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1 **Process redesign of a surgical pathway improves access to**
2 **cataract surgery for Aboriginal and Torres Strait Islander**
3 **people in South East Queensland**

4

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11 **The authors declare no conflicts of interest**

1 **ABSTRACT**

2 **The Institute for Urban Indigenous Health (IUIH) aimed to improve access to cataract surgery in**
3 **urban South East Queensland (SEQ) for Indigenous Australians, without compromising clinical**
4 **visual outcomes. The Penchansky and Levesque concept of access as the “fit” between the**
5 **patient’s needs and the ability of the system to meet those needs was used to inform the**
6 **redesign of the mainstream cataract surgical pathway. IUIH staff and community stakeholders**
7 **mapped the traditional external cataract surgical pathway and then innovatively redesigned it**
8 **to reduce the number of patients being removed by the system at key transition points. The**
9 **integration of eye health within the primary health care (PHC) clinic has improved the continuity**
10 **and coordination of care along the surgical pathway, and ensured the sustainability of**
11 **collaborative partnerships with key external organisations. Audit data demonstrated a**
12 **significant increase in utilisation of cataract surgical services after the process redesign. Previous**
13 **studies have found that PHC models involving integration, coordination, and continuity of care**
14 **enhance patient health outcomes, however the IUIH surgical model extends this to tertiary care.**
15 **There is scope to apply this model to other surgical pathways, and communities who experience**
16 **access inequity.**

1 INTRODUCTION

2 Aboriginal and Torres Strait Islander peoples (thereafter referred to as Indigenous Australians)
3 have a life expectancy around 10 years lower, and experience a burden of disease 2.3 times
4 higher, than non-Indigenous Australians (AIHW 2016) Vision loss represents 11% of the health gap,
5 with Indigenous Australians suffering a six times higher rate of blindness (Taylor HR 2011). Major
6 causes of visual impairment in Indigenous Australians are refractive error (a need for spectacles),
7 cataract, and diabetic retinopathy, all of which are preventable or treatable (Taylor HR 2011).
8 Cataract is a condition where the lens of the eye clouds over, reducing the light entering the eye,
9 and impairing vision. Although blinding cataract rates are 12 times higher in Indigenous
10 Australians, there is a stark inequity of access to cataract surgery, with surgical rates being 7 times
11 lower, with little variation between urban, rural and remote locations (Taylor HR 2011).

12 Access to health care is a complex concept that is central to the performance of the healthcare
13 system. Penchansky postulates access as the “fit” between the patient’s needs and the ability of
14 the system to meet those needs. He identified five dimensions of access that are influenced by
15 both healthcare suppliers and patients: accessibility, approachability, acceptability, availability and
16 accommodation, and affordability (Penchansky R 1981). In 2013, Lévesque added the dimension of
17 appropriateness. Accordingly, access can be defined as the opportunity to reach and obtain
18 appropriate health care services when there is the perceived need for care (Levesque J 2013). This
19 definition recognises crucial transition points where barriers to access can become apparent along
20 the entire pathway of utilisation, including delays in searching for care due to lack of trust in
21 health care systems or poor health literacy (Levesque J 2013).

22 In 2011, Taylor described the Australian eye health pathway as “a leaky pipe” (Taylor HR 2011),
23 however it is really the system itself that fails patients, resulting in them “falling through the gaps”
24 along the pathway at the transition points between different providers. This is consistent with
25 Boudville’s (2013) finding that once patients were referred outside of the PHC, poor coordination
26 and follow up often resulted in patients not completing the pathway to cataract surgery (Boudville
27 A 2013). Other barriers included long wait lists, costs of accessing (private) surgery, complexity of
28 the surgical pathway, limited availability of public ophthalmology, and that private ophthalmology
29 services were inappropriate due to cultural barriers. These barriers are particularly applicable to
30 urban Indigenous Australians, who have been described as “the forgotten Australians”; with the
31 stereotype that “real” Aboriginals live “out bush” and that urban Indigenous people are
32 “assimilated” (Scrimgeour M 2007).

