Hospital-based glaucoma clinics: what are the costs to patients?

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Abstract

Aim   To investigate the costs to patients attending hospital-based glaucoma clinics.
Methods   A patient-based costs questionnaire was developed and completed for patients attending six ophthalmology units across London (Ealing General Hospital, St Georges Hospital, Mile End Hospital, Upney Centre Barking, St Ann's Hospital and the Royal London Hospital). The questionnaire considered age, sex, ethnicity as well as patient-based costs, opportunity costs, and companion costs. All patients visiting for review or appointments were approached non-selectively. A total of 100 patients were sampled from each unit.
Results   The mean age of the full sample was 69.6 years (SD 12.6), with little variation between sites (68.5–71.8 years). There was an almost equal sex distribution (male (298 (50.6%)). There was no major difference in occupational distribution between sites. The majority of people came to hospital by bus (40%) or car (26%). Female patients went slightly more by cab or car, whereas male patients went slightly more by foot or train. There was some variability in transport method by site. The data showed that the Royal London hospital had the highest mean cost per visit (£16.20), whereas St Georges had the lowest (£12.90). Upney had the second highest mean cost per visit (£15.20), whereas Ealing and St Ann's had similar mean costs of (£13.25) and (£13), respectively. Travel costs accounted for about one-fifth of the total patient's costs. For all glaucoma clinics, total societal costs were higher than the sum of patients' costs because of the high frequency of companions. A surprising finding was that two-thirds of the population (392 or 66.6%) reported no qualification–considerably higher than the national census statistics for the same population.

Conclusions   To our knowledge this paper presents direct and indirect patient costs in attending hospital glaucoma units for the first time. It highlights the significance of opportunity costs when considering health-care interventions as they amount to a third or more of the total costs of patient attendances to clinics.

Introduction

The number of people coming to hospital eye departments is likely to increase in the future, as a result of an ageing population, increased optometric case finding, and raised public awareness. This fact coupled with the increased economic pressures in health-care financing, and the relative shortage of ophthalmologists in the United Kingdom is going to put a significant strain on ophthalmology provision.[1]

As a result of these issues, there is a push by the government to move eye care into the community and to have more primary care involvement.

A variety of alternative models have been proposed for patient care in the community. An important part of assessing such models is to estimate their relative cost effectiveness. As a contribution to these calculations, this paper reports on a study to estimate the costs incurred by patients attending hospital-based clinics in the London area.

Materials and methods

Starting with the cost questionnaire for completion by patients developed by Wordsworth and Thompson,[2] we undertook a pilot study. This demonstrated a need for more

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information in our setting. In addition to demographic details for patients, further fields were included to detail travel costs, opportunity costs, and companion costs. The final questionnaire content is shown in Appendix 1. Ethnicity was coded according to the NHS information standards board. Bangladeshi was coded under Pakistani. Occupation was coded according to the national statistics socio-economic classification (NS-SEC): the standard occupational classification 2000.

For this patient survey, verbal consent to participate was obtained from each patient. Data were collected using ID numbers and date of birth only. The data set was kept encrypted according to normal NHS standards. Six ophthalmology units across London (Ealing General Hospital, St Georges Hospital, Mile End Hospital, Upney Centre Barking, St Ann's Hospital, and the Royal London Hospital) were studied. Clinics were visited on 12–18 occasions with data collection from 7–8 patients per clinic, until a quota of 100 patients were sampled from each unit. Patients visiting for review or appointments were approached by convenience sampling. The structured questionnaire (Appendix 1) was completed by interview in a private room. Data were double entered using the EpiInfo program (WHO v.3:4:1). Contingency tables and costs analysis were undertaken using Intercooled Stata 7.0 (Stata Corporation, College Station, TX, USA).

Results

Data were collected for a total of 100 patients from each site with the exception of The Royal London Hospital, where 97 were sampled. Owing to the sampling methodology, repeat data collection occurred in seven patients. This afforded an opportunity to investigate the repeatability of responses within patients. The analysis of these repeat responses showed that there was no difference in their responses to the questions on highest qualification and employment type. Six of the seven patients used the same mode of transport to and from the hospital on each visit. There was one patient who used a bus and train combination for the initial visit but used just a bus for the second visit. Six of the seven patients were accompanied on both visits. In three instances, the person who accompanied the patient was employed. In these three, the responses differed between visits as to the method of time taken off (loss of income *vs* paid leave).

