ice-skates skis roller-skates or skateboards, W03 Other fall same level due collision/pushing by another person, W04 Fall while being carried or supported by other persons, W05 Fall involving wheelchair W06 Fall involving bed W07 Fall involving chair W08 Fall involving other furniture W09 Fall involving playground equipment, W11 Fall on and from ladder, W12 Fall on and from scaffolding, W13 Fall from out of or through building or structure, W14 Fall from tree, W15 Fall from cliff, W16 Diving/jumping into water causing injury other than drowning or submersion.

[56] In 2015-16, Australia spent $9 billion on mental health, and the prevalence of mental and behavioural disorders is approximately 17.5%, or 4.2 million people. Assuming that the costs of depression are similar to all mental and behavioural disorders, the average cost per case is an estimated $2,125 (=$9 billion/4.2 million). See:
Australian Institute of Health and Welfare (AIHW) 2018, *Mental health services in Australia*, https://www.aihw.gov.au/reports/mental-health-services/mental-health-services-in-australia/report-contents/expenditure-on-mental-health-related-services, accessed 15 December 2018.
Independent Hospital Pricing Authority 2018, National Hospital Cost Data Collection Cost Report: Round 20 Financial Year 2015-16. Sydney: IHPA.

[57] Freeman, EE, Gresset, J, Djafari, F, Aubin, MJ, Couture, S, Bruen, R, Lahorte, A and Boisjoly, H 2009, 'Cataract-related vision loss and depression in a cohort of patients awaiting cataract surgery', *Canadian Journal of Ophthalmology,* 44(2):171-176.

[58] Palagyi, A., Rogers, K., Meuleners, L., McCluskey, P., White, A., Ng, J. Q., ... & Keay, L. (2016). Depressive symptoms in older adults awaiting cataract surgery. *Clinical & experimental ophthalmology, 44*(9), 789-796.
Australian Bureau of Statistics 2018, *National Health Survey: First Results, 2017-18*. Cat. No. 4364.0.55.001. Available from:
http://www.abs.gov.au/ausstats/abs@.nsf/PrimaryMainFeatures/4364.0.55.001?OpenDocument. Accessed January 2019.

- Data from the AIHW (2018) show that governments, individuals and other parties pay for 31%, 12%, and 58% of total private hospital costs, respectively.[59] Similarly, the same data show that governments, individuals and other parties pay for 92%, 3%, and 6% of total public hospital costs, respectively.[60] The same data show that government bore 88% of PBS-related pharmaceutical costs. These proportions were combined with the total spending on private and public hospitals, and pharmaceuticals to estimate the costs each payer bears.
- For ophthalmologists, it was assumed that government would reimburse $37 for each consultation, and that patients would bear the remaining costs. Conversely, government funds almost all optometrist appointments through bulk-billed appointments.
- Given spectacles are covered under a broad range of health insurance policies, it was assumed that the PHI coverage rate could be used as a proxy to estimate costs for individuals and insurers.
- Data from the Aged Care Financing Authority (2018) show that government bore approximately 69% of aged care costs, while individuals fund 27% and other revenue sources (e.g. interest) fund the remaining 4%.[61]
- Finally, as the National Health and Medicare Research Council administers government grants for research funding, government bears all of the identified research costs.

Table 3.4: Summary of health system costs of cataract, 2017-18

Component	Individuals/families	Government	Other	Total ($m)
Public hospital	5.9	198.2	12.4	216.5
Private hospital	50.4	134.6	252.8	437.8
Out-of-hospital medical costs	13.6	19.1	0.0	32.8
Other health professionals	0.0	34.0	0.0	34.0
Aids	8.0	0.0	7.7	15.7
Pharmaceutical	0.7	5.0	0.0	5.7
Research costs	0.0	1.4	0.0	1.4
Aged care	11.6	30.3	1.7	43.7
Falls and depression	0.2	7.1	0.4	7.8
Total	**90.5**	**429.9**	**275.1**	**795.4**

Source: Deloitte Access Economics calculations.

3.2 Productivity costs

Productivity losses occur as a result of people experiencing cataract-related visual impairment or blindness. Productivity costs to the economy occur when people with cataract take time off work due to their condition (e.g. to have surgery), which is referred to as absenteeism. Similarly, people with cataract may be less productive while they are at work ('presenteeism'), and they may be less likely to participate in the workforce due to their condition. Furthermore, there are

[59] Australian Institute of Health and Welfare 2018, *Health expenditure Australia, 2016-17*. Available from: https://www.aihw.gov.au/getmedia/e8d37b7d-2b52-4662-a85f-01eb176f6844/aihw-hwe-74.pdf.aspx?inline=true. Accessed December 2018.

[60] The portion of total hospital costs each payer bears was used as a proxy of the costs of cataract surgery that each payer would bear, which may be different for other reasons – for example, PHI may cover more of the costs of a cataract surgery than for other private surgeries. Disaggregated data for cataract surgeries were not available at the time of writing this report.

[61] Aged Care Financing Authority 2018, *2018 ACFA Annual Report on Funding and Financing of the Aged Care Sector*. Available from: https://agedcare.health.gov.au/reform/aged-care-financing-authority/2018-acfa-annual-report-on-funding-and-financing-of-the-aged-care-sector. Accessed January 2019.

economic costs associated with the diminished capacity of carers to work while they care for a person with cataract.

While all cataract surgery, regardless of whether it is undertaken through the public or private health systems, incurs productivity costs due to absenteeism, it is only cataract that presents with visual impairment which creates presenteeism costs, reduced participation in the labour force, and premature mortality.[62]

3.2.1 Reduced workforce participation

Cataract can result in reduced employment in the workforce due to it impeding attempts at job-seeking (e.g. difficulty in searching for work or keeping a job due to frequent absences) or by discouraging participation in the labour force altogether. This can lead to substantial productivity losses in the form of lost wages and other individual-specific costs (e.g. reduced social engagement, decline in mental wellbeing, etc.). A scan of relevant literature was conducted to estimate the impact of cataract on workforce participation:

- Vision Australia's 2018 National Employment Survey estimated that 24% of people with visual impairment were unemployed, and a further 27% were underemployed.[63]
- Using data from the Melbourne Visual Impairment Project, Access Economics (2004) estimated the employment rate for people with vision loss aged 40 to 64 years was 27.5% lower than for the general population. After adjusting for differences in age structure of the population, Access Economics (2004) observed the employment rates were 62.0% for the general population and 34.5% for those with sight loss, which is a relative reduction of 44%.[64]
- The ABS records the labour force status of people with and without visual impairment causing disability in Australia. In the 2015 Survey of Disability, Ageing and Carers, approximately 43% of working age people (defined as 15 to 64 years old) with moderate to severe visual impairment are employed compared to 73% of people without visual impairment.[65] Thus, cataract is associated with a 42% relative reduction in employment.

To estimate the costs of reduced employment associated with cataract the relative reduction in employment was derived from the Survey of Disability, Ageing and Carers. The relative reduction was then applied to Australian general population employment rates (ABS, 2018) and average weekly earnings (ABS, 2018) by age and gender.[66] Reduced employment due to visual impairment from cataract cost an estimated $80.9 million in 2017-18.

3.2.2 Absenteeism

Australians living with cataract may be temporarily absent from paid employment due to their condition. Temporary absences, or absenteeism, is measured as the number of days absent from work per year as a result of an individual's condition. A targeted literature review was conducted to estimate the impact of cataract on absenteeism, although no suitable studies were identified.

Despite this, it is plausible that a number of working age people with cataract will take time off work for their surgery. Indeed, in the working age population, an estimated 46,303 surgeries took place in Australia in 2017-18 (section 3.2.1). According to The Royal College of Surgeons of England's cataract surgery recovery tracker (see Table 3.3) – a guide for patients recovering from

---

[62] Although, there is no premature mortality associated with cataract amongst the working age population, and therefore there are no productivity losses from premature mortality (i.e. the loss of a future income stream).
[63] Vision Australia 2018, *Vision Australia's National Employment Survey 2018,* https://participate.visionaustralia.org/2018-employment-survey, accessed 10 November 2018.
[64] Access Economics 2004, *Clear Insight: The Economic Impact and Cost of Vision Loss in Australia*, Report for Centre for Eye Research Australia (CERA), https://www.cera.org.au/wp-content/uploads/2013/12/CERA_clearinsight_overview.pdf, accessed 30 October 2018.
[65] Australian Bureau of Statistics (ABS) 2016, Microdata: Survey of Disability, Ageing and Carers 2015, Cat. No. 4430.0.30.002.
[66] Australian Bureau of Statistics (ABS) 2018, Labour Force, Australia, Detailed, Quarterly, Aug 2018, Cat. No. 6291.0.55.003.
Australian Bureau of Statistics (ABS) 2018, Average Weekly Earnings, Australia, May 2018, Cat. No. 6302.0.

cataract surgery – individuals are typically able to return to employment almost immediately after surgery, provided that they do not perform machine operation or strenuous activity in their work.

Table 3.5: Cataract surgery recovery tracker

Period post-op	Symptoms	Safe activities	Ability to work
1-2 days	Itchy eyes, mild headache, light sensitivity, sharper vision	Moving around house, gentle exercise, read and watch television	Yes
3-7 days	Dry/itchy eyes, poor long-distance sight	Return to normal routine, moderate intensity exercise, return to driving	Yes

Source: Royal College of Surgeons of England (2018).[67]

To estimate the costs of absenteeism, Deloitte Access Economics assumed that each patient would take two days away from work for their surgery (one day for the surgery, and at least one day to recover). Assuming that general population employment rates applied to patients receiving cataract surgery, by age and gender, there were an estimated 43,286 periods of absence, or 86,571 days where individuals were absent from work for cataract surgery in 2017-18.

To estimate the costs of absenteeism associated with cataract the additional days absent from work was then applied to Australian general population average weekly earnings by age and gender. Additional costs were also included for management time associated with the absence from work and the overtime premium to maintain work output.[68] Absenteeism associated with cataract was estimated at $28.3 million in 2017-18.

3.2.3 Presenteeism

Presenteeism refers to reduced productivity while an employee is at work, but with work impairments due to cataract. Presenteeism is measured as the average number of hours per day that an employee loses to reduced performance or impaired function as the result of their condition. Presenteeism is not as easily measured as absenteeism, but has the potential to incur significant costs to employers by reducing the quality and efficiency of work produced by employees.

A targeted literature review was conducted to estimate the impact of cataract on presenteeism. While no appropriate literature was found relating to the precise presenteeism costs of cataract-related visual impairment, Schakel et al (2018) found that such costs can be attributed to presenteeism from visual impairment more generally.[69] However, their data shows that the reduction in efficiency due to visual impairment is not statistically significant, especially when compared to the costs of absenteeism.

Accordingly, cataract-related presenteeism costs have been excluded from the report, which is also in line with other studies.[70]

---

[67] Royal College of Surgeons of England 2018, Recovering from Surgery – Cataract Surgery Recovery Tracker, https://www.rcseng.ac.uk/patient-care/recovering-from-surgery/cataract-surgery/recovery-tracker/, accessed 14 December 2018.