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1 Primary Health Care (PHC) represents the first (primary) layer of services encountered in health
2 care, including general practitioners (GPs), nurses, dentists and allied health professionals
3 (Australian Department of Health 2013). The UIIH assists, unites, integrates and leads 5 separate
4 Aboriginal and Torres Strait Islander Community Controlled Health Services (ATSICCHS) in SEQ with
5 planning, development and delivery of comprehensive, multidisciplinary PHC services within 18
6 PHC clinics in the SEQ region (Institute for Urban Indigenous Health 2015). In 2013, UIIH along
7 with its 5 member ATSICCHS published its *Eye Health Service in South East Queensland Mapping*
8 *Report* (Institute for Urban Indigenous Health 2013). Findings were that existing eye health
9 services were fragmented and lacked integration with the PHC. Eye health infrastructure was not
10 available; clients were referred to external eye health providers but this was not translating into
11 eye examinations and surgery. The major reasons cited by patients were “*perceived costs, lack of*
12 *coordination and recall, transport, and the low priority of eye health*”. Where patients were
13 accessing external eye services, there was limited feedback to the clinics, impeding effective case
14 management and co-ordination of care. One of the key recommendations from *The Eye Health*
15 *Service in SEQ Mapping Report* (Institute for Urban Indigenous Health 2013) (see Box 1) was to
16 improve access to tertiary eye health services especially cataract surgery in SEQ.

17

18 **Box 1: *Eye Health Service in SEQ Mapping Report* Recommendations:**

19 Establish an UIIH Regional Eye Health Program - aiming to offer on-site in all SEQ Aboriginal and
20 Torres Strait Islander Community Controlled Health Services:

- 21 • Comprehensive Eye Examinations by Optometrists
- 22 • Specialist Ophthalmology services within “hub” locations
- 23 • Improved access to tertiary eye services especially cataract surgery
- 24 • Access to no-cost Qld Government supplied spectacles for eligible patients
- 25 • Improved coordination and follow-up for eye services
- 26 • Integration of eye health into multi-disciplinary clinical services / case management / health
27 promotion

28

29 The purposes of this paper are (i) to describe the redesign of the mainstream cataract surgical
30 pathway and (ii) assess the impact of the new pathway on access to, and visual outcomes of,
31 urban Indigenous Australians in South East Queensland (SEQ).

32

1 **METHOD**

2 **Study Design**

3 Quality improvement methods (The Australian Council on Healthcare Standards (ACHS) 2013)
4 were used to (i) redesign the mainstream public hospital cataract surgical pathway and (ii) audit
5 routinely collected data to assess the impact of the new pathway.

6 **Setting**

7 The Institute for Urban Indigenous Health, a regional organisation, was established in 2009. It
8 currently comprises 18 PHCs and serves an area of 20,000 square kms from Bribie Island in SEQ's
9 North, to the Lockyer Valley in the West, and South to the New South Wales border. (Institute for
10 Urban Indigenous Health 2015) . It has built a trusting relationship with the Indigenous community
11 by implementing a holistic model of care and cultural safety (Baba J 2014).

12 **Patients**

13 In June 2015, almost 50% of the total Indigenous population for SEQ (over 26,000 Indigenous
14 Australian patients) had visited a PHC within the IUIH clinic network at least 3 times during the
15 previous 24 months. Over 400 patients per month had accessed eye health services. The age
16 distribution of the IUIH patient base is similar to the national Indigenous population pyramid.
17 Overall, 6.5% of patients are diabetic, skewed towards the higher age groups, with 38.5% of the
18 60+ year group having diabetes (IUIH & The Fred Hollows Foundation 2015).

19 **Process mapping**

20 Through consultation with key stakeholders in SEQ, the traditional external referral cataract
21 surgical pathway was mapped, to show where patients were being removed from the system or
22 experiencing unnecessary delays.

23 **Process redesign**

24 Collaborative brainstorming discussions between the Ophthalmic Surgeon, Eye Health Manager,
25 IUIH Clinical Director, community members, and senior Healthscope Hospital staff resulted in the
26 redesign of the cataract surgical pathway to reduce the number of patient journeys by removing
27 unnecessary steps. The aim was to undertake as many steps as possible "under the one roof" in a
28 culturally appropriate setting; and improve coordination, especially at the interfaces between
29 primary, secondary and tertiary levels of care.

1 **Audit**

2 Routinely collected patient demographic, health status (including visual measures), and external
3 referral data was accessed from patient's electronic medical records, and examined
4 retrospectively. Cataract surgical lists and run sheets were accessed for data regarding use of
5 resources (e.g. transport) and accompanying carers. Patient categorisation and progress along the
6 cataract surgical pathway for all patients referred during the 7-month period (December 2014-
7 June 2015) prior to, and after the introduction of the revised pathway (November 2015- May
8 2016) were audited.

