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Screening for sexually transmitted diseases: The importance of time and travel costs incurred by patients

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Abstract

This study estimates the time and travel costs incurred by individuals who attend for treatment for a sexually transmitted disease following a home based screening programme. These costs are compared with those incurred by patients attending a clinically based screening programme. Following home based screening, individuals identified as positive are called for results and treatment at their local GP surgery in the localities of Bristol and Birmingham. Questionnaires requesting information on mode and cost of travel, loss of earnings and activities foregone as a result of attending, were completed by patients awaiting treatment at the surgery.

Interim results based on the first 300 questionnaires showed that approximately half the patients were in paid employment. On average the time taken to travel to clinic was 12.76 minutes. The mean cost to patients who attended for treatment, based on travel and opportunity cost of their time, was approximately £12.

The average costs to individual patients who participate in a home based screening programme are 50% less than those reported for individuals in clinically based screening programmes. The overall costs to society are also comparatively reduced because costs are only incurred by infected individuals. Although reduced by home based screening, the personal costs incurred by individuals will still have important implications for the economic analysis. These costs add to the difficulties of low uptake already apparent in screening programmes, which are further compounded in the area of sexually transmitted diseases due to the stigma attached to the disease.

Introduction

It is widely accepted that the preferred approach to an economic evaluation is one that is carried out from the societal perspective. Although the largest burden of costs associated with any health care programme are usually borne by the Health Service, in the process of accessing healthcare, patients frequently incur out of pocket costs related to travel expenses, childcare costs and also time costs. The implication of this time lost is that they are forgoing activities which are of value to them and to society. These costs typically fall on the patients themselves in terms of lost income, forgone study, childcare, and lost leisure time, although they may also fall on the employer in terms of lost output.

Population screening programmes in particular have the biggest potential for imposing private costs, and on a large number of individuals many of whom are unlikely to have the disease in question. The costs incurred by individuals may have an effect on the utilization of health care in general and uptake of screening specifically. Individuals may experience difficulty estimating benefits of preventive care, against the immediate travel and time cost associated with attendance. This is especially true for screening programmes, because individuals often experience no current symptoms and the benefits are often in the longer term (Haiart et al 1990). These difficulties may be further compounded in the area of sexually transmitted diseases due to the stigma attached to the disease.

Chlamydia trachomatis is one of the most commonly transmitted sexual infections in developed countries. The asymptomatic nature of the disease means that treatment is often delayed,

leading to increased risk of complications and transmission to partners. Since treatment for chlamydia trachomatis is available, screening is a way of reducing the costs and burden associated with the disease. Different approaches to screening are currently being considered by policy makers.

A systematic review of the literature on screening for chlamydia trachomatis under taken as part of the Chlamydia Screening Study (ClaSS) (ClaSS study 2002) revealed over 50 economic evaluations. Many of the studies were from the health service perspective, those that adopted a societal perspective incorporated the patient costs associated with the long term effects of chlamydia trachomatis, rather than the patient costs associated with attending the GP surgery or clinic to undergo screening, treatment and partner notification.

This paper reports the time and travel costs incurred by patients attending screening for chlamydia trachomatis. This work forms part of the wider Chlamydia Screening Study (ClaSS) which is an evaluation of the clinical and cost-effectiveness of home-based population screening for chlamydia trachomatis in the UK. This study is the first home based study to be conducted in the UK; results will be compared with other studies which have evaluated the private costs associated with other health care screening programmes (Sculpher & Buxton 1993, Bryan et al 1995, Frew et al 1999, Henderson et al 2002).

Methods

Recruitment

A random sample of 18,000 men and women, aged 16-39 years, were selected from 27 GP practices in Bristol and Birmingham between February 2001 - November 2002. Research packs, which were preceded by a letter from the GP, were sent to the homes of the identified individuals. Men and women were asked for a first void urine sample. Women were also asked to provide a vulval vaginal swab. Samples were returned to the Public Health Laboratory Service (PHLS) in a prepaid addressed envelope, which was included in the packs.

Diagnosis of infection

Samples were tested at pubic health laboratories in Bristol and Birmingham with each laboratory using two out of 3 possible tests. Roche Cobas PCR and enzyme-linked immunoassays (EIA) were the tests used in Bristol. Becton Dickinson Probe Tec SDA and EIA were the tests used in Birmingham.

