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Original Article

Funding models for outreach ophthalmology services

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Abstract

Background: This paper aims to describe funding models used and compare the effects of funding models for remuneration on clinical activity and cost-effectiveness in outreach eye services in Australia.

Design: Cross-sectional case study based in remote outreach ophthalmology services in Australia.

Participants: Key stake-holders from eye services in nine outreach regions participated in the study.

Methods: Semistructured interviews were conducted to perform a qualitative assessment of outreach eye services' funding mechanisms. Records of clinical activity were used to statistically compare funding models.

Main Outcome Measures: Workforce availability (supply of ophthalmologists), costs of services, clinical activity (surgery and clinic consultation rates) and waiting times.

Results: The supply of ophthalmologists (full-time equivalence) to all remote regions was below the national average (up to 19 times lower). Cataract surgery rates were also below national averages (up to 10 times lower). Fee-for-service funding significantly increased clinical activity. There were also trends to shorter waiting times and lower costs per attendance.

Conclusions: For outreach ophthalmology services, the funding model used for clinician reimbursement may influence the efficiency and costs of the services. Fee-for-service funding models, safety-net funding options or differential funding/incentives need further exploration to ensure isolated disadvantaged areas prone to poor patient attendance are not neglected. In order for outreach eye health services to be sustainable, remuneration rates need to be comparable to those for urban practice.

Key words: eye, research, survey.

Introduction

Outreach services for eye health care exist in most states and territories in Australia. From the available evidence, specialist outreach is generally accepted as an equitable and effective method to deliver secondary health services.[1,2] Given the geographic and population diversity across Australia's remote areas, it is not surprising that there is considerable variation in the way in which services operate across the country.[3,4] This is accentuated by the fact that most health-care planning is performed by State departments whereas Indigenous health care has often been planned and coordinated by Commonwealth departments through community-controlled health clinics. In addition, non-government organizations have advocated for disadvantaged remote communities and therefore private, corporate and charitable funds also have contributed. Some private practitioners have also developed individual arrangements with health services.

Two key funding models currently exist in Australia. Fee-for-service (FFS) remunerates a

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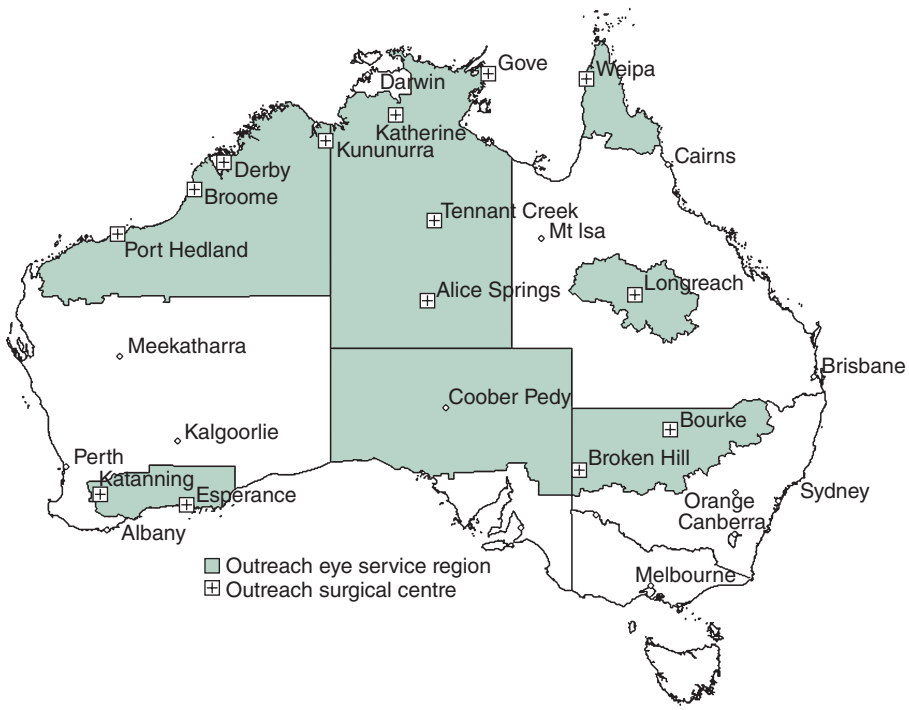


Figure 1. Map of outreach ophthalmology services included in survey.

health-care provider per patient attendance or procedure performed. Salary or sessional rates are independent of patient numbers and have capped daily allowances.