9

10

11 **RESULTS**

12 **Process mapping of the mainstream public hospital cataract surgical pathway**

13 As shown in Figure 1, the mainstream public cataract surgical pathway involved several external
14 health care providers, with little involvement from the PHC service after the initial referral. Lack
15 of transport, inadequate patient information and coordination, along with poor approachability of
16 the large urban public hospital building itself, were identified as barriers to urban Indigenous
17 patients accessing surgery.

18

19 **Process redesign of the IUIH Regional Cataract Surgery Program**

20 The IUIH Regional Cataract Surgery Program involved fewer healthcare providers and close
21 involvement from the PHC facility along the continuum of the pathway (see Figure 1). Major
22 changes included the following: (i) all pre and post- operative appointments were undertaken
23 within the PHC clinic, (ii) the management of the surgical waitlist was undertaken by IUIH eye
24 health, and (ii) the co-ordination of the entire patient journey was undertaken by IUIH staff.

25

26 **Figure 1**

27

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1 In addition to above, an audit of eye care testing equipment in the region was conducted. The
2 identified gaps were filled through PHC clinic purchases and by funding from the Commonwealth
3 Department of Health and Ageing auspiced by The Fred Hollows Foundation. This resulted in 17 of
4 the 18 PHC clinics being able to provide full scope optometry services and 2 of the 18 clinics being
5 able to provide ophthalmology consultations and procedures. The entire regional cataract surgical
6 pathway was integrated into the broader health service, and co-ordinated by a team of regional
7 cataract surgery co-ordinators, overseen by the Eye Health Manager, who provided patient
8 support and logistics, for preoperative, surgery, and postoperative clinics.

9

10 **Key Elements of the UIIH Regional Cataract Surgery Program**

11 **Integration of Services**

12 Eye health is integrated within the clinic model of care, as part of the chronic disease management
13 process, with a multidisciplinary team-based approach.

14 Rather than being a visiting specialty service, the eye health team are employed by UIIH. To our
15 knowledge, this is unique and facilitates collaboration and integration with other UIIH program
16 areas. The eye health program has also benefited from the strong relationship between the local
17 Indigenous community and the holistic model of care used by UIIH (Baba J 2014). The centrally
18 organised UIIH regional transport was utilised by over 90% of the patients to attend surgical
19 appointments [Table 2].

20 Pivotal to care integration is the nationally available Care Coordination and Supplementary
21 Services Program., which targets Indigenous Australians diagnosed with a chronic disease to
22 ensure that patients are accessing services and managing their complex care needs consistent with
23 their GP Management Plan. Indeed, 81% of the cataract patients accessed this program.

24 Furthermore, the supplementary services part of the program, aims to expedite patients' access to
25 essential allied health or specialist services (surgical eye scans), including transport to the
26 service, where such services are not available publicly (Australian Department of Health 2016). The
27 care coordinators are critical to ensuring the seamless integration of services including organising
28 transport and accommodation for cataract patients, and more importantly providing systematised
29 care continuity.

30 The integration of many program areas within the UIIH model of care was integral to the success
31 of the regional cataract surgical program in addition to Care Co-ordination and Supplementary

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1 Services, and regional transport. UIIH Community Liaison Officers engaged and supported the
2 local Indigenous Community and were able to fulfil the role of a support person for the 33% of
3 clients with no accompanying carer, In addition, the UIIH regional pharmacist was onsite to
4 educate patients on administering post-surgery eye drops. The UIIH Telehealth program was
5 utilised for more than 50% of post-operative ophthalmologist consultations, Finally, the UIIH
6 Home Support team and mobile van provided onsite BBQ dinners as well as a social outing for
7 patients and carers.

8 **Collaborative Partnerships with external stakeholders**

9 Service providers involved in the coordination and delivery of the surgical services included both
10 private and non-government health organisations: (i) Check-up Queensland, as the Eye and Ear
11 Surgical Scheme (EESS) fund holder for SEQ, provided access to funding for unfunded services; and
12 (ii) Healthscope and Peninsula Private Hospital partnered with UIIH to provide access to surgical
13 facilities. The staff at the hospital was invaluable in welcoming clients; the pre and post-operative
14 assessments were done at an UIIH clinic, with staff assisting and supporting patients; Zeiss
15 Instruments made available the use of an Intraocular Lens Master machine, for essential pre-
16 surgical measurements; The Fred Hollows Foundation funded the intraocular lenses for surgery,
17 and Redcliffe Motor Inn provided accommodation.