[68] On average, the costs of manager time and the overtime premium increase the cost of absenteeism by 58% compared to average weekly earnings alone.

[69] Schakel, W, van der Aa, HPA, Bode, C, Hulshof, CTJ, van Rens, GHMB and vans Nispen, RMA 2018, 'The Economic Burden of Visual Impairment and Comorbid Fatigue: A Cost-of-Illness Study (From a Societal Perspective)', *Clinical and Epidemiological Research,* 59(9):1916-1923.

[70] Access Economics 2004, *Clear Insight: The Economic Impact and Cost of Vision Loss in Australia*, Report for Centre for Eye Research Australia (CERA), https://www.cera.org.au/wp-content/uploads/2013/12/CERA_clearinsight_overview.pdf, accessed 30 October 2018.
Access Economics 2009, *Clear Focus - The economic impact of vision loss in Australia in 2009,* Report for Vision2020 Australia.

3.3 Informal care costs

Carers are people who provide care to others in need of assistance or support. An informal carer provides this service free of charge and does so outside of the formal care sector. An informal carer will typically be a family member or friend of the person receiving care, and usually lives in the same household as the recipient of care. People can receive informal care from more than one person.

While informal carers are not paid for providing this care, informal care is not free in an economic sense. Time spent caring involves forfeiting time that could have been spent on paid work or undertaking leisure time activities. As such, informal care can be valued as the opportunity cost associated with the loss of economic resources (labour) and the loss in leisure time valued by the carer. To estimate the dollar value of informal care, the opportunity cost method measures the formal sector productivity losses associated with caring, as time devoted to caring responsibilities is time which cannot be spent in the paid workforce.

To estimate the costs of informal care for Australians with cataract, it was necessary to estimate the proportion of people with cataract receiving support from an informal carer, and also the additional hours of care that are provided to Australians with cataract.

The Survey of Disability, Ageing and Carers is the best available source on informal care provision in Australia. The average care requirement for those with cataract requiring care was 35.64 hours, compared to an average care requirement of 16.13 hours in the comparator group (people requiring care, but without disabilities caused by cataract and no known health conditions).[71]

Using these data, it was estimated that 1.6% of people with cataract receive informal care from a primary carer. For people receiving informal care for cataract, it was estimated that an additional 19.5 hours of care is provided each week (1,014 hours annually), which is equivalent to 155,880 hours of care.

Informal carers were assumed to have approximately the same age and gender distribution as the person with cataract. This assumption is important in valuing the carer's opportunity cost of time, which was calculated based on the weighted average weekly earnings (ABS, 2018) and the chance of being employed (ABS, 2018).[72] On average, the opportunity cost of a carer's time was estimated to be $26 per hour. Thus, the total costs of informal care for Australians with cataract was estimated to be $11.0 million in Australia in 2017-18.

3.4 Other financial costs

People experiencing cataract-related visual impairment may require a variety of aids, special equipment and home modifications to function adequately and to enhance their quality of life. Such items include mobility supports, magnifying devices, computer aids, talking appliances, enhanced lighting and grab rails. Based on Access Economics (2009) the cost of aids and equipment for those with cataract-related visual impairment was an estimated $461 per person[73] – this reflects a total cost of $50.6 million in 2017-18.

Cruess AF, Gordon KD, Bellan L, Mitchell, S and Pezzullo L 2011, 'The cost of vision loss in Canada', *Canadian Journal of Ophthalmology*, 46(4):315–18.

[71] As the cohort of patients with cataract would likely require some degree of care due to old age or other factors, analysis needs to consider what level of informal care would be required in the absence of cataract. To capture this background care requirement, the care requirements for people without disabilities due to cataract and no significant health conditions were estimated and used as a comparator group for those with cataract.

[72] Australian Bureau of Statistics (ABS) 2018, Labour Force, Australia, Detailed, Quarterly, Aug 2018, Cat. No. 6291.0.55.003.
Australian Bureau of Statistics (ABS) 2018, Average Weekly Earnings, Australia, May 2018, Cat. No. 6302.0.

[73] The average cost of aids and equipment was $379 per person with vision impairment in 2009, or $461 in 2017-18 dollars. The total cost of aids and modifications for cataract-related visual impairment was estimated by applying the average cost per person to the number of people with vision impairment from cataract in 2018. See:
Access Economics 2009, *Clear Focus - The economic impact of vision loss in Australia in 2009,* Report for Vision2020 Australia.

There are also brought-forward funeral costs due to premature mortality from cataract-related visual impairment. As outlined in Appendix A, an estimated 222 deaths in 2017-18 were due to cataract-related visual impairment. Because these deaths occurred earlier than they otherwise would have, the cost of a funeral is brought-forward to today, with associated costs of $0.4 million.

3.5 Deadweight losses

DWL refer to the costs of administering welfare pensions and raising additional taxation revenues. It is the loss of consumer and producer surplus, as a result of the imposition of a distortion to the equilibrium (society preferred) level of output and prices. Taxes alter the price and quantity of goods sold compared to what they would be if the market were not distorted, and thus lead to some diminution in the value of trade between buyers and sellers that would otherwise be had.

3.5.1 Welfare payments

Welfare payments may be received by those with visual impairment and/or their carers, including the:

- Newstart Allowance which is an activity-tested income support payment for persons looking for work, aged 21 to 64;
- Disability Support Pension which provides income support for those with a physical or mental disability and is designed for those who are unable to work at least 15 hours per week, at or above the relevant minimum wage, independent of a program or support;
- Carer Payment which is an income support payment for people unable to support themselves through participation in the workforce, while caring for someone with a disability, severe medical condition or who is aged;
- Carer Allowance which is a supplementary payment for carers who provide daily care and attention at home for a person with a disability, severe medical condition, or who is aged. This may be paid in addition to income support payments; and
- Sickness Allowance is an income support payment for persons aged 21 to 64 who are employed and temporarily unavailable to work due to a medical condition.[74]

Data on the number of welfare payment recipients and the payments for the various welfare categories were obtained from the Department of Human Services 2018 annual report. The number of recipients receiving welfare due to visual impairment was retrieved from Access Economics (2009).[75] The prevalence of cataract-related visual impairment and blindness amongst all visual disorders was then applied to estimate the number of recipients and the total cost of cataract-related welfare payments.

Overall, it is estimated that nearly $48.7 million was paid out in welfare payments to persons with cataract and their carers in 2017-18 (see Table 3.4).

[74] People who have a short term condition typically receive the Sickness Allowance, so there are relatively few people with cataract who receive this payment type. As such, Sickness Allowance was not estimated in this report.
[75] Access Economics 2009, *Clear Focus - The economic impact of vision loss in Australia in 2009,* Report for Vision2020 Australia.

Table 3.6: Estimated cataract-related welfare payments in 2017-18

Payment type	Estimated recipients	Annual payment ($)	Total payments ($m)
Newstart Allowance	1,012	13,759	13.9
Disability Support Pension	213	21,718	4.6
Carer Payment	1,107	19,642	21.7
Carer Allowance	2,320	3,608	8.4
Total	**4,652**		**48.7**

Source: Department of Social Services (2018) and Deloitte Access Economics analysis.[76]

3.5.2 Taxation revenue

Reduced earnings from lower employment participation and lower output result in reduced taxation revenue collected by the Government. As well as forgone income taxation, there would also be a fall in indirect (consumption) taxes, as those with lower incomes spend less on the consumption of goods and services. Lost taxation revenue was estimated by applying an average personal income tax rate and average indirect taxation rate to lost earnings.

The average rates of taxation were derived by dividing net income tax and net indirect tax by the taxable income. This method was also used to derive the average company tax rate, which was then applied to lost company earnings (through reduced output). Again, net tax for companies was divided by the total taxable income for companies. The respective tax rates used in the calculation of DWL were:

- 23.4% average personal income tax rate, and 12.7% average indirect tax rate; and
- 22.9% average company tax rate.

Applying these tax rates to the total productivity impacts (including informal care costs), the total lost individual income was estimated to be $8.3 million (including lost carer taxes), while the total lost company revenue was estimated to be $0.6 million in Australia in 2017-18.

3.5.3 Deadweight losses of taxation payments and administration

To estimate the DWL due to lost taxation revenue (given an assumption of no change in spending), taxes were assumed to be maintained by taxing either individuals or companies more as necessary (to replace the lost tax from either stream). Each tax in the economy imposes various burden on the efficiency of society. Analysis by KPMG (2010) and Cao et al (2015) report the marginal burden of various government taxes (both State and Commonwealth).[77] Briefly:

- income tax has been estimated to impose a burden of $0.25 for every $1 raised;
- company tax has been estimated to impose a burden of $0.50 for every $1 raised;
- goods and services tax has been estimated to impose a burden of $0.19 for every $1 raised;

[76] Department of Social Services 2018, *Department of Social Services Annual Report 2017-2018*. Available from: https://www.dss.gov.au/about-the-department/publications-articles/corporate-publications/annual-reports. Accessed December 2018.

[77] Cao L, Hosking A, Kouparitsas M, Mullaly D, Rimmer X, Shi Q, Stark W, Wende S. 2015. *Understanding the economy-wide efficiency and incidence of major Australian taxes*, The Australian Government the Treasury, Canberra.

KPMG Econtech (2010). *CGE analysis of the current Australian tax system*. Report for the Australian Government the Treasury, March, Canberra.

State taxes were estimated to impose a burden of $0.45 for every $1 raised based on the respective shares of revenue raised through major state taxes including gambling, insurance, motor vehicle taxes, payroll tax and stamp duties (KPMG, 2010; ABS, 2016b).[78]

It is important to consider state and territory taxes because the states and territories pay for a proportion of health services. Based on the 2017-18 Federal Budget (Commonwealth of Australia, 2017), approximately 69% of state and territory health expenditure is paid for by state and territory taxes, while the remaining 31% is paid for by transfers from the Commonwealth.[79] Thus, the relevant burden imposed by taxation to pay for state and territory health expenditure is allocated to both income taxes, and the weighted state and territory taxes. Weighted by the revenue raised:

- reduced income for consumers and carers result in a 23.7% efficiency loss;
- reduced income for employers results in a 50.8% efficiency loss;
- welfare payments, health and other Commonwealth Government expenditure results in a 29.0% efficiency loss; and
- State and Territory Government health expenditure results in a 37.7% efficiency loss.

Table 3.5 shows the estimated reduced income and health expenditure payments, the applied efficiency loss of raising taxation, and the resulting DWL associated with cataract in 2017-18. All rates of efficiency loss include a 0.8% administrative loss which covers expenses of administering taxation (Australian Taxation Office, 2016). The total DWL due to cataract in Australia were an estimated $162.2 million in 2017-18.