The mean age of the full sample was 69.6 years (SD 12.6), with little variation between sites (68.5–71.8 years). There was an almost equal sex distribution (male (298 (50.6%)) with some variation between sites (40–58% male). The current and past occupation is shown in

Table 1 Present/past occupation of patients attending hospital glaucoma clinics in London

Occupation	Working population, N (%)	Retired population, N (%)
Managers/professionals	27 (21)	47 (10)
Associate professional/admin/secretarial	30 (23)	98 (21)
Skilled trade/service (personal/sales)	44 (35)	192 (42)
Machine operatives/elementary	22 (17)	130 (28)
Unemployed	6 (5)	0 (0)
Total	129	467

Table 1. No major difference in occupational distribution was seen between sites.

The majority of people came to hospital by bus (40%) or car (26%). Female patients went slightly more by cab or car, whereas male patients went slightly more by foot or train. Understandably there was some variability in transport method by site (Table 2). Car and bus were commonly used at Ealing and St Ann's. Car (42/98 (43%)) was frequently used at Upney, and bus (57%) was frequently used at St Georges. There was more of a mix at the other sites. The results did not suggest any link between ethnicity and mode of transport.

There was, however, a clear difference in ethnic composition between sites; Ealing having more of Asian origin and St Georges, Mile End, and St Ann's having more of African or Caribbean origin.

Two-thirds of the population (392 or 66.6%) reported no qualification. This was age related, being 40% in those aged less than 55 years and increasing to 80% in those aged over 80 years. Logistic regression with 'no qualification' as the outcome showed that age (OR 1.28 (1.18–1.38) $P<0.001$) and past/present occupation (OR 1.94 (1.71–2.19) $P<0.001$) were the most important explanatory variables.

Half (296 (50.2%)) of those questioned had come with someone to the outpatient department. The proportion was remarkably constant at all sites with the exception of Upney, where only a third had come with someone (36/98). Females were more likely to come with someone than males (176/291 (60%) *vs* 120/298 (40%) ($\chi^2 = 24$, $P<0.001$)). There was only a slight trend towards the older being more often accompanied, such that only 55% of those in their 80s were accompanied, however, 11/14 (79%) of those aged 90+ years were accompanied. Asians were more likely to have a companion (Indian 60%, Pakistani/Bangladeshi 57%) and Africans (33%) and Caribbean (43%) less likely. Logistic regression with regard to outpatients being accompanied by someone as an outcome showed site, age, and ethnicity not to be explanatory variables, but being a female

Table 2 Transport method and ethnicity related to site

	Ealing	St Georges	Mile End	Upney	St Anns	Royal London
Transport, N (%)						
Walking	7 (7)	17 (18)	9 (10)	11 (12)	11 (11)	10 (11)
Bus	48 (48)	57 (59)	30 (35)	28 (29)	43 (44)	27 (30)
Taxi/cab	6 (6)	1 (1)	7 (8)	6 (6)	11 (11)	7 (8)
Car	33 (33)	16 (17)	21 (24)	42 (44)	26 (27)	18 (20)
Train	0 (0)	4 (4)	10 (12)	8 (8)	2 (2)	18 (20)
Hospital	5 (5)	1 (1)	9 (10)	0 (0)	4 (4)	10 (11)
Total	99	96	86	95	97	90
Ethnicity, N (%)						
White	48 (49)	51 (51)	55 (55)	73 (74)	45 (46)	50 (54)
Indian/Pakistani	40 (41)	14 (14)	12 (12)	13 (13)	15 (15)	23 (25)
African	3 (3)	13 (13)	13 (13)	9 (9)	11 (11)	12 (13)
Caribbean	7 (7)	22 (22)	20 (20)	3 (3)	27 (28)	8 (9)
Total	98	100	100	98	98	93

(OR 2.21 (1.58–3.09) $P < 0.001$) and having no qualification (OR 1.56 (1.08–2.25) $P = 0.019$) were.

Travelling costs

Patients were asked to state mode of transport to and from the clinic. An estimate of the national motoring cost per mile (£0.55) was applied to those patients who travelled by car to the clinic (http://www.theaa.com). The motoring cost was combined with other travelling expenses, such as parking fees, public transport, taxi and mobility services costs (£0.35),[3] to establish a total travel cost per patient.

Time costs

Data were collected on employment status, and working time sacrificed for the clinic attendance was valued at the national average net wage rate per hour. The net wages were calculated from estimates of gross wages, personal income tax, and social security contribution rates.[4] Working time lost (production time lost) was also accounted for by calculating the difference between the average total labour cost (£18.78)[5] and the net wage cost to the patient.