18 **Audit of access before and after the process redesign**

19 After receipt of a referral, the public hospitals categorise patients for both initial assessment and
20 subsequently for surgical urgency as 1 (urgent- schedule within 30 days), 2 (semi-urgent- schedule
21 within 90 days) or 3 (non-urgent- schedule within 365 days). In a 7 month period before the
22 pathway redesign, only 1 (1.8%) of the 55 referred patients completed cataract surgery at the
23 public hospital while another 8 (14.5%) completed cataract surgery in the private system via
24 temporary funding. Of the 55 referred patients, 74.5% were either on the waitlist, had not been
25 assessed for urgency yet, or had been removed from the waitlist (after repeated non-attendances;
26 Table 1).

27

28 **Table 1**

29

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1 In the 7 month period after the pathway redesign, 46(45%) of the 103 referred patients completed
2 cataract surgery. Over two-thirds of these patients were diabetic, and almost 90% suffered from 2
3 or more chronic diseases. Four week post-operative check attendance rates were high (96%) and
4 visual clinical outcomes data showed that 93% of eyes achieved 6/7.5 visual acuity at this visit [See
5 Table 2].

6

7 **Table 2**

8

9 **Discussion**

10 This study compared a new integrated surgical pathway, with an existing external surgical
11 pathway. Integrating the cataract surgical pathway within the PHC service and collaborating with
12 external organisations improved coordination and increased the cataract surgery completion rate
13 for Indigenous Australians in SEQ, with high quality visual outcomes. Whilst evidence and data
14 regarding Australia's urban Indigenous population is sparse, several authors have identified
15 characteristics of successful health care systems for communities who experience access inequity
16 internationally including; multidisciplinary teams, community engagement, continuity of care, and
17 integrated co-ordinated health care (Miller A 2013) (Kaufman S 2014) (Gottlieb 2013) (Joshi C
18 2013) (Few R 2003). Our findings concur with the previous research while also presenting a novel
19 model of care to address the barriers to access. Improving access for urban Indigenous patients to
20 cataract surgery required a multifaceted innovative model of care across the entire pathway.

21 We found that acceptability and appropriateness of health care systems are key factors in
22 designing a new surgical pathway; however the facet of availability, particularly transport, is
23 equally important, even in an urban setting. These findings also align with Scrimgeour &
24 Scrimgeour who argue that of the 5A Perchansky "barriers to access", acceptability and
25 appropriateness was particularly important for urban Indigenous people, above availability and
26 affordability. Acceptability barriers included poor linkage and co-ordination across the health care
27 system, and cultural issues resulting in poor communication, system mistrust, and institutionalised
28 racism (Scrimgeour M 2007). The IUIH model of care, which is based on the Indigenous holistic
29 definition of health (Baba J 2014), has been integral to the acceptability of the cataract surgical
30 program because it ensured a high level of trust from Indigenous community members.

1 Coordinated care was essential, across primary, secondary and tertiary levels, not just PHC.
2 Coordination, which is often seen as a costly, even “fluffy” aspect of health care, requiring
3 extensive person power resources (Rich E 2012), is not simple, and can be difficult to accurately
4 define; however, it can achieve significant gains in efficiencies, including reduced service
5 duplication, and intangibles such as patient engagement and health literacy. A dedicated program
6 co-ordinator, with appropriate skills and knowledge of the referral pathways involved, was critical
7 to the success of the UIH regional cataract program.

8
9 In this cataract surgery project, philanthropic funds and “in kind” donations were utilised.

10 These donations, while not essential to establishing a cataract surgery program, were used in this
11 case to reduce the cost outlays for UIH, allowing more cataract surgeries to be completed within
12 the given budget.

13 There is a high risk of urban Indigenous patients being removed by the system if the surgical
14 pathway does not have seamless interfaces between levels of care. Access at the interfaces is
15 crucial, and this may be achieved through integrations, innovative collaborations, and partnerships
16 with external organisations. Our study demonstrated that with a coordinated patient journey,
17 with as many processes as possible undertaken “under the one roof”, improved access to cataract
18 surgery.