Table 3.7: DWL due to cataract in Australia, 2017-18

Cost component	Total cost ($m)	Rate of efficiency loss (%)	Resulting DWL ($m)
Welfare payments	48.7	29.0	14.1
Commonwealth health expenditure	287.9	29.0	83.5
State health expenditure	142.0	37.7	53.5
Lost consumer taxes	30.6	23.7	7.3
Lost company taxes	5.7	50.8	2.9
Lost carer taxes	4.0	23.7	0.9
Total	**512.9**		**162.2**

Source: Deloitte Access Economics analysis.

3.6 Burden of disease

There are substantial wellbeing losses due to cataract. As one of the five most common eye diseases, cataract is responsible for 15% of vision loss and 12% of blindness in Australia.[80]

This section adopts the burden of disease methodology to quantify the impact of cataract on wellbeing. The approach is non-financial, where reduced quality of life and premature mortality are measured in terms of disability adjusted life years (DALYs).

[78] KPMG Econtech (2010). *CGE analysis of the current Australian tax system*. Report for the Australian Government the Treasury, March, Canberra.
Australian Bureau of Statistics (ABS). (2016b). Taxation Revenue, 2014-15, Cat. No. 5506DO001.
[79] Commonwealth of Australia (2017), *Budget 2017-18*, Federal Financial Relations, Budget Paper No. 3, May, Canberra.
[80] Access Economics 2009, *Clear Focus - The economic impact of vision loss in Australia in 2009,* Report for Vision2020 Australia.

3.6.1 Valuing life and health

The burden of disease methodology was developed by the World Health Organization and is a comprehensive measure of mortality and disability from conditions for populations around the world. The burden of disease methodology is a non-financial approach, where life and health can be measured in terms of DALYs. DALYs include both years of life lost due to premature death (YLLs) and years of healthy life lost due to disability (YLDs).

Disability weights are assigned to various health states, where zero represents a year of perfect health and one represents death. Other health states are given a weight between zero and one to reflect the loss of wellbeing due to a particular condition. For example, a disability weight of 0.2 is interpreted as a 20% loss in wellbeing relative to perfect health for the duration of the condition.

The burden of disease as measured in DALYs can be converted into a dollar figure using an estimate of the value of a statistical life (VSL). The VSL is an estimate of the value society places on an anonymous life. The Department of the Prime Minister and Cabinet (2014) provided an estimate of the 'net' value of a statistical life year (VSLY) – that is, subtracting financial costs borne by individuals.[81] This estimate was $182,000 in 2014 dollars, which inflates to around $194,202 in 2017-18 dollars for the VSLY using the Consumer Price Index.

3.6.2 Mortality

There is an increased risk of mortality from visual disorders that result in visual impairment, including cataract. Some studies indicate that cataract is symptomatic of a deterioration in health and therefore is unlikely to cause mortality.[82] However, other studies find a strong link between visual impairment and a higher risk of mortality, especially amongst older persons.[83] In particular, Karpa et al (2009) found visual impairment contributes to disability in walking, which significantly impacts on general health. As outlined in Appendix A, there were an estimated 222 cases of cataract-related mortality in 2017-18.

3.6.3 Wellbeing costs

The YLDs associated with cataract were estimated by applying a representative disability weight to the prevalence of cataract. To estimate the disability weight, data were collected from the Global Burden of Disease study; the disability weights from the Global Burden of Disease are also used by the AIHW in the Australian Burden of Disease study. The Global Burden of Disease provides disability weights for severity of cataract, and estimated severity distributions.

---

[81] Available at https://www.pmc.gov.au/sites/default/files/publications/Value_of_Statistical_Life_guidance_note.pdf.

[82] Knudsen, EB, Baggeson, K and Naeser, K 1999, 'Mortality and causes of mortality among cataract-extracted patients. A 10-year follow-up', *Acta Ophthalmalogica*, 77(1):99-102.
Song, E, Sun, H, Xu, Y, Ma, Y, Zhu, H and Pan, CW 2014, 'Age-Related Cataract, Cataract Surgery and Subsequent Mortality: A Systematic Review and Meta-Analysis', *PLOS One*, 9(11):1-10.

[83] Karpa, MJ, Mitchell, P, Beath, K, Rochtchina, E, Cumming, RG and Wang, JJ 2009, 'Direct and Indirect Effects of Visual Impairment on Mortality Risk in Older Persons', *JAMA Ophthalmology*, 127(10):1347-1353.
Fong, SC, Mitchell, P, Rochtchina, E, Teber, ET, Hong, T and Wang, JJ 2013, 'Correction of Visual Impairment by Cataract Surgery and Improved Survival in Older Persons', *American Academy of Ophthalmology*, 120(9):1720-1727.

Table 3.8: Cataract disability weights 2016

Disability	Description	Disability weights
Moderate visual impairment due to cataract	Vision problems that make it difficult to recognize faces or objects across a room.	0.031 (0.019-0.049)
Severe visual impairment due to cataract	Severe vision loss, which causes difficulty in daily activities, some emotional impact (for example worry), and some difficulty going outside the home without assistance.	0.184 (0.125-0.258)
Blindness due to cataract	Completely blind, which causes great difficulty in some daily activities, worry and anxiety, and great difficulty going outside the home without assistance.	0.187 (0.124-0.26)

Source: GBD collaborators (2016).[84]

The disability weight (0.045[85]) was multiplied by the prevalence of vision loss from cataract in Australia to estimate the YLDs associated with cataract.[86]

Included in wellbeing costs are those associated with falls and depression that occur as a direct result of cataract, which make a significant contribution to the total cost.

It was estimated that there were 385 hospital admissions resulting from falls caused by cataract in 2017-18. By applying the disability weight for hip fractures (0.81) to these admissions, with an assumed recovery period of four months[87], there were an estimated 104 YLDs as a result of falls due to cataract in 2017-18.

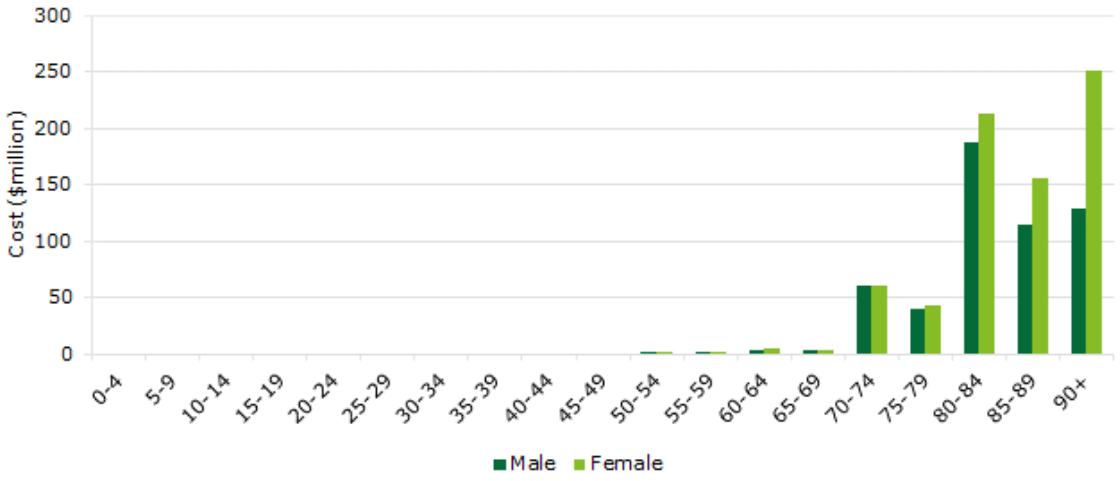
Similarly, it was estimated that there were 1,588 cataract-related cases of depression in 2017-18. By applying the disability weight for depression (0.22), there were an estimated 347 YLDs as a result of depression due to cataract in 2017-18.

Finally, there is also mortality as a result of cataract in Australia. As noted in section 3.7.2 and Appendix A, vision loss from cataract increases the risk of mortality, and caused an estimated 222 deaths in Australia in 2017-18. The YLLs are calculated by multiplying the average life expectancy at the age of death by the number of deaths due to the condition. In total, there were 1,247 YLLs due to vision loss from cataract in 2017-18.[88]

Overall, it was estimated that 6,748 DALYs were associated with cataract in Australia in 2017-18. Converting the DALYs to a dollar estimate using the VSLY, the total cost associated with the loss of wellbeing was estimated to be $1.28 billion in Australia in 2017-18. DALYs were estimated to be slightly higher in females than in men, largely reflecting the greater prevalence in older age groups (both in rate and number).

[84] GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017; 390: 1211–59.
[85] The disability weight represents the average of the disability weights for mild, moderate and severe vision loss from cataract, based on the Global Burden of Disease study (GBD collaborators, 2016).
[86] It is plausible that there may be some reduction in wellbeing for people who have cataract surgery, but are not classified as having vision loss from cataract. In the interests of conservatism, and because there is no disability weight for a health state that defines awaiting cataract surgery, we have not included such wellbeing losses in the report.
[87] The assumption of a four-month recovery period for a hip fracture is drawn from the research by Magaziner et al (2000). With the exception of lower extremity function, which is not expected to completely recover for over 11 months, other symptoms, such as depression, upper extremity function and cognition are expected to recover within a four month period. Furthermore, it is assumed that due to the distribution of cataract being greater amongst the elderly, that the four-month period is sufficient to allow a patient to return to a level of independent functionality.
[88] YLLs that occur in the future have been discounted by 3% per annum when converting YLLs to a monetary value.

Chart 3.1: Loss of wellbeing associated with cataract in Australia, 2017-18



Source: Deloitte Access Economics analysis.

3.7 Value of the Prostheses List

As outlined in section 1.3, the value of the PL can be informed through the costs incurred by the additional waiting time imposed on people waiting for ophthalmic surgeries – in particular, the longer waiting time for cataract surgery. Moreover, the value to different players in the ophthalmic sector can also be estimated – for example, the value to government of private sector surgeries can be estimated by comparing how much money government contributed to private sector surgeries, compared to in the public sector.