Leisure time was used to classify a situation where a patient did not have to give up any time from work and was valued at 30% of the average gross wage (http://www.hm-treasury.gov.uk/data_greenbook_index.htm).[6] The same value for leisure time was also used for patients not in paid employment (eg, retired patients).

Time cost of companions was also taken into consideration. Working and non-working time were valued in the same way as described earlier for the patients. The time spent in the glaucoma clinic was estimated at 2 h. All financial estimates (£) were based on 2006 prices.[7]

Cost analysis

The total patient cost per visit was calculated by adding together the travelling costs and time costs. The total societal cost per visit was calculated by adding together the cost of travelling for patients with free passes, costs for patients and companions working, and leisure time. These two totals were then used to calculate a mean cost per glaucoma clinic visit for each of the Moorfields outreach clinics and the Royal London hospital.

The Royal London hospital had the highest mean cost per visit (£16.20), whereas St Georges had the lowest (£12.90). Upney had the second highest mean cost per visit (£15.20), whereas Ealing and St Ann's had similar mean costs of (£13.25) and (£13), respectively (Table 3).

The Royal London highest mean cost per visit seems to be the result of it having the highest total patient cost per visit (£12.10) and the highest societal cost per visit (£20.30) compared with other clinics. In addition to having the lowest mean cost per visit, St Georges also had the lowest total patient cost per visit (£9.40). This was due to St Georges having the lowest patient travel cost of (£1.80) of all glaucoma clinics.

St Georges, however, had the second lowest societal cost per visit (£16.40). St Ann's actually had the lowest societal cost per visit of (£15.80).

The total societal costs were higher for all the glaucoma clinics compared with total patient costs, this appears to be driven by the larger companion attendance.

Discussion

The recent NICE report on diagnosis and management of chronic open angle glaucoma and ocular hypertension along with previous work comparing the costs of monitoring patients in hospital *vs* community

Table 3 Mean cost per glaucoma clinic visit

	Ealing	St Georges	Mile end	Upney	St Anne	Royal London
Patient costs						
Travel cost	3	1.8	3.8	4.9	3.2	4.7
Working time	2.4	3.6	3.2	2	2.6	3.4
Leisure time	4.4	4	4.2	4.6	4.4	4
Total (£)	9.8	9.4	11.2	11.5	10.2	12.1
Societal costs						
Travelling cost	0.8	1.1	1.7	1	0.8	1.4
Working time (productivity loss)	2.5	2.4	1.9	1.8	2.3	2.5
Working time (companions)	5.6	4.4	6.5	8.5	4.9	8.2
Leisure time (companions)	1	0.9	0.8	1	0.8	0.8
Total (£)	16.7	16.4	18.3	18.9	15.8	20.3
Mean cost (£)	13.25	12.9	14.75	15.2	13	16.2

optometrists highlights the paucity of data on economic aspects of glaucoma care.[8–10]

Our findings show a moderately narrow range of mean cost estimates for single outpatient attendance in an inner city environment (£12.90–£16.20 across six sites). This suggests some robustness in our estimate for an urban environment. Clearly, this may well vary in suburban and rural environments, and further work is required in other settings to investigate the generalisability of these findings.

A surprising finding was the high proportion of patients attending the glaucoma clinics who reported no academic qualification (66.6%). This compares with 2007 national statistic of 11.4%. Association of lack of qualification with age in our population agrees with the national findings, which also show this trend (7.6% in 25–29 years age group, 20.1% in 55–64 years age group).[11]

To our knowledge, this paper presents direct and indirect patient costs in attending hospital glaucoma units for the first time. Travel costs accounted for about one-fifth of the total patient's costs. For all glaucoma clinics, total societal costs were higher than the sum of patients' costs because of the high frequency of companions.

Summary

What was known before
- No previous research on patient costs involved in attending hospital glaucoma clinics.

What this study adds
- This is the first work of its kind on patient costs in attending hospital glaucoma clinics.

Conflict of interest

The authors declare no conflict of interest.

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Appendix 1

Site: Patient Costs Questionnaire.

Subject ID

Date of birth

Todays date

Sex?
1=Male, 2=Female

Ethnic category?
1=White, 2=Eastern Asian, 3=Indian, 4=British Indian, 5=Pakistani, 6=BritishPakistani, 7=African, 8=Caribbean, 9=Turkish, 10=other

Highest qualification attained by full time students and school children?
1=None,2=1+O level passes;1+CSE/GCSE any grades;NVQ level 1;Foundation GNVQ. 3=5+O level passes;5+CSEs(grade 1's);5+GCSEs(grades A-C);School Certificate; 1+ A levels/AS levels;NVQ level 2;Intermediate GNVQ. 4=2+ A levels;4+ AS levels;Higher School Certificate;NVQ level 3;Advanced GNVQ. 5=First degree; Higher degree; NVQ levels 4 and 5; HNC;HND;Qualified Teacher Status;Qualified medical doctor;Qualified Dentist; Qualified Nurse;Midwife; Health Visitor.6=Other.