Reporting results to patients

For the purpose of the study all positive patients and a sub sample of the negative patients were asked to attend their GP surgery to obtain their test results. The remaining negative patients were informed by post. If a national home-based screening programme were to be introduced all negatives would be informed by post.

Partner notification

The design of the ClaSS study included a randomised controlled trial which compared two methods of partner notification. Individuals who are screened positive for the disease are either advised with regard to partner notification by the practice nurse when they get the results and treatment, or are asked to attend the Genitourinary Medicine clinic (GUM clinic) for partner notification advice.

On attending the GP surgery, patients could follow one of three possible pathways:

- screened negative – receive results only
- screened positive – receive results, treatment and counselling and partner notification advice at the GP Practice
- screened positive - receive results, treatment and counselling but receive referral to GUM clinic for partner notification advice.

Patient cost questionnaire

All patients attending for results and treatment at their GP surgery were asked to complete a patient cost questionnaire (see Appendix 1). The questionnaire was adapted from one used to collect costs of women attending a routine ultrasound screening programme and would allow an opportunity of comparing the private costs of patients attending two completely different screening programmes. The questionnaire collected the following information:

- mode of transport
- cost of travel
- time taken to travel

- time spent in surgery
- paid or unpaid time off work
- childcare costs
- opportunity cost of attending surgery

Travel data

Information on patient's mode of transport, to and from GP surgeries, and out-of-pocket expenses such as car-parking, petrol and payment for public transport were obtained.

Costs for private car travel were calculated using published Automobile Association (AA) motoring costs. The estimate used in this study was 40.83p per mile. These costs include allowances for fuel, taxation, capital depreciation, servicing and repairs for a petrol car of 1550-2000 cc, with annual mileage 15,000 and current cost of petrol 74.8p per litre. Walkers and cyclists were assumed to have incurred no out-of-pocket expenses. Information is not currently available on the distance patients travel to and from the surgery, but is being sought from study data. For the purpose of this paper, an arbitrary figure of 3 miles was used.

Time data

Information on the time patients spent travelling to and from the GP surgeries, and time spent at the surgery were collected. This data was used to calculate the total imposition on an individual's time as a result of the screening programme and thus estimate the opportunity cost, in terms of activities forgone, as a result of screening.

Activity forgone

The opportunity cost of time lost from work was estimated from the mean gross weekly wage rate for men and women in Great Britain at April 2001, which was £426.85. Minus tax, pension and national insurance contributions (estimated at 35% of gross salary), the average hourly rate for a 37.5 hour week would be £7.40.

Patients, who were not in paid employment but would have spent their time studying or looking after children, were considered in the base case scenario to have an opportunity cost approximating that of the minimum wage in England and Wales for 18-21 year olds (£3.60). When patients reported 'Other' as the activity forgone the activity was classified as 'leisure time' and valued at 40% of the mean average wage (i.e. £2.96). This was based on previous estimates reported in the literature (Henderson et al 2002).

Sensitivity analysis

Sensitivity analysis will be used to explore the effects that changes to the key assumptions made in the valuation of patient costs would have on the overall average patient cost. Key assumptions made were:

- that those not in employment had an opportunity cost equivalent to that of the minimum wage in the UK;
- that the average rate of pay for the UK was appropriate for this population;
- that the average distance traveled was 3 miles;

- that all car travelers had a petrol fuelled engine of 1550-2000 cc, did an annual mileage of 15,000 and used unleaded petrol at 74.8p per litre.

Results

Data from 256 questionnaires have been data entered and are available for analysis so far. We have received a total of 413 questionnaires from 479 patients (response rate = 86.2%) but data entry on these is not yet complete.

Travel Time

Figure 1 and Table 1 illustrate the mode of travel used by patients. The majority of patients 44.36% (114) traveled by car to the GP practice, 42.41% (109) walked 10.8% (28) used public transport and 2% (5) came by bicycle.

When the final study data are available, it will be possible to estimate the distances travelled by car users by means of mapping patients postcode to surgeries. In the meantime an average distance of 3 miles, which included the return journey, was applied to all patients who travelled by car to the GP surgery. Applying the unit cost of 40.83 per mile for car users to the estimated distances, the estimated cost of car travel to and from the GP surgery was estimated at £1.22 per patient. The unit motoring cost assumed were appropriate for 1100-2000 cc vehicles travelling 10,000 – 15,000 miles each year. Patients travelling in cars with larger capacity or with lower annual mileage would incur greater costs.