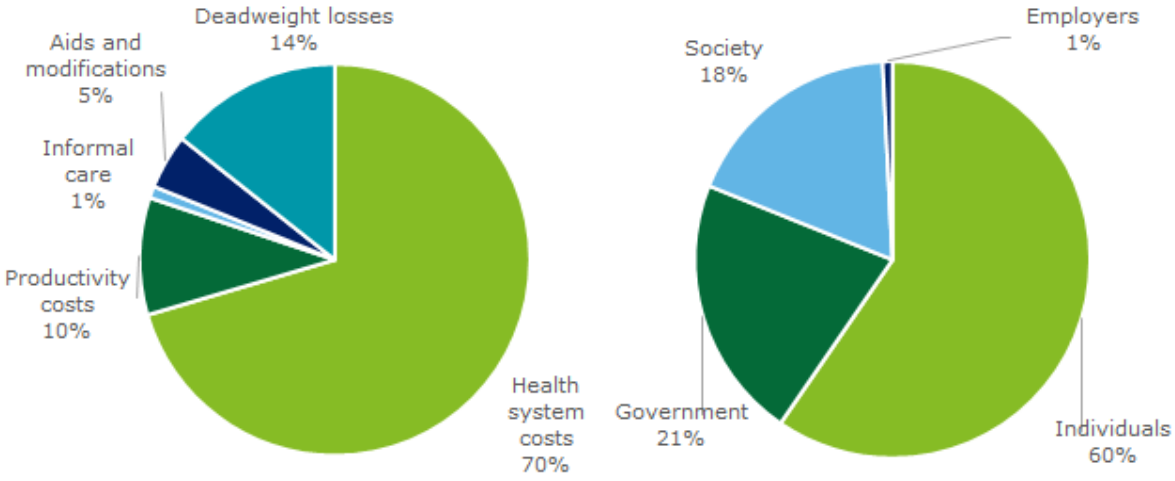
Briefly, the value is derived from the total costs of cataract in Australia each payer incurs on a daily basis (section 3.8.1), which was then combined with the difference in waiting times for public and private sector cataract surgeries to estimate the savings to society from private surgeries, as enabled by the PL (section 3.7.2). Section 3.7.2 also provides estimates of the savings to individuals, governments and other parts of society.

3.7.1 Summary of costs of cataract in Australia

This report found that 1.9 million Australians were living with cataract, though only 110,000 are visually impaired or blind due to cataract. Treating cataract costs the health system $795.4 million each year, or $3,121 per surgery.

Health systems costs make up the largest share of total financial costs (70.5%), while DWL and productivity costs (including informal care) comprise 14.4% and 10.7% of financial costs, respectively (Chart 3.2). Governments bore 45.9% of the total financial costs, followed by society and other payers (38.7%), and individuals (15.6%) (Chart 3.2).

Chart 3.2: Financial costs associated with cataract by component (LHS) and payer (RHS), 2017-18



Source: Deloitte Access Economics analysis.

Overall, the total financial costs associated with cataract were estimated to be $1.1 billion in 2017-18, or $4,430 per surgery. Including the loss of wellbeing, the total costs of cataract were an estimated $2.4 billion, or $9,465 per surgery.[89] The costs associated with cataract in Australia in 2017-18 are summarised by cost component in Table 3.9.

Table 3.9: Total costs associated with cataract in Australia by cost bearer, 2017-18

Cost component	Individuals/ Families ($m)	Governments ($m)	Other parts of society ($m)	Total ($m)	Cost per surgery ($)	Proportion of total (%)
Health system	90.5	429.9	275.1	795.4	3,121	33.0
Productivity costs	54.1	36.2	19.1	109.4	429	4.5
Informal care	7.1	4.0	-	11.0	43	0.5
Aids and modifications	51.0	-	-	51.0	200	2.1
DWL	-	-	162.2	162.2	636	6.7
Transfers	-48.7	48.7	-	-	-	0.0
Financial costs	**153.9**	**518.7**	**456.3**	**1,129.0**	**4,430**	**46.8**
Loss of wellbeing	**1,283.2**	**-**	**-**	**1,283.2**	**5,035**	**53.2**
Total	**1,437.2**	**518.7**	**456.3**	**2,412.2**	**9,465**	**100.0**

Source: Deloitte Access Economics analysis.

[89] Not all cataract surgery patients have visual impairment at the time of their surgery. The wellbeing impacts of visual impairment at the time of surgery were assumed to be the same as the wellbeing impacts due to prevalence of visual impairment due to cataract in Australia. Primarily, this assumption was made to ensure that the wellbeing impacts were not overstated, reflecting the progressive nature of cataract. Only about 5% of people with cataract have mild to moderate visual impairment, and 1% have severe visual impairment (blindness) (see Appendix A). Combined, about 110,000 people have visual impairment due to cataract. Given there are approximately 250,000 cataract surgeries each year, only about half are likely to involve visual impairment due to cataract, and most of that is likely to be mild visual impairment. More detail on the burden of disease methodology is provided in section 3.6.

3.7.2 Savings to society from private surgery

The value of the PL is more directly reflected by the additional value derived from technologies that are available on the PL, but not in the public sector. Unfortunately, data on the exact market share of each lens technology in the private and public sector are not available. Thus, it is not possible to estimate this direct value accurately. However, advice from suppliers indicated that all presbyopia-correcting devices are provided in the private sector (through the PL). For cataract, data from a survey of European ophthalmologists indicate that premium device technologies make up approximately 13% of the market, which is approximately 33,000 devices if the same proportion applies in Australia.[90]

Approximately 85% of patients who receive premium devices no longer require spectacles, compared to 10% of patients who receive monofocal devices (see Table 3.3). Thus, the value of the PL to patients who receive premium technologies is likely to be $2.7 million this year alone, although these lenses will last for a number of years.[91] On average, presbyopia-correcting lenses on the PL cost $861, and monofocal lenses cost approximately $300 (see section 2.2). Considering the savings from spectacles alone, the premium lenses will likely become cost saving within 3 years.[92]

Patients will also enjoy the greater wellbeing benefits offered by the premium technologies. For example, patients who receive a MIGS device will no longer need to use eye drops to reduce the intraocular pressure in the eye, which is used to prevent the progression of glaucoma.

Given that there are no direct data on the value of the PL, an alternate approach was explored in this report to quantify the value of the PL. Access to private ophthalmic treatment, enabled through access to the PL, provides value to patients and government in two other main ways:

- patients have a considerably reduced waiting time for private cataract surgeries, which reduces the burden of the condition on them and society more broadly; and
- government is able to shift the costs of treatment to patients and PHI, reducing the burden on taxpayers.

While the public system likely has comparable patient outcomes to the private system, there is a large difference in the waiting period for ophthalmic surgery between them; nationally, the average waiting time is 86 days for cataract surgery in the public sector[93], compared to an estimated 17 days for cataract surgery in the private sector (Table 3.11) – a difference of 69 days.

[90] European Society of Cataract & Refractive Surgeons. 2017. ESCRS Clinical Trends Survey: 2017 results. Available at: https://www.eurotimes.org/wp-content/uploads/2018/11/Clinical_Survey_Supplement-2017Results-12pp-final.pdf. Accessed February 2019.
[91] Assuming that each patient requires 2 devices, so premium lenses were provided to 16,500 patients in 2017-18, and an additional 12,375 patients no longer required spectacles. These patients no longer need to purchase spectacles or see an optometrist, which is a saving of $220 (section 3.1.2).
[92] Assuming that each patient will have required a new pair of spectacles each year (including a consultation with an optometrist).
[93] Australian Institute of Health and Welfare (AIHW) 2018, Elective surgery waiting times 2017–18: Australian hospital statistics. Cat. No. HSE 215.

Table 3.10: Estimated waiting times for private cataract surgery

	Days
Median days waited for patients admitted from public hospitals with PHI	30
Median days waited for patients admitted from public hospitals with other funding source (incl. Department of Veterans' Affairs, Workers compensation, etc.)	14
Average days waited in Western Australian private hospitals*	8
Average	**17**

Source: AIHW (2018), HBF (2018).[94] Note: there are no publically available data on the waiting times for private cataract surgery by state/territory (excl. WA). * The waiting time in the HBF report may be lower as it reflects the waiting period from the time the surgeon notifies the hospital of the surgery, which may not be on the same day as they notify the patient.

Evidence from the AIHW (2018) shows that the waiting time is the longest in New South Wales (223 days), Tasmania (146 days) and the Australian Capital Territory (134 days) (Table 3.11).[95] Intuitively, the value of the private sector is likely greatest in the states and territories with the longest public waiting times, as the difference between the public and private sector will be greater, although the value will also depend on the relative costs of treatment within each state and territory.[96]

Table 3.11: Waiting times for public cataract surgery, by state and territory, 2017-18

	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	Aus.
Waiting times, public (days)	223	40	87	62	97	146	134	71	86

Source: AIHW (2018).

The greater waiting time for public surgery means that for each additional public patient, a greater cost is incurred by patients, their carers/families, government, business and society. For example, a patient waiting for surgery is more likely to have a fall and to experience depression. Freeman et al (2009) has noted that the delayed treatment of ophthalmic conditions could increase the negative psychological effects of cataract.[97]

Similarly, they may also require the help of a carer to undertake daily activities including shopping, cleaning and other household tasks. Of the costs of cataract in this report, different payers incur additional costs from patients waiting for surgery, including:

- potential for greater utilisation of the health system, including treatment for falls, depression and aged care;
- potential reduction in workforce capacity, for the duration of the patient's vision loss from cataract;
- need for informal care to assist with daily tasks;
- need for visual aids and other assistive devices while waiting for treatment;

[94] Australian Institute of Health and Welfare (AIHW) 2018, Admitted patient care 2016–17: Australian hospital statistics. Cat. No. HSE 201.
HBF 2018, *A comparison of wait times for public and private hospitals*. Available from: https://www.hbf.com.au/-/media/files/reports/hbf-wait-times-report-2018.pdf?la=en&hash=0AE382008A66BC55E16BF5A4C9C3F0EF56F5C567. Accessed December 2018.
[95] Australian Institute of Health and Welfare (AIHW) 2018, Admitted patient care 2016–17: Australian hospital statistics. Cat. No. HSE 201.
[96] As there are no publically available data on the waiting time for private ophthalmic treatments, it is not possible to estimate the value in each jurisdiction.
[97] Freeman, EE, Gresset, J, Djafari, F, Aubin, MJ, Couture, S, Bruen, R, Lahorte, A and Boisjoly, H 2009, 'Cataract-related vision loss and depression in a cohort of patients awaiting cataract surgery', *Canadian Journal of Ophthalmology,* 44(2):171-176.

- DWL resulting from reduced taxation for both patients and their carers, and additional health services (falls, depression, aged care); and
- reduced quality of life, due to ophthalmic conditions, falls and depression.

As such, the PL provided value to each party by averting the costs associated with delayed treatment.[98] The value of reduced waiting times was quantified by first translating the cost of cataract to the average cost of cataract per surgery per day (approximately $26 per day[99]). Of the total costs, an estimated 65% could be averted through a change in waiting times, so it is expected that society could save $16.77 per surgery per day. The value of the PL was then quantified by multiplying the average daily cost by the difference in waiting period (69 days) between the private and public sector, and by the number of private surgeries (177,396) to estimate the costs averted through a reduced waiting period. The value of reduced waiting times was worth an estimated $205.3 million in total. The wellbeing components represent the largest gain ($168.9 million), which is a benefit for patients. Of the $36.4 million in financial savings, individuals save $16.3 million, government saves $10.2 million, and society saves $9.9 million (Table 3.12).

In addition to financial and wellbeing savings from reduced waiting times and a lower cost of cataract and its associated visual impairment, there are also financial savings from shifting patients from the public to the private sector. Largely, these savings occur as the cost of surgery is lower overall in the private sector - $2,460 compared to $2,815. In addition, raising taxes to pay for government services also causes inefficiency losses known as DWL (section 3.5.3), so reducing public expenditure saves society money. While society and government save money through this patient shifting, individuals and insurers pay more.