The aim of this study was to determine the effect that funding models have on clinical throughput and cost-effectiveness of outreach ophthalmology services.

Methods

Between January and April 2009, nine selected outreach ophthalmology services were visited. The selection of regions was partly opportunistic being related to timing of visiting ophthalmologists and partly designed to reflect services in diverse settings, for example different states, territories, coastal, inland, rural, remote, very remote, mainly Indigenous population or mainly non-Indigenous and with different funding models (Fig. 1).

Key stake-holders from differing backgrounds identified as information rich sources were selected to identify the nature of funding structures in place. Included interviewees were nurses, clinic clerical staff, Aboriginal health workers, hospital administrators, optometrists, ophthalmologists and eye service managers. Information relating to the nature of the service including funding models and sources for each site was tabulated for analysis and comparison. The annual total number of weeks that ophthalmology services were available in each region was determined, and a full-time equivalent was calculated based on a 48-week working year. A training registrar's time was estimated to be equivalent to half of a consultant's time based on audit data from Alice Springs hospital (Henderson T, 2009, unpublished audit data). The total clinic outpatients per year and cataract operations performed per year were divided by the number of ophthalmology weeks to determine the weekly throughput. The waiting times for surgery and clinic showed similar ranges and ranking between regions (Fig. 2), so the means were calculated and used for analysis. Total costs relating to the service from State, Commonwealth and other sources were collected for regions and divided by the number of clinic outpatients and cataract operations to determine a cost per attendance.

Clinical activity, waiting times and cost were compared with binary data relating to funding models for clinic, and surgery STATA version 10.2 (Stata Corporation, College Station, TX, USA) was used to perform Student's *t*-tests.

Results

Supply of ophthalmologists and optometrists

The population served by a single full-time equivalent ophthalmologist ranged from 21 600 to 530 000. All regions except the NT Top End outreach were above the national average of 28 000 people per ophthalmologist. The populations per optometrist in surveyed regions ranged from 12 500 to 43 500 per optometrist, which were all above the national average of 5432 people per optometrist (Fig. 3).

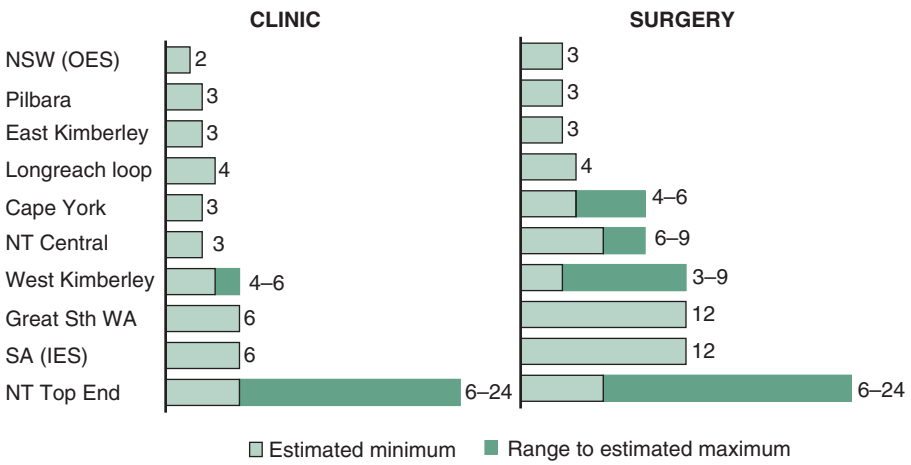


Figure 2. Waiting times.