For the 10.8% (28) of patients who travelled by public transport, the average cost was estimated to be £2.52 for the return journey. The cost of travelling to the surgery by bicycle or on foot was assumed to be zero.

Surgery time

The average time spent in GPs surgery (including waiting and consultation time) was 32.83 minutes (range: 3 - 115 minutes). The average time patients spent travelling to and from the surgery was 25.59 minutes (range: 4 - 130 minutes) Table 2.

Thus the total time (travelling, waiting and in consultation , at the General Practice) imposed upon individuals as a result of the screening programme, was estimated to be approximately 58.42 minutes per patient.

Opportunity Cost

Figure 2 and Table 3 present the activities foregone by patients. If they had not been attending the GP practice for results, almost 43% (110) reported that they would have been in paid employment, 19% (49) patients said they would have been studying and 7.8% (20) stated they would have been looking after children. Approximately 30% (77) of patients described their activities forgone as 'Other' (classified as leisure time forgone).

Lost pay

Of the 43% (110) patients in paid employment, 99% (109) reported arrangements they had made with regards to taking time off work. Figure 3 and Table 4 present the work

arrangements undertaken by patients. The largest group of patients 29% (31) took paid absence; 23% (25) said they would make the time up at a later date; 23% (25) came to surgery outside work time; 17% (19) took unpaid absence and 8% (9) took annual leave.

Of the 17 % (19) patients who took unpaid absence from work 79% (15) recorded their lost income. The total lost income reported was £473.23 this amounted to an average income loss of £31.55 (range: £5-£80) for these patients (see Table 4).

Average cost per patient

The estimate of the average cost in terms of out-of-pocket expenses related to travel and the opportunity costs associated with the time spent travelling, waiting in surgery and in consultation is £5.82 per patient, for the 256 questionnaires analysed (see Table 5).

This cost includes an estimate of the opportunity cost based only on the time spent in the surgery and travelling to and from the surgery. It may therefore be an underestimate of the total wages lost, because many patients may travel extra distance to return to work or may have taken a morning off work to attend their appointment. This may be supported by the fact that the average income loss reported by patients (£31.57) was higher than the overall average loss reported in this study.

Limitations to these preliminary results

For the purposes of the study only, a sub sample of patients who screened negative for chlamydia are called back to the surgery for their results and to complete a lifestyle

questionnaire. In practice all negative patients would be informed by post. It is likely that patients who screened negative for the disease will spend a shorter period of time at the surgery than positive patients who will spend additional time receiving treatment. Thus the negative patients could bias the estimates of the costs associate with time spent in the surgery downwards. In the final analysis, patients who screened negative for the disease will be separated out for the purposes of estimating their time at the surgery.

On the other hand, it is suggested in the literature that a higher prevalence of chlamydia trachomatis is associated with lower social class. If this proves to be true for the ClaSS study, the inclusion of negative patients in our analysis could over estimate the opportunity costs associated with time off work and lost income and thus overstate total patient costs. The ClaSS study is collecting information on the socio-economic status of participants as part of the study. This will allow us to explore the links between socio- economic status and disease prevalence and remove any bias caused by the inclusion of negative patients.

The screening study includes a randomised controlled trial which compares two different methods of partner notification. Individuals who randomised to receive partner notification by the practice nurse at the surgery are likely to have an even longer consultation than positive patients who are just receiving treatment. Thus, in the final analysis we will also separate out the positive patients according to where they had partner notification. Although the time spent in consultation for those patients receiving both treatment and partner notification together will be greater, the overall patient costs are likely to be less than costs for the positive patients, who are

referred to the GUM clinic for partner notification. This is because those who receive partner notification at the GUM clinic will incur time and travel costs for two separate occasions, the initial visit for results and treatment at the GP surgery and the subsequent visit to the GUM clinic for partner notification advice.

Sensitivity analysis

A full sensitivity analysis will be carried out when all the data are available.

Discussion and conclusion

The ClaSS study is the first to investigate the cost-effectiveness of a home based screening programme for chlamydia trachomatis in the UK. The advantages of a home based screening programme are that the private costs to individuals are likely to be less than those imposed by other screening methods. This is due to the fact that costs imposed on those who are screened negative are negligible compared with screening programmes that require all individuals to attend the clinic or surgery for the initial screening test