To estimate the value of the shift to different payers, it is necessary to determine what portion of private and public surgery costs each payer bears. When a patient chooses to be treated in the private rather than the public sector, the government pays indirectly through the premium rebates, and through Medicare rebates. As noted in section 3.1.7, data from the AIHW (2018) show that governments, individuals and other parties pay for 31%, 12%, and 58% of total private hospital costs, respectively.[100] Similarly, the same data show that governments, individuals and other parties pay for 92%, 3%, and 6% of total public hospital costs, respectively. The value of patient shifting to each payer is then estimated by combining these shares with the cost of a cataract surgery in the private ($2,460) and public ($2,815) hospitals, and the volume of surgeries in the private sector (177,396), on the assumption that other things are held constant, aside from the sector performing the surgery.

The government pays $1,827 less for a private surgery than a public surgery, while individuals pay $208 more (through premiums, and out-of-pocket), and insurers pay $1,263. There is also a DWL reduction of $580 per surgery, which is a benefit for society. In aggregate, individuals pay $36.9 million more, governments pay $324.1 million less, insurers pay $224.1 million more, and DWL are reduced by $103.0 million (Table 3.12).

Table 3.12 show the savings to society from private cataract surgeries in 2017-18. The savings to individuals and their families/carers was worth an estimated $148.3 million. Similarly, the savings to governments was worth an estimated $334.3 million, and society was better off by an estimated $371.4 million, although other parts of society pay an additional $111.2 million.

[98] The benefits associated with a difference in outcomes between public and private patients has not been discussed in this report – any such benefits (or costs) would be additional to the savings identified. The benefits represent the value of reduced waiting times.
[99] The average cost per day includes both financial and wellbeing costs, so it is calculated as $9,465 divided by 365.
[100] Australian Institute of Health and Welfare 2018, *Health expenditure Australia, 2016-17*. Available from: https://www.aihw.gov.au/getmedia/e8d37b7d-2b52-4662-a85f-01eb176f6844/aihw-hwe-74.pdf.aspx?inline=true. Accessed December 2018.

Table 3.12: Savings to society from private cataract surgeries, by payer, 2017-18

Savings component	Individuals / Families	Governments	Other parts of society	Total
Savings from reduced waiting times				
Falls, depression and aged care ($m)	1.6	4.9	0.3	6.8
Informal care ($m)	0.9	0.5	-	1.5
Reduced employment ($m)	7.1	4.8	2.5	14.4
Aids and modifications ($m)	6.7	-	-	6.7
DWL savings from reduced waiting times ($m)	-	-	7.1	7.1
Wellbeing savings (non-financial) ($m)	168.9	-	-	168.9
Subtotal ($m)	*185.2*	*10.2*	*9.9*	*205.3*
Savings from patient shifting				
Surgery ($m)	-36.9	324.1	-224.1	63.1
DWL savings from patient shifting ($m)	-	-	103.0	103.0
Subtotal ($m)	*-36.9*	*324.1*	*-121.1*	*166.1*
Total financial savings ($m)	**-20.6**	**334.3**	**-111.2**	**202.5**
Total savings (including wellbeing) ($m)	**148.3**	**334.3**	**-111.2**	**371.4**
Savings per surgery ($)	**836**	**1,885**	**-627**	**2,093**

Source: Deloitte Access Economics analysis.

There is some uncertainty surrounding the wait time for ophthalmic surgeries in the private system, although anecdotal evidence suggests that it is likely to be short. For example, the current median waiting time for patients admitted from public hospital elective surgery waiting lists with PHI for any surgery ranges from 10 days in the Australian Capital Territory to 25 days in the Northern Territory.[101]

Substituting the shortest waiting period (ACT – 10 days) and longest waiting period (NT – 25 days) for the current estimated wait time for private cataract surgery (17 days) has a small impact on the savings to society from private cataract surgeries; the savings range from $347.6 million to $392.2 million, compared to the current estimate of $371.4 million.

If more patients were to shift to the private sector, there would be additional savings for society, individuals and governments, although insurers would pay more. As shown in Table 3.12, for each additional surgery in the private sector, individuals save $836 (largely through improved wellbeing), governments save $1,885, insurers pay $1,263 more and society saves $636, so that "other parts of society", which includes insurers, employers, other parties and society, pay $627 more overall. Table 3.13 shows the additional savings that could occur if the private sector were to perform all current public cataract surgeries instead, which was calculated by applying the savings/costs per surgery to the estimated number of public surgeries (77,458). The additional value to individuals and their families/carers would be worth approximately $64.7 million, and the additional value to governments would be worth $146.0 million. However, other parts of society would pay an additional $48.6 million. Overall, Australia would be better off by $162.1 million.

[101] Australian Institute of Health and Welfare (AIHW) 2018, Admitted patient care 2016–17: Australian hospital statistics. Cat. No. HSE 201.

Table 3.13: Additional savings that could be realised if public cataract surgeries occurred in the private sector, by payer, 2017-18

Savings component	Individuals/ Families	Governments	Other parts of society	Total
Savings from reduced waiting times				
Falls, depression and aged care ($m)	0.7	2.2	0.1	3.0
Informal care ($m)	0.4	0.2	-	0.6
Reduced employment ($m)	3.1	2.1	1.1	6.3
Aids and modifications ($m)	2.9	-	-	2.9
DWL savings from reduced waiting times ($m)	-	-	3.1	3.1
Wellbeing savings (non-financial) ($m)	73.7	-	-	73.7
Subtotal ($m)	*80.9*	*4.5*	*4.3*	*89.6*
Savings from patient shifting				
Surgery ($m)	-16.1	141.5	-97.8	27.6
DWL savings from patient shifting ($m)	-	-	45.0	45.0
Subtotal ($m)	*-16.1*	*141.5*	*-52.9*	*72.5*
Financial savings ($m)	**-9.0**	**146.0**	**-48.6**	**88.4**
Total savings (including wellbeing) ($m)	**64.7**	**146.0**	**-48.6**	**162.1**
Savings per surgery ($)	**836**	**1,885**	**-627**	**2,093**

Source: Deloitte Access Economics analysis.

Importantly, the PL produces benefits not only for individuals (largely through an increase in wellbeing), but also for government, which was an estimated $1,885 per surgery. Largely, this benefit occurs as government moves health expenditure onto patients and PHI funds, placing less burden on public health expenditure, and reduced economic inefficiencies (DWL).

4 Discussion

This chapter discusses the findings from Chapter 3 within the context of broader benefits that the PL provides to patients, the patient experience that was captured through interviews with patients who had received ophthalmic surgery in the public and private sectors, and the potential implications of reforms to the PL.[102]

4.1 Information from patient interviews

The experience of patients was explored through eight patient interviews with public and private patients who had recently had cataract surgery, glaucoma surgery, or both. Of the eight patient interviews, six were with private patients and two were with public patients; six were with patients who had cataract surgery in both eyes (on separate occasions), and two were with patients who had both cataract and glaucoma surgery.[103]

Deloitte Access Economics conducted the interviews over the phone. The interviews were semi-structured and lasted for 30-45 minutes each. The patients were asked a number of questions relating to their personal experience with the health system for their surgery, including in regard to their choice and overall experience. Participants were also invited to share any additional commentary outside of the original list of questions (Appendix B).

Waiting times for treatment

Consistent with the modelling in Chapter 3, the delay for treatment was a key issue raised by patients during the interviews. As outlined in Chapter 3, a shorter waiting time for private treatment provides a benefit to patients of $486 per surgery, which includes an increase in quality of life, improved productivity for the patient and their carers, and a reduction in spending on items such as stronger glasses, magnifiers, and improved lighting. In addition, quicker treatment reduces the severity of the condition, which results in lower treatment costs.[104]

To supplement these quantitative findings, the qualitative information from the interviews confirmed patient perspectives regarding the wellbeing impacts of waiting for surgery, with patients commenting that:

'My eye sight had deteriorated so much … I couldn't wait [for surgery]' – Private cataract patient

'Being able to proceed immediately [by going through the private system] was a huge factor. I could go ahead right then and there.' – Private cataract patient

'I wouldn't go out at night. I wasn't confident' – Private cataract patient

'The sooner [I had surgery] the better' – Private cataract patient

In addition to these quantified benefits, there are likely other benefits the PL provides which were not explicitly included in the model. These include **patient choice**, **patient experience, improved clinical outcomes**, and **fewer restrictions on independence**.

[102] Please note that the quotes attributed to patients are not verbatim, but capture the underlying meaning and intent of verbatim quotes from the patients.
[103] Some patients were treated for other eye conditions, although they generally did not impact on the cataract or glaucoma surgery.
[104] Stenevi, U, Lundstrom, M and Thorburn, W 2000, 'The cost of cataract patients awaiting surgery', *Acta Ophthalmalogica,* 78(6):703-705.

Patient choice

For ophthalmic surgery, privately insured patients have choice with regard to the device they receive, and the surgeon who performs the treatment.[105] Participation by patients in personal medical decisions is associated with improved health outcomes and increased accountability for health systems.[106] Medical professionals are increasingly encouraged to involve patients in treatment decisions, recognising that patients may have unique knowledge and be capable of providing valuable insight into their own conditions.[107] Ewert (2013) notes that it is progressively best-practice for patients to be able to voice any concerns or preferences regarding their own medical treatment.[108] This can be especially true for ophthalmic surgery where there exists a range of different devices that can produce different patient outcomes.

The interviews with patients identified that that most had little knowledge of the different devices available, and therefore implicitly accepted their doctors' recommendations. However, for the patients with knowledge of and preference for certain devices or providers, they were able to exercise their choice. For example, a private patient commented that after conducting their own research, they had opted for monofocal IOLs in favour of multifocal:

'I had a bad experience with multifocal glasses about a decade ago, so I knew I didn't want them' – Private cataract patient

Similarly, another patient articulated their desire to receive multifocal IOLs in order to become spectacle independent:

'When I learned that [multifocal lenses] could let me stop using glasses, I knew I wanted them' – Private cataract patient

Alongside the choice of device that the PL offers, private ophthalmic patients are also afforded their choice of ophthalmologist and/or surgical location.[109] Interviews with private patients demonstrated that being able to conduct their own research, obtain recommendations, and choose their ophthalmologist improved the experience of the patients:

'I told my doctor which [device] I wanted, although he initially recommended another one, he was happy to go with what I chose.' – Private cataract patient

Furthermore, the choice of location was another important aspect for patients, especially those in more regional locations. One patient commented that going through the private system enabled them to attend a hospital proximal to their residence for surgery:

'If I went public, I would have had to drive [a long distance to the nearest public hospital] and stay [until I could drive again], or get someone to drive me up and back. It would have been very inconvenient.' – Private cataract patient

As many ophthalmic surgeries entail two separate surgeries – typically a procedure on each eye on separate days – receiving consistent care and having the same surgeon perform both operations was viewed as important to patients' overall experience:

'It was great having the same point of contact and doctor for both surgeries' – Private cataract patient

---

[105] While it is ultimately the surgeon/hospital who chooses the specific device that will be used, they are able to choose from a range of devices to meet the patients' desired outcomes.
[106] Greenfield, S, Kaplan, S and Ware, JE 1985, 'Expanding patient involvement in care. Effects on patient outcomes', *Annals of Internal Medicine,* 102(4):520-528.
[107] Say, RE and Thomson, R 2003, 'The importance of patient preferences in treatment decisions—challenges for doctors', *BMJ,* 327(7414):542-545.
[108] Ewert, B 2013, 'Patient Choice Has Become the Standard Practice in Healthcare Provision: It is Time to Extend its Meaning Comment on "Is Patient Choice the Future of Health Care Systems?"'. *International Journal of Health Policy Management,* 1(3):227-228.
[109] If a patient chooses a specific surgeon, choice of surgery location is limited to the facility/facilities at which the doctor practices at.