19

20 **Conclusion**

21 The key elements of the redesigned pathway, which included integration of services, and
22 collaboration with external organisations, may be applicable to other tertiary surgical pathways
23 besides cataract surgery. The access dimensions addressed through the revised pathway are
24 common to health care services throughout the whole system. The principle of wraparound care,
25 and bringing health services “under the one roof” as much as possible within the local, culturally
26 appropriate PHC clinic could be applied for other health services, primary, secondary and tertiary,
27 to improve health service access for urban Indigenous Australians. Further research into the
28 potential cost benefits of the UIH cataract surgical program for SEQ’s urban Indigenous people is
29 recommended, along with investigating the potential to incorporate key elements of the regional
30 cataract surgery program in a redesign of the external public hospital cataract surgical pathway.

1

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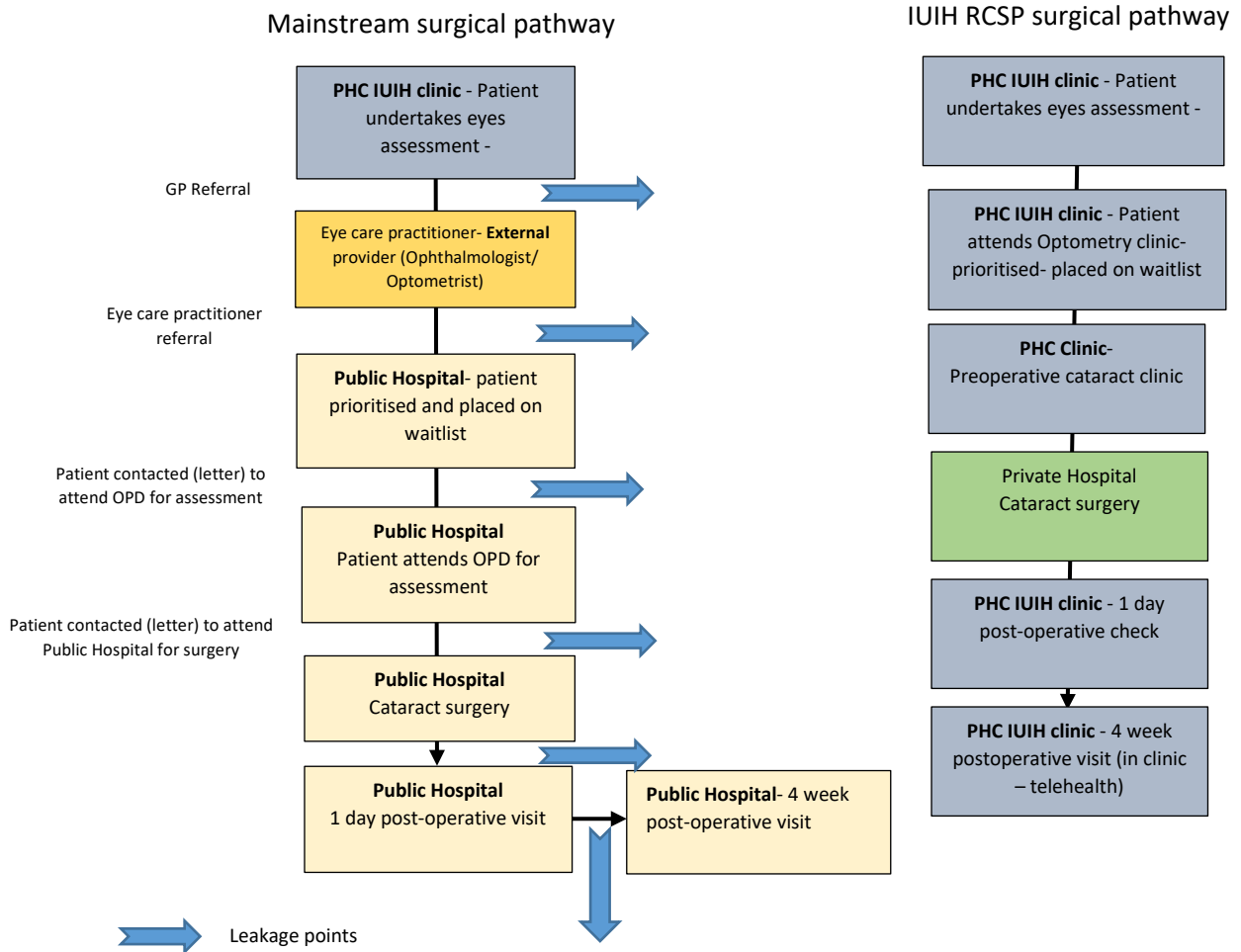
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- 9
- 10
- 11