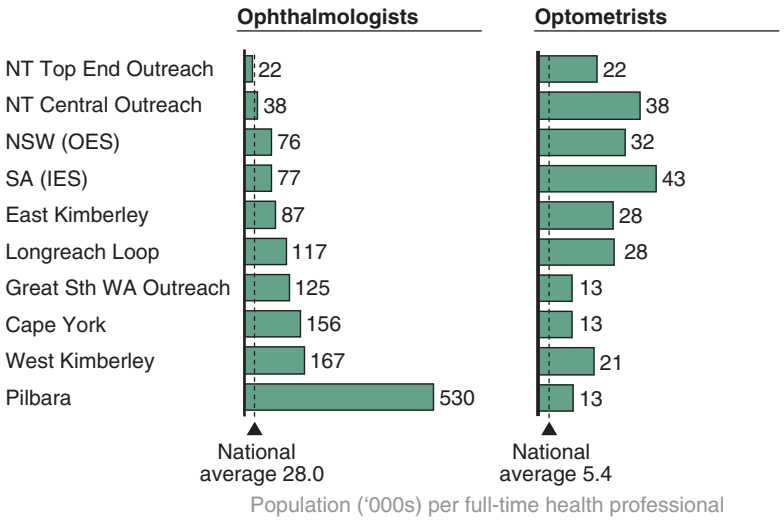


Figure 3. Population per eye care practitioner.

Optometry and ophthalmology availability data were combined to calculate the number of people per full-time equivalent eye care provider (Fig. 4). This demonstrated less variability between the regions than data for the separate professions.

Cataract surgery rate

The cataract surgery rates (CSR), the number of cataract operations per million people per year, were lower than the national average in all regions – with some up to 10-fold lower (Fig. 5). The Central Australia outreach figures are a result of recent intensive surgery ('blitz') weeks to address the excessive cataract surgery waiting times. When the number of Indigenous patients having cataract surgery is calculated for the Indigenous population in the region, the CSR change, although they still remain below the national average (Table 1).

Figure 6 shows threshold CSRs with respect to the surgical efficiency (weekly throughput/ ophthalmology week) and the supply of ophthalmologists. This graph demonstrates that in order to improve the CSR, a region such as the NT Top End Outreach needs to address health service or system issues to increase surgical efficiency whereas a service such as in the Pilbara operates very efficiently but requires an increase in the supply of ophthalmologists to improve the CSR.

Clinical activity

There is wide variation in the number of cataract operations performed per ophthalmology week across the regions with a 22-fold difference between the most and least efficient regions. Similarly, there was an 11-fold variation in weekly clinic throughput across the regions (Table 1). The South Australian

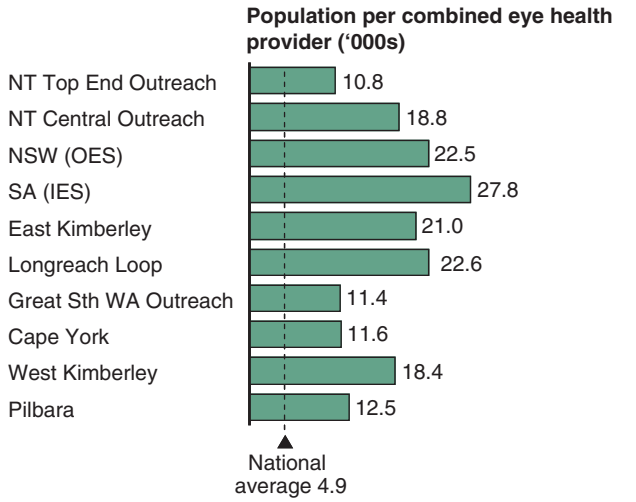


Figure 4. Number of people ('000 s) per combined eye health provider.