Conversely, one public cataract patient interviewed described feeling less comfortable that the consulting ophthalmologists and surgeons differed in each surgery:

'I had different doctors for each surgery, including the anaesthetist. And the consultations in the weeks following were with different doctors … I was confused' – Public cataract patient

Patient experience

Private patients were positive about their experiences with ophthalmic surgery. Most patients indicated that receiving a comprehensive service was a primary reason for their positive experiences, particularly in helping patients to prepare for the surgery.

'My doctor has about six people working for him in his practice. [They were] very knowledgeable about what they do, and they did their homework on me. It made me feel like I was in good hands.' – Private cataract patient

Several private patients reiterated this sentiment in various ways. This included the information offered by clinic staff to help patients understand what the surgery would entail.

'The staff were absolutely marvellous. It was lovely to feel like I knew exactly what they were going to do. It definitely felt like they went the extra mile to explain it.' – Private cataract patient

The experiences of private patients on the day of their surgeries were also noted to have contributed to their positive experiences:

'It was a very good informed consent process and information [on the morning of the surgery]. It was all managed in a way that was professional, assertive and clear. The clinical side was managed very well, same with the personal side.' – Private cataract patient

Conversely, the experience of public patients with ophthalmic surgery was mixed. One patient described receiving a misdiagnosis, which led to a significant delay in treatment:

'I saw one doctor who diagnosed me with glaucoma. After being treated for glaucoma for six months, I saw another doctor who told me that it was cataract, not glaucoma. He then said to me "it says [on your record] that you don't want cataract surgery" even though I never said that. It was only then that the doctor made an appointment for me to have my cataracts done.' – Public cataract patient

Equally, another public patient spoke of the lack of information provided to them about what the procedure would entail:

'No one told me what I should expect on the day of the surgery. I had a few pamphlets explaining the surgery but that's about it.' – Public cataract patient

Access to the PL provides private patients with certainty that they can receive multifocal IOLs should they desire them. In contrast, public patients may receive multifocal lenses, but only if public hospitals purchase newer technologies.[110]

Clinical outcomes

Through the PL, privately insured patients have access to a wider range of devices than if the treatment was provided through the public health system. However, for public patients seeking to have a surgical procedure for glaucoma, access to MIGS is restricted to patients who have both cataract and glaucoma. MIGS devices are a range of prostheses used in the treatment of mild-to-moderate open-angle glaucoma that aim to provide a safe and more effective alternative to the traditional incisional glaucoma surgery. The main advantage of MIGS is that they are

[110] Some states may provide access to different IOL technologies. For example, suppliers noted that toric IOLs are commonly used in public hospitals in Western Australia. However, due to the variability between states/territories, public patients are never guaranteed to receive innovative IOL technologies that may improve patient outcomes.

non-penetrating and/or bleb-independent procedures, thus avoiding the major complications of surgery related to blebs and hypotony.[111]

This restriction effects approximately 300 patients per year[112], and means that for these patients these devices are not able to be used – despite their demonstrated effectiveness in reducing intraocular pressure and ongoing reliance on medication, and improvements in patients' visual acuity.[113]

The benefits of a MIGS device are highlighted by one patient who described the improvement in their sight following the implantation of a stent:

'I was having trouble seeing in that eye… they put in a stent. I couldn't believe how much it improved.' – Private glaucoma patient

Alternatively, the patient may delay treatment until their eye condition has further deteriorated to the point where they are able to access these devices. A significant health risk to patients emerges as a consequence of a delay in the surgical treatment of glaucoma. In a retrospective study of 212 eyes with acute close-angle glaucoma, Hillman (1972) found that many patients who were delayed in having surgery to relieve intraocular pressure suffered from visual loss due to damage to the optic damage.[114] Furthermore, despite the availability of medications, such as eye drops, as a temporary treatment for glaucoma while waiting for surgery, studies indicate that some patients have difficulty taking such medications and/or are unable to adhere to a medication schedule.[115]

For example, one public glaucoma patient described how they were required to use eye drops while waiting for their surgery to prevent the condition from progressing more rapidly:

'I didn't like using the drops and it became arduous to ensure that I remembered to take them every day' – Public glaucoma patient

Following the implantation of the MIGS device, the patient no longer required the use of the eye drops in the weeks following surgery.

For cataract patients, public patients will typically receive monofocal IOLs, while privately-insured patients have greater access to multifocal and toric IOLs (see Section 2.2 for a discussion of the differences in these technologies). As the primary goal of cataract surgery – increased visual acuity – is treated by replacing the defective lens with a new lens, a recent systematic review by the Canadian Agency for Drugs and Technologies in Health (CADTH) did not find any evidence of improved visual acuity for monofocal compared to multifocal IOLs.[116] The review noted that across all the studies there were methodological limitations which limited the strength of their findings.[117]

---

[111] Brandao, LM and Griershaber, MC 2013, 'Update on Minimally Invasive Glaucoma Surgery (MIGS) and New Implants', *Journal of Ophthalmology*, 2013(8):705915.
[112] This calculated is based on the 9% of patients each year who require glaucoma surgery independent of cataract surgery (Hume, 2018), and the estimated number of public glaucoma surgical patients in 2017/18.
[113] Richter, GM and Coleman, AL 2016, 'Minimally invasive glaucoma surgery: current status and future prospects', *Clinical Ophthalmology,* 10:189-206.
[114] Hillman, JS 1972, 'Acute closed-angle glaucoma: an investigation into the effect of delay in treatment', *British Journal of Ophthalmology*; 63:817-821.
[115] Sleath, B, Robin, AL, Covert, D, Byrd, JE, Tudor, G and Svarstad, B 2006, 'Patient-Reported Behavior and Problems in Using Glaucoma Medications', *Ophthalmology,* 113(3):431-436.
[116] Canadian Agency for Drugs and Technologies in Health 2018, *Premium versus Standard Intraocular Lenses for Cataracts: A Review of Clinical Effectiveness and Cost-Effectiveness.* Available from: https://www.cadth.ca/premium-versus-standard-intraocular-lenses-cataracts-review-clinical-effectiveness-and-cost. Accessed December 2019.
[117] The review noted that the available evidence makes it difficult to draw conclusions regarding the cost-effectiveness of different types of devices. Some studies concluded that premium lenses were more cost effective in terms of patient satisfaction (Orme et al, 2002), reducing long-term health care cost through greater spectacle independence (Dolders et al, 2004; Lin and Yang, 2014) or had a greater overall net benefit for patients (Maxwell et al, 2008). However, other studies stated that premium IOLs were less or equally cost effective in addressing best-corrected visual acuity (Lin and Yang, 2014), contrast sensitivity (Lin and Yang, 2014) and general visual acuity (Lin and Yang, 2014; Leyland et al., 2002). See:

However, the type of lens does determine whether other benefits of treatments are likely to be realised. For example, some types of lenses reduce the need for spectacles following surgery, which was a key benefit highlighted by several patients in the interviews:

'Even with glasses, I couldn't see this well before surgery' – Private cataract patient

''[The surgery] just made life easier than having to take glasses everywhere. I don't have to use glasses to read use by dates.' – Private cataract patient

'When I take my glasses off, I still get quite amazed.' – Private cataract patient

'I only need glasses to read the newspaper. Otherwise, I don't need them anymore' – Private cataract patient

A number of studies have identified that multifocal IOLs are more effective in providing spectacle independence following surgery than monofocal IOLs. The CADTH review concluded that spectacle independence for near vision was better for multifocal IOLs compared to monofocal, while for distance vision toric IOLs delivered improved outcomes compared to non-toric IOLs. A sample of additional studies that have identified increased spectacle independence from multifocal and toric IOLs include the following:

- A Cochrane Collaboration review of multifocal versus monofocal IOLs indicated that the former are more effective at improving near vision relative to monofocal IOLs, and that motivation to achieve independence from spectacles is the primary factor in patients' choice of lenses.[118]
- A systematic review of distance and near vision spectacle independence, which compared multifocal and monofocal IOLs, found no difference in distance vision dependence changes between the devices; however, it reported a significant advantage of multifocal IOLs for general spectacle dependence and for near vision spectacle dependence.[119]

Recent analysis by Zvornicanin and Zvornicanin (2018) showed that 83% of people receiving multifocal lenses achieved spectacle independence following treatment, while only 12% of people receiving monofocal lenses achieved spectacle independence.[120] The economic analysis (see Section 3) included this cost saving to patients in the model. However, as highlighted in the interviews, patients value spectacle independence beyond simply the cost savings:

'Eyesight is precious … I didn't really care what it cost' – Private cataract patient

In addition to spectacle independence, toric IOLs deliver superior outcomes for the treatment of astigmatism[121]. A systematic review and meta-analysis of 13 randomised controlled trials in which 707 eyes received toric lenses and 706 received non-toric IOLs identified that spectacle independence and residual astigmatism was lower amongst the cohort who received the toric IOLs.[122]

Canadian Agency for Drugs and Technologies in Health 2018, *Premium versus Standard Intraocular Lenses for Cataracts: A Review of Clinical Effectiveness and Cost-Effectiveness.* Available from: https://www.cadth.ca/premium-versus-standard-intraocular-lenses-cataracts-review-clinical-effectiveness-and-cost. Accessed December 2019.

[118] Calladine, D, Evans, JR, Shah, S and Leyland M 2012, 'Multifocal versus monofocal intraocular lenses after cataract extraction', The *Cochrane Database of Systematic Reviews,* 12(9):CD003169.

[119] de Silva, SR, Evans, JR, Kirthi, V, Ziaei, M and Leyland, M 2016, 'Multifocal versus monofocal intraocular lenses after cataract extraction', *The Cochrane Database of Systematic Reviews*, 12:CD003169.

[120] Zvorničanin, J and Zvorničanin E 2018, 'Premium intraocular lenses: The past, present and future', *Journal of Current Ophthalmology,* 30(4):287-296.

[121] Astigmatism is a vision condition that causes blurred vision. It occurs when the cornea is irregularly shaped or there is a curvature of the lens inside the eye. An irregularly shaped cornea or lens prevents light from focusing properly on the retina, the light-sensitive surface at the back of the eye. As a result, vision becomes blurred at any distance.