1 **Figure 1: Cataract Surgical Pathways - Mainstream compared with IUIH RCSP**

2



3

4 **Legend**

- 5 Aboriginal and Torres Strait Islander Community Controlled Health Service
- 6 External Eye Care Practitioner
- 7 Public Hospital
- 8 Private Hospital

9

10

11

12

13

14

1 **Table 1- Cataract surgical completion rates before (December 2014- June 2015) and after (November**
 2 **2015- May 2016) the SEQ regional cataract surgery program process redesign**

Variable	Number (%) Dec 2014-June 2015: prior to process redesign	Number (%) Nov 2015–May 2016; after process redesign**	3 4 5 6
<i>Total number referred for cataract surgery</i>	55(100)	103 (100)	7
<i>Operations completed (at public hospital prior to process redesign, or private hospital after process redesign)</i>	1(2)	46(45)	8 9 10
<i>Operation completed through outsourcing*</i>	8(14)	n/a	11 12
<i>Total completed through public hospital or outsourcing prior to process redesign, or completed at private hospital after process redesign</i>	9(16)	46(45)	13 14 15
<i>Surgery scheduled but not complete</i>	5(9)	n/a	16
<i>On wait list</i>	26(47)	57(55)	17
<i>Removed from wait list</i>	3(6)	0(0)	18
<i>Urgency not assessed</i>	12(22)	0(0)	18 *
<i>Assessed as category 1</i>	1(2)	n/a	19
<i>Assessed as category 2</i>	12(22)	n/a	20
<i>Assessed as category 3</i>	27(49)	n/a	20
<i>Uncategorised or removed from list</i>	15(27)	n/a	21

22

23 *Outsourced to private suppliers through temporary surgery connect funding (Qld Govt)

24 ** Data source- IUIH Regional Eye Health Project 2016

1 **Table 2. Summary Profile Data – first 46 IUIH Regional Cataract Surgery Program cataracts**

	Male	Female	Total
	15 (33)	31 (67)	46
Demographics	<i>Males</i>	<i>Females</i>	<i>Total number</i>
	<i>number (%)</i>	<i>number (%)</i>	<i>(%)</i>
Age	59yrs 5months	67yrs 6 months	64yrs 10 months
Region – south side	8 (53)	19(61)	27(59)
Region – north side	7 (47)	12(39)	19(41)
Risk factors			
Smoking	14(93)	24(77)	38(83)
Diabetes	10(67)	21(68)	31(67)
>2 Chronic diseases	14(93)	27(87)	41(89)
Support services			
Carer accompanied patient	6(40)	25(81)	31(67)
Regional transport – pre-operative clinic	14(93)	28(90)	42(91)
Regional transport – surgery day	15(100)	28(90)	43(93)
Visual status*			
VA was measurable**	14(93)	30(97)	44(96)
Eyes preop VA- LP***	4(29)	2(7)	6(14)
Eyes preop VA ≤ 6/24	7(50)	9(30)	16(36)
Eyes preop VA≤ 6/12	10(71)	18(60)	28(64)
Eyes preop VA≤6/9	12(86)	27(90)	39(89)
Eyes post op VA≥6/7.5****	13(93)	28(93)	41(93)
Post operation support services			
Pharmacist’s contact	15(100)	31(100)	46 (100)
Clinical follow-up 1 day post op attendance	15(100)	31(100)	46(100)
Clinical follow-up 4 week attendance	14(93)	30(97)	44(96)
Diabetics 8 week follow-up attendance	9(90)	20(95)	29(93)
Telehealth follow-up consultations (% of total follow-up consultations)	12(50)	30(60)	42(57)
<i>Data source: IUIH Regional Eye Health Project 2016</i>			
*All eyes operated (preop) with VA > 6/9 were “second eyes” of diabetic patients			
** 2 due to dementia- VA not measurable and excluded from VA data			
*** Light Perception			
**** VA measured at the 4 week follow-up visit			

2