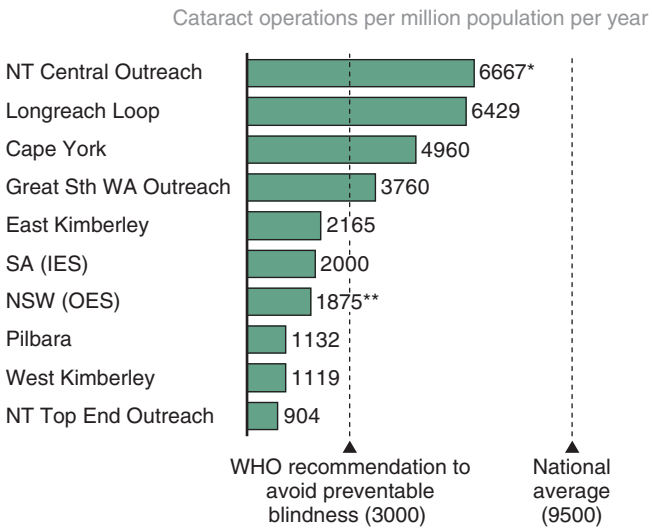


Figure 5. Cataract surgery rates. *Includes operations conducted during a 2008/2009 'blitz'. Figures in prior years ~40–50% lower. **Each ophthalmologist is capped to 60 cataract operations annually.

Indigenous eye service does not provide surgery at outreach locations. The NSW Outback Eye Service is the only region to have a cap or limit on number of operations they were allowed to perform, and this was dictated by the local area health service.

Average surgical and clinic waiting times ranged from 2.5 to 15 months.

Funding source

Multiple funding sources contribute to the outreach eye services in Australia.

The proportions of funds from different sources varied between the regions (Fig. 7). All regions had contributions from State and Federal sources. Relative to each other, there was a range from 8.4% Federal contribution in the Kimberley to 60% in NSW. The 'other' contributions included non-government organizations such as the Fred Hollows Foundation (FHF) and the International Centre for Eyecare Education (ICEE) who act as advocates for eye health particularly in servicing Indigenous communities. Private and corporate funding also supports services in some jurisdictions.

Cost-effectiveness

There is greater than a threefold increase in costs per patient when comparing the most expensive and least expensive services. There is an eightfold range in costs per person in a region (per capita) (Table 1).

Funding models

The main funding models used in surveyed regions were FFS or salary/sessional rates. Regions varied mainly according to these two systems, which may be applied to surgical services and/or clinic attendances.

Some regions had hybrid models of varying complexity. For example in the NT there were systems for billing Medicare per outpatient attendance. Funds were collected by a private practice trust fund and ophthalmologists receive a capped portion of their base salary (30–35%). The reimbursement is effectively independent of throughput as the system is capped at a much lower rate than the true billings.

The hybrid model used in SA outreach is for outpatient consultations only and includes a safety-net to allow for the rare occasion when unforeseen events result in a very low patient attendance for the day. Doctors use FFS for each attendance, but if the daily threshold is not reached an invoice is sent to the AMS for the difference.

In those regions with FFS for surgery, there were different fees depending on whether a State or Medicare rebate is applied. In Queensland, the surgical fee was a Medicare rebate whereas for WA and NSW surgery the State fee is approximately 50% above the Medicare rebate.

Quantitative analysis of funding models

An analysis comparing clinical activity based on funding model structure was performed (Fig. 8). FFS surgical reimbursement improved surgical throughput 3.2 times ($t = 2.91$, $P = 0.023$) and clinic throughput by 2.3 times ($t = 2.40$, $P = 0.047$). The waiting time was also improved with a 58% reduction

Table 1. Summary of clinical activity, cataract surgery rates and cost-effectiveness

Region	Clinic patients/week	Surgical patients/week	Waiting time (months)	CSR	CSR (ATSI)†	Cost/attendance‡	Cost/capita§
Cape York	87	16	5.25	4960	8600	895	29
Great Southern WA Outreach	97	9	7	3800	N/A	411	18
Kimberley	75	5	4.5	1500	3000	496	12
Longreach loop	120	15	4	6400	N/A	353	20
NSW (OES)	65	4	2.5	1900	N/A	668	21
NT Central Outreach	32	6	7	3800	6700	1135	47
NT Top End Outreach	13	1	15	900	1700	908	17
Pilbara	145	12	3	1100	4200	420	6
SA (IES)	84	3	9	2000	5700	N/A	N/A
Mean	80	7.8	6.4	2929	4983	661	21

†CSR (ATSI): the cataract surgery rate when the number of Indigenous patients having cataract surgery is calculated for the Indigenous population in the region. ‡Total costs of ophthalmology services in a region divided by the number of patient attendances (surgical and clinic). §Total costs of ophthalmology services divided by the total population of the region. N/A, not applicable.