[122] Kessel, L, Andresen, J, Tendal, B, Erngaard, D, Flesner, P and Hjortdal, J 2016, 'Toric Intraocular Lenses in the Correction of Astigmatism During Cataract Surgery: A Systematic Review and Meta-analysis', *Ophthalmology,* 123(2):275-286.

The CADTH review noted there was some evidence of improved visual acuity for toric lenses compared to non-toric lenses. For example, the systematic review by Kessell et al. (2016) also pooled the results of two studies which examined uncorrected distance visual acuity in toric and non-toric IOL patients. The results showed that a statistically significant improvement in uncorrected visual acuity occurred in the toric IOL group. Similarly, another review, which compared outcomes in patients with accommodative and monofocal IOLs by pooling the analysis of two randomised controlled trials, revealed significantly greater corrected distance visual acuity in the accommodative IOL cohort.[123]

In discussing the improved clinical outcomes from multifocal and toric IOLs, it is important to note that one component in which monofocal IOLs deliver superior clinical outcomes is in contrast sensitivity and dysphotopsias[124]. In a systematic review of 66 studies on the contrast sensitivity of premium versus monofocal IOLs, 52 studies showed monofocal IOLs to create fewer issues than premium IOLs, especially multifocal lenses.[125]

Fewer restrictions on independence

The shorter waiting times for ophthalmic surgery in the private system can lessen restrictions on independence more quickly. For example, an analysis of two cohort studies of patients over 50 years who were on the public hospital waiting lists for cataract extraction revealed that one-third did not meet the required visual acuity standard for driving, which likely inconveniences patients and impacts on activities of daily living.[126]

One patient described how their cataract-related visual impairment impeded their travel plans:

'I had to postpone a trip overseas because of eyesight. My husband's work involves a lot of travel and I usually accompany him, but this time I wasn't able to go' – Private cataract patient

In a study of 613 elderly patients with cataract, within a year of treatment, change in visual function was accompanied by significant changes, in the same direction, in quality of life functions: night time driving, daytime driving, community activities, home activities, mental health, and life satisfaction.[127] Furthermore, a study by Fraser et al (2013) showed that even after first eye cataract surgery (where the other eye also requires surgery), the reduction in patients' contrast sensitivity and stereopsis was sufficient to allow for improvement in quality of life, including participation in social activities.[128]

The benefits of cataract surgery on social participation were reflected by several patients:

'Before my cataract operation, I had a little difficulty seeing. I'm playing [bowls] more now' – Private cataract patient

'I didn't like going out very much at night. Now it doesn't worry me' – Private cataract patient

[123] Ong, HS, Evans, JR and Allan, BD 2014, 'Accommodative intraocular lens versus standard monofocal intraocular lens implantation in cataract surgery', *The Cochrane Database of Systematic Reviews,* 1(5):CD009667.
[124] Dysphotopsias is visual disturbance that can be exacerbated by ocular surgery. There are two types of the condition: positive dysphotopsias, which creates as halos, starbursts, flashes, or streaks of light; and negative dysphotopsias, which is perceived as a shadow in the visual periphery.
[125] Wang, SY, Stem, MS, Oren, G, Shtein, R, Lichter, PR 2017, 'Patient-centered and visual quality outcomes of premium cataract surgery: a systematic review', *European Journal of Ophthalmology, 27*(4):387-401.
[126] Keay, L, Palagyi, A, Do, V, White, A, Lamoureux, E, Ivers, RQ, Pesudovs, K, Stapleton, F, Boufous and S, McCluskey, P 2016, 'Vision and driving status of older Australians with cataract: an investigation of public hospital waiting lists', *Clinical and Experimental Optometry,* 99(5):449-455.
[127] Brenner, MH, Curbow, B, Javitt, JC, Legro, MW, Sommer A 1993, 'Vision Change and Quality of Life in the Elderly: Response to Cataract Surgery and Treatment of Other Chronic Ocular Conditions,' *Arch Ophthalmology*, 111(5):680–685.
[128] Fraser, ML, Meuleners, LB, Lee, AH, Ng, JQ and Morlett, N 2013, 'Vision, quality of life and depressive symptoms after first eyecataract surgery', *Psychogeriatrics,* 13(4):237-43.

Furthermore, a multinational clinical trial found that, without glasses, multifocal IOL patients reported less limitation in ability to perform social activities and activities overall than did the monofocal control patients.[129]

4.2 Potential impact of reforms to the Prostheses List

As outlined in Section 4.1, access to ophthalmic devices on the PL provides a broad array of likely benefits that were not explicitly captured in the economic modelling in Chapter 3.

Recent reforms to the PL (see Section 2.3) will reduce MBPs by between 1% and 10% for IOLs, viscoelastic tools and all other ophthalmic devices in each of the years from 2018 to 2020, in addition to 10% reductions in MBPs for IOLs in 2017. The intention of these reforms is to reduce PHI premiums for members, by reducing prostheses expenditure for PHI providers which will flow through to members as reduced premiums, and result in an increase in PHI coverage. However, it is important to note that there are many competing factors that determine premium levels, and that demand for PHI is relatively inelastic due to the incentives presented by the means-tested Medicare Levy Surcharge, insurance premium subsidies and other regulatory vehicles. As such, a reduction in MBPs may not result in increased PHI coverage.

At the time this report was prepared, no publicly available data were available that could show a change in PHI premiums following the reduction in MBPs, although PHI firms are required to make declarations to the Minister for Health that they have applied the PL MBP savings to the premiums for their members.[130] In the event that the savings are being passed on, it is important to note that the savings from lower MBPs for IOLs are unlikely to result in material changes to PHI premiums. PHI firms have noted that a $200 million reduction in PL MBPs will translate into PHI premiums reducing by approximately 1%.[131] On the basis that the reforms would reduce expenditure on IOLs by approximately $11.3 million[132] in the private sector each year, the reductions to MBPs for IOLs would be expected to reduce PHI premiums by 0.06%[133] per year. On mid-level cover, this represents a reduction of approximately $1.25 per policy per year. This is considered unlikely to result in a significant improvement to PHI coverage rates.[134]

This finding – that reductions to MBPs for IOLs will have a very small impact on the price of premiums – is consistent with evidence from the Senate Community Affairs Committee's report on the price regulation associated with the PL.[135] This report noted that while PHI premiums had increased by 40% in the past 7 seven, PL MBPs had not increased in real terms over that period. Greater utilisation of prostheses is driving the growth in spending on prostheses and thus increases in PHI premiums, rather than the unit prices for prostheses.

However, while these reductions for IOL MBPs are unlikely to result in any significant impact to PHI coverage, it would be expected that hospitals would seek to reduce their negotiated price with manufacturers by approximately 10% per year. Ongoing reductions of this magnitude may have

---

[129] Javitt, JC and Steinert, RF 2000, 'Cataract extraction with multifocal intraocular lens implantation: A multinational clinical trial evaluating clinical, functional, and quality-of-life outcomes', *Ophthalmology,* 107(11):2040-2048.

[130] The Senate Community Affairs Reference Committee. (2017). *Price regulation associated with the Prostheses List* Framework. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/ProsthesesListFramework/Report

[131] The Senate Community Affairs Reference Committee. (2017). *Value and affordability of private health insurance and out-of-pocket medical costs*. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/Privatehealthinsurance/Report

[132] Calculated as $113.4m * a 10% reduction in MBPs. $113.4m is the value of cataract prostheses for private patients in 2017-18 – see Section 3.1.1

[133] Calculated as ($11.3m/$200m)*1%.

[134] This is approximated using the high and low price of policies from Bupa and Medibank for a middle-aged person on a singles cover, with a mid-level government rebate applied.

[135] The Senate Community Affairs Reference Committee. (2017). *Price regulation associated with the Prostheses List* Framework. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/ProsthesesListFramework/Report

implications for commercial viability, particularly for small-medium enterprises in the sector and the employment that they support. For example, a group of small-medium manufacturers of hip and knee prostheses presented evidence to a Senate Committee in 2017 that the reductions to MBPs for their products had led to them halting a significant R&D project, and resulted in employee redundancies.[136]

While device manufacturers in Australia have other streams of revenue in addition to payments from hospitals for their IOLs, it is reasonable to expect that year-on-year decreases in the order of 10% per year will limit their ability to continue to deliver a range of services that are associated with the newer technologies available through the PL, such as research and development of new products, support for clinicians in developing their understanding of new technologies, and in-theatre support for some treatments.[137]

Further, reduced R&D and innovation on new products erodes the differentiation of PHI, as over the long term the supply of new and innovative products into the market may slow down. This will reduce the incentive for consumers to hold PHI, as over time the range of products available through the PL will be more closely aligned to the range available to public patients. This in turn could shift the funding burden back towards the public system, and ultimately result in increased government expenditure for ophthalmic treatments.

4.3 Conclusions

In writing this report, Deloitte Access Economics sought to identify the value of the PL to patients. This report found that patients achieve positive outcomes through greater choice, not only of the surgeon or hospital, but also of the type of ophthalmic device they received. Patients were often driven by the difference in waiting times, and often expressed a desire to have the surgery as soon as possible.

The value of the PL was estimated by quantifying two benefits – (1) that of reduced waiting times in the private sector compared to the public sector, and (2) changes in expenditure when patients shift from the public sector to the private sector – ophthalmic surgeries performed in the private sector can save society $2,093 per surgery. Governments (savings of $1,885) and individuals (savings of $836) receive these benefits, while insurers pay more ($627)[138].

The PL supports the value proposition of private health insurance in Australia. The PL helps deliver substantial benefits, not only to patients, but also to government and society as a whole. Partly, this occurs as more timely access to cost effective private ophthalmic surgeries reduces the economic burden of ophthalmic conditions, although the value proposition also includes the positive experience due to choice of ophthalmic device.

By reducing payments for ophthalmic devices on the PL, it is possible that some of these benefits may be eroded. For example, hospitals and clinicians (with the ability to do so) may treat a higher proportion of patients in public pathways if the incentive to treat them privately is reduced. The PL is a valuable asset to both patients and government, providing both health and economic benefits to Australia. Therefore, any changes that might negatively affect the PL should be carefully considered.

---

[136] The Senate Community Affairs Reference Committee. (2017). *Price regulation associated with the Prostheses List* Framework. Available from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/ProsthesesListFramework/Report

[137] The greater range of devices, and more advanced technologies, that are available in the private system require additional in-theatre support from manufacturers. For example, multifocal IOLs require more in-depth preoperative ocular and optical assessment than for monofocal IOLs, and there are additional intra-operative complexities when using multifocal IOLs.

[138] While insurers pay more, the costs are met through patient premiums.

Appendix A: Epidemiology of cataract

A.1. Prevalence of cataract in Australia

National Eye Health Survey 2016

The National Eye Health Survey is the first nationwide survey to determine the prevalence and major causes of visual impairment and blindness in Australia prepared by the Centre for Eye Research Australia and Vision 2020 Australia. In the 2016 survey, almost 5,000 Australians, across 30 testing sites, completed a simplified eye test and questionnaire. Among the eye conditions participants were tested for was cataract.