Which activities are you currently involved in?
1=Paid work <=20 hrs per week, 2=Paid work > 20hrs per week, 3=Student part-time, 4=Student full-time, 5=Volunteer work <=20hrs per week, 6=Volunteer work > 20hrs per week, 7=Retired, 8=None, 9=Other, 10=Unemployed.

Employment type?
1=Managers and senior officials, 2=Professional occupations, 3=Associate professional and technical occupations, 4=Administrative and secretarial occupations, 5= Skilled trade occupations, 6=Personal service occupations, 7=Sales and customer service occupations, 8=Process;plant and machine operatives, 9=Elementary occupations, 10=Retired, 11=Unemployed

If retired, what was your past occupation?
1=Managers and senior officials, 2=Professional occupations, 3=Associate professional and technical occupations, 4=Administrative and secretarial occupations, 5=Skilled trades occupations, 6=Personal service occupations, 7=Sales and customer service occupations, 8= Process;plant and machine operatives, 9=Elementary occupations, 10=Not applicable

Which transport method did you use to arrive at the hospital?
1=Walk, 2=Bus, 3=Cab/Taxi, 4=Car, 5=Train, 6=Hospital transport, 7=More than one

If more than one method of transport was used, please specify combination:
_____

Did you come alone?

1=Yes, 2=No

If no, what is the
occupation of the person
that came with you?

1=Managers and senior officials, 2=Professional occupations, 3=Associate professional
and technical occupations, 4=Administrative and secretarial occupations, 5=Skilled
trades occupations, 6=Personal service occupations, 7=Sales and customer service
occupations, 8=Process; plant and machine operatives, 9=Elementary occupations,
10=Retired, 11=Unemployed, 12=Not applicable, 13=other.

What was the reason for
the patient being
accompanied by the other
person?

1= Mobility reasons, 2=Translation reasons, 3=Moral support, 4=Disability reasons,
5=Not applicable.

Cost of travel?   Bus Fare:_____,If free pass distance travelled:_____
                   Train Fare:_____,If free pass distance travelled:_____
                   Taxi Fare:_____
                   Car: mileage:_____ ,car park charges:_____ ,congestion
                   charge:_____
                   Hospital transport mileage:_____

Cost of travel (One way to the hospital)?_____

Travel time (One way to the hospital)?_____

Are you going back the
same way you came?

1= Yes, 2=No

If no, what is the transport
method you will using for
your return journey?

1= Walk, 2=Bus, 3=Cab/Taxi, 4=Car, 5=Train, 6=Hospital transport, 7=More than one
8=Not applicable.

If more than one method of transport was used, please specify combination:
_____

Cost of return journey?   Bus Fare:_____,If free pass distance
                          travelled:_____
                          Train Fare:_____,If free pass distance
                          travelled:_____
                          Taxi Fare:_____
                          Car: mileage:_____,congestion charge:_____
                          Hospital transport mileage:_____

Cost of return journey (One way from the hospital)? _____

In summary the total cost incurred for the hospital visit (two way journey to and from the
hospital) by the patient was:_____

Total cost agreed with patient

In terms of other expenses incurred:

Was any time taken of
work in order to attend
the appointment?

1=Yes , 2=No

Who took the time off
work?

1=Patient, 2=Person who accompanied patient, 3=Both, 4=Not applicable

If the patient took time off work:

Was it taken as sick pay
or loss of earnings?

1=Sick pay, 2=Loss of earnings, 3=Not applicable

Was it taken as a full day
or half day?

1=Full day, 2=Half day, 3=Not applicable

How much money was lost, if there was loss of earnings for the
patient?_____

If the person who accompanied the patient took time off work:

Was it taken as sick pay
or loss of earnings?

1=Sick pay, 2=Loss of earnings, 3=Not applicable

Was it taken as a full
day or half day?

1=Full day, 2=Half day, 3=Not applicable

How much money was lost, if there was loss of earnings for the accompanying
person?_____

Were there any other reasons that expenses were incurred in order to attend the
appointment?

1=Yes   2=No

Eg: Nanny expenses, baby sitters, house sitters for other dependent relatives.

Reason:_____cost:_____

Reason:_____cost:_____