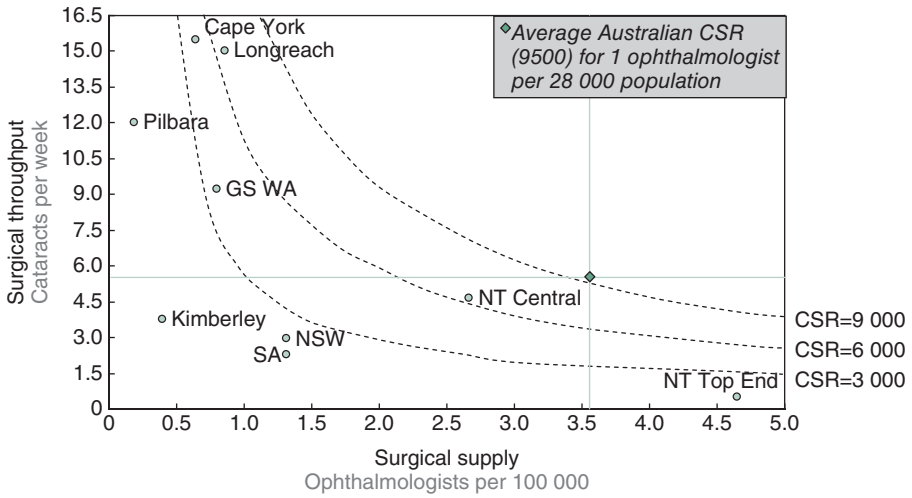


Figure 6. Schematic demonstrating effects of surgical efficiency and ophthalmologist supply on cataract surgery rates (CSR). Threshold CSR 3000 = WHO recommendation to eliminate preventable blindness (<3/60 bilaterally) in developing countries, CSR 6000 = estimate of CSR to eliminate vision impairment at 6/12 bilaterally (driving vision); Australian national CSR is 9500 (RANZCO).

($t = -2.08$, $P = 0.076$). In addition, the cost per attendance was almost halved ($t = -1.54$, $P = 0.17$).

Fee-for-service clinic consultation reimbursement had 2.5 times higher clinic throughput ($t = -2.75$, $P = 0.02$) and 2.5 times higher surgical throughput ($t = -2.08$, $P = 0.03$) than salaried funding arrangements. There was a trend towards reduced waiting times (40% shorter) and cheaper attendance (35% less) ($t = 1.11$, 1.39, $P = 0.19$, 0.12, respectively).

Qualitative analysis of reimbursement systems

Funding could better recognize the challenges of outreach ophthalmology, such as maintaining base practices and working in the less efficient and difficult circumstances in very remote regions.

> Covering base costs is the biggest problem for outreach services, especially solo practitioners – WA.
>
> If there was a subsidy for base practice costs while doing remote work, then bulk-billed service in remote areas more feasible – Qld.
>
> If relying on charity from individual ophthalmologists, then service will not be sustainable – NSW.
>
> Need to ensure that outreach is not a financial burden on the participating service providers – Qld.

There were suggestions for incentive payments:

> Consider being able to bulk-bill 115% rebate for very remote services due to low efficiency and numbers of patients in outreach compared to urban practice – Qld.
>
> Rural Retention Program for GPs works well as no audit/admin and rewards for total billings for year, but needs to be adapted for specialists – Qld.

The complex funding mechanisms and various government sources create confusion and lack transparency when establishing a service or meeting demand in existing services:

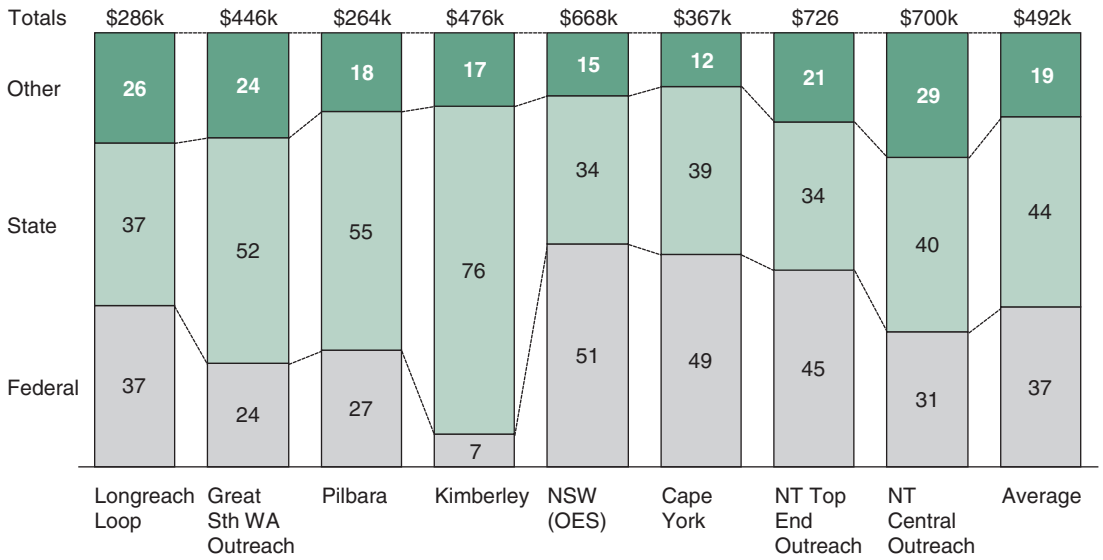
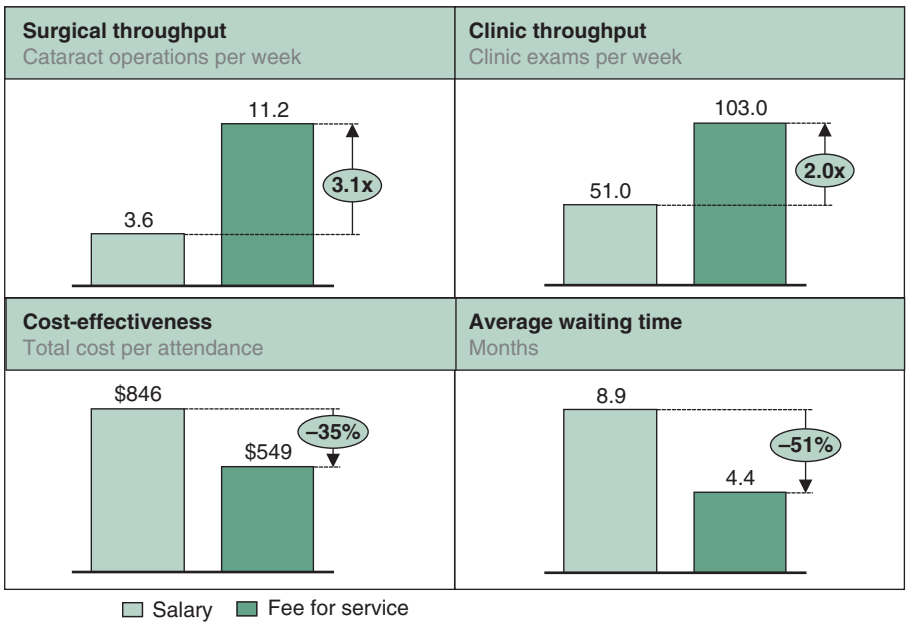


Figure 7. Funding sources. 'Other' includes non-government organizations, corporate sponsorship, private funding and patient fees. 'State' includes clinic/surgical infrastructure and consumables, some travel/accommodation, local area health services. 'Federal' includes Medicare, Medical Specialist Outreach Access Program (MSOAP), regional eye health coordinators (OATSIH).

Figure 8. Comparison between services according to funding model used for surgery.



> There's a three-way blame game between State, Local Area and Federal health services regarding the funding of eyes and how much surgery is done – NSW.

Discussion

This study demonstrates that FFS payment systems may result in increased efficiency and activity of clinical services. There are also trends towards decreased waiting times and improved cost-effectiveness when compared with salaried systems for Australian outreach ophthalmology services.

Interviews with service providers revealed a common theme suggesting incentives are required to make reimbursement for outreach work comparable to urban practice, recognizing challenging case load, travel time and base practice costs.

There is limited research relating to funding models and payment systems for specialist services and none specific to *outreach* specialist services that has been identified in the literature.

There was greater than a threefold increase in costs per patient when comparing the most expensive and least expensive services. Isolation, accessibility and size of communities may alter the cost-effectiveness significantly. The 'value for money' of an outreach service also depends on the performance of the service. For example, although the NT Top End outreach and Cape York have similar cost-effectiveness, there are large differences in surgical throughput and waiting times

Nine of the 12 regions in Australia with outreach ophthalmology services were included in this study. Despite including the majority of outreach services, the sample size was not large enough to detect all possible associations related to type of funding model and it is not possible to perform multivariate analysis for confounders such as the proportion of Indigenous patients, given the small sample.

The method by which physicians are paid may affect their clinical and professional behaviour.[5] In theory, by altering payment systems, the quality of care, cost containment and recruitment to underserved areas may be improved. A Cochrane review studying primary care physicians found that FFS results in more patient visits, greater continuity of care, higher compliance, but that patients were less satisfied with access to their physician compared with salaried payment.[6]

Under salary systems, doctors are paid an annual salary for a set number of hours per week per year. The doctor therefore knows in advance the payment they will receive before any care is provided. Another prospective payment system known as capitation (payment per patient registered in physician's care) was not encountered in this case study. FFS systems reimburse the doctor per item of service (MBS rebates), and occur after the care has been provided. Evans[7] describes a risk to incentivized payment systems called 'supplier induced demand' where there is a tendency for patients to receive more care than they would have otherwise required. Woodward and Warren-Bolton[8] suggests that where physicians respond to these incentives, salaried payments may encourage cost-containment behaviours and result in under-treatment whereas FFS may encourage over-treatment.[8] In this case study, neither of these effects were evident. Even in FFS regions none reached the national average CSR. In fact many regions did not even reach the minimum WHO-recommended CSR of 3000 needed to eliminate preventable blindness (<3/60 OU) in developing countries.[9] This suggests a large potential unmet need, which is reflected in the population-based prevalence data that have quantified this demand. Blinding unoperated cataract is the cause of 31% of blindness for Indigenous adults and is 12 times higher than mainstream.[10] The number of cataract operations is approximately 1200 per year in Indigenous communities. To reach the Australian average CSR, approximately 4300 cataract operations should occur per year. The unmet need is therefore to increase current surgery numbers by around 3000 cases per year.

There is a risk that 'market forces' in an FFS system will result in certain communities or groups being neglected if FFS reimbursement is not financially attractive to health providers. Outreach work in remote and Indigenous communities presents well-recognized barriers to providing efficient and high-volume clinical services.[4,11]

Acknowledging these barriers, appropriate incentives should be introduced to provide sustainable and equitable reimbursement for outreach specialist visits to compare with city practice. This would result in the inherent efficiencies and cost-effectiveness of an FFS model, while shielding vulnerable and disadvantaged communities from market forces. The issue relating to the size or remoteness of an isolated community that warrants secondary specialist ophthalmology visits as opposed to primary screening by an optometrist requires further evaluation and is not dealt with in this analysis.

For outreach ophthalmology services in Australia, the funding model used for clinician reimbursement may influence the clinical throughput, waiting times and costs. In this case study, the outpatient consultations and surgical throughput were increased if an FFS model was used for surgery. Safety-net funding options or differential funding/incentives need further evaluation to ensure viability of outreach services to isolated areas prone to unpredictable or poor patient attendance. In order for ophthalmology outreach services to be sustainable, remuneration needs to be comparable to urban practice.

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