The National Eye Health Survey defines cataract as 'a cloudy area on the eye's lens, formed when protein in the lens is damaged and clumps together, limiting the amount and clarity of light passing through the lens to the retina, causing poor vision'.

Due to the absence of a standardised grading system, to test for the presence of cataract, the survey employed experienced graders to assess anterior and posterior segment photographs of patients' lens. Patients were then categorised into one of three groups: no cataract, probable cataract, or definite cataract. Where graders had differing assessments, an ophthalmologist would adjudicate. In the absence of patient photographs, a trained clinician would perform an anterior segment examination.

Table A.1: Prevalence of visual impairment and blindness from cataract, 2016

Severity of cataract	Indigenous (n=1738)		Non-Indigenous (n=3,098)		Weighted average[a]
	Caused by cataract	Proportion (%)	Caused by cataract	Proportion (%)	Proportion (%)
Prevalence	231	13.29	720	23.24	22.89
Visual impairment (<6/12 acuity)	37	2.13	28	0.9	0.93
Blind (<6/60 acuity)	2	0.12	0	0	0.004

Notes: Based on 2016 Census data which indicates that Aboriginal and Torres Strait Islander people comprise an estimated 3.3% of the total Australian population

Source: Foreman et al (2016).[139]

Melbourne Visual Impairment Project and Blue Mountains Eye Study

The Melbourne Visual Impairment Project was the first population-based assessment of visual impairment and eye disease in Australia. The Melbourne Visual Impairment Project examined 3,271 persons aged 40 years and older from nine urban areas across Melbourne (83% of the eligible residents) and 1,473 persons from four rural Victorian communities (92% of those eligible). In the study, photos of patients' lenses and their opacities were clinically graded both during and afterward using the Wilmer Cataract Photograph-Grading System.

[139] Foreman, J, Keel, S, Xie, J, van Wijngaarden P, Jonathan, C, Taylor, HR, Dirani, M 2016, *The National Eye Health Survey 2016*. Available from: http://www.vision2020australia.org.au/uploads/resource/250/National-Eye-Health-Survey_Full-Report_FINAL.pdf. Accessed December 2018.
de Silva, SR, Evans, JR, Kirthi, V, Ziaei, M and Leyland, M 2016, 'Multifocal versus monofocal intraocular lenses after cataract extraction', *The Cochrane Database of Systematic Reviews*, 12:CD003169.

The Blue Mountains Eye Study was another population-based assessment of visual impairment and eye disease that sampled a representative cohort of older Australians. Participants were selected from two postcodes in suburbs west of Sydney, New South Wales – the Blue Mountains region. From 1992-1994, 3,654 residents aged 49-97 years (82.4% of eligible residents) were examined for a range of eye diseases, including cataract. To determine the presence of cataract, photographs of participants' lenses were graded using the Wisconsin Cataract Grading System.

Rochtchina et al (2003) pooled the data from the two studies to provide a more comprehensive insight into the prevalence of cataract and cataract surgery in Australia.[140] The prevalence numbers from the National Eye Health Survey and Rochtchina et al (2003) were applied to the national population to generate an estimated prevalence of cataract in Australia.

Table A.2: Estimated prevalence of cataract in Australia by age and gender, '000s, 2017-18

Gender	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
Female	34.7	55.6	107.8	170.8	190.5	171.2	161.3	109.5	88.7	1,090.2
Male	31.4	54.0	83.6	128.5	143.5	149.9	118.1	69.4	40.3	818.8
Person	**66.1**	**109.6**	**191.5**	**299.4**	**334.1**	**321.1**	**279.4**	**178.9**	**129.1**	**1,909.1**

Source: Deloitte Access Economics calculations based on Foreman et al (2016) and Rochtchina et al (2003). Note: components may not sum to totals due to rounding.

It should be noted that not all of those who present with cataract are suitable candidates, or will require as the first line of treatment, surgical interventions, as only a small percentage of those with condition – at a given period of time – experience significant cataract-related visual impairment (see Table 2.3).

A.2. Severity of cataract

Although there is a significant prevalence of cataract in Australia, only a small percentage of those with cataract present with visual impairment or blindness at one point in time. This is primarily due to the slow progression of the disease and the speed at which its symptoms can reversed. Furthermore, as the condition is predominantly associated with ageing, the prevalence of cataract-related visual impairment in the Australian population below aged below 50 year is negligible. The estimated prevalence of cataract-related visual impairment is shown in Table 2.3.

[140] Rochtchina, E., Mukesh, B. N., Wang, J. J., McCarty, C. A., Taylor, H. R., & Mitchell, P. (2003). Projected prevalence of age-related cataract and cataract surgery in Australia for the years 2001 and 2021: pooled data from two population-based surveys. Clinical & experimental ophthalmology, 31(3), 233-236.

Table A.3: Estimated prevalence of cataract with visual impairment, 2017-18

Gender / severity	50-59	60-69	70-79	80-89	90+	Total
Female						
Vision loss	624	1,184	12,115	26,425	17,627	57,976
Blindness	-	-	442	3,370	1,949	5,761
All visual impairment	700	1,322	12,557	29,795	19,571	63,737
Male						
Vision loss	602	1,130	11,380	20,309	8,731	42,151
Blindness	-	-	415	2,590	965	3,971
All visual impairment	602	1,130	11,795	22,899	9,696	46,122
Person						
Vision loss	1,226	2,315	23,495	46,733	26,358	100,127
Blindness	-	-	857	5,961	2,914	9,732
All visual impairment	**1,226**	**2,315**	**24,353**	**52,694**	**29,271**	**109,859**

Source: Deloitte Access Economics calculations based on Foreman et al (2016), and Rochtchina et al (2003).

A.3. Mortality from cataract

Despite cataract not being a life-threatening disease, there is an increased risk of mortality associated with disease. In a systematic review and meta-analysis of several ten prominent, population-based eye studies from six countries, the presence of cataract was 'significantly associated' with an increased risk of mortality.[141] The review showed the hazard ratios of cortical, nuclear and posterior subscapular cataract ranged between 1.26 and 1.55.

Eye diseases, such as cataract, are symptomatic of health deterioration, indicating that a correlation, not a causation, may exist between their contraction and the risk of mortality.[142] However, Karpa et al (2009) have shown visual impairment to have both direct and indirect effects that contribute to an increased risk of mortality.[143] The indirect consequences of visual impairment include a reduction in physical activity, increased risk of depression, and an increased risk of falling. Furthermore, in a follow up study to the Blue Mountains Eye Study, Fong et al (2013) found a 40% reduction in mortality risk for those who had cataract surgically corrected compared with those who did not have surgery.[144]

Table A.4: Estimated mortality from cataract in Australia by age and gender, 2017-18

Gender	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
Female	-	-	-	-	1	1	20	28	74	125
Male	-	-	-	-	2	1	24	25	44	97
Person	**-**	**-**	**-**	**-**	**3**	**2**	**44**	**53**	**118**	**222**

Source: Deloitte Access Economics calculations based on Karpa et al (2009).

[141] Song, E, Sun, H, Xu, Y, Ma, Y, Zhu, H and Pan, CW 2014, 'Age-Related Cataract, Cataract Surgery and Subsequent Mortality: A Systematic Review and Meta-Analysis', *PLOS One*, 9(11):1-10.
[142] Knudsen, EB, Baggeson, K and Naeser, K 1999, 'Mortality and causes of mortality among cataract-extracted patients. A 10-year follow-up', *Acta Ophthalmalogica*, 77(1):99-102.
[143] Karpa, MJ, Mitchell, P, Beath, K, Rochtchina, E, Cumming, RG and Wang, JJ 2009, 'Direct and Indirect Effects of Visual Impairment on Mortality Risk in Older Persons', *JAMA Ophthalmology*, 127(10):1347-1353.
[144] Fong, SC, Mitchell, P, Rochtchina, E, Teber, ET, Hong, T and Wang, JJ 2013, 'Correction of Visual Impairment by Cataract Surgery and Improved Survival in Older Persons', *American Academy of Ophthalmology*, 120(9):1720-1727.

Appendix B: Interview questions

B.1. Interview questions

Background information

1. Could you tell us a bit about your experience with the health system so far? For example, we are interested in whether you are going to be/were treated in the public or private system, what type of procedure you will be having/had, what treatment options you were provided with, and how satisfied you are/were with what your interactions with your health care team and surgeon.
2. What influenced your decision to use the private/public health system?
3. To what extent does/did your condition interfere or impact on your daily routine or your wellbeing? What impact is/did your condition having/have on your routine while you are/were waiting for treatment?
4. And how have these impacts changed following your surgery?

Patient experience – choice

5. Could you describe how using the public/private system has impacted on your choice and control over your treatment?
6. How much choice were you afforded with the types of lens/implant available for your surgery? Were you presented with options, and if so, what were they?
7. How important was choice to you in your overall decision making? Choice of lens/implant? Choice of ophthalmologist to perform the surgery (as referred by the GP)?
8. Why was it important?
9. How satisfied are you with the lens/implant?
10. Was cost a consideration in any of the choices you made for your surgery? If so, could you describe how cost affected your decision and what decisions you would have made if cost was not a barrier to receiving your ideal care?

Patient experience – surgery

11. How would you describe your preoperative experience on the day of the surgery? We are interested in your experience with admission to hospital, treatment by staff, and whether you felt well informed about the process (including before admission).
12. And what about your postoperative experience on the day of the surgery?
13. Could you describe the outcomes following your surgery?
14. Could you describe your experience of the overall process, including any steps that the hospital/surgeon took to review the success of your surgery?
15. Earlier, you described your experience with choice during your treatment. How did this choice affect your overall experience with your treatment?
16. Could you describe the factors that contributed to you having a more positive experience with your treatment?
17. How do you think your treatment, experience and outcomes may have differed if you were treated in the private/public system?

Final questions

18. If you were to have cataract or glaucoma surgery again, what would influence your decision to use the private/public system?
19. Do you have any further reflections on your experience with the public/private system with regard to the treatment of your eye condition?

Limitation of our work

General use restriction

This report is prepared solely for the use of the Medical Technology Association of Australia. This report is not intended to and should not be used or relied upon by anyone else and we accept no duty of care to any other person or entity. The report has been prepared for the purpose of describing the value to patients and government of accessing ophthalmic devices through the Prostheses List. You should not refer to or use our name or the advice for any other purpose

Deloitte Access Economics
ACN: 149 633 116
8 Brindabella Circuit
Brindabella Business Park
Canberra Airport ACT 2609
Tel: +61 2 6263 7000
Fax: +61 2 6263 7004

Deloitte Access Economics is Australia's pre-eminent economics advisory practice and a member of Deloitte's global economics group. For more information, please visit our website

www.deloitte.com/au/deloitte-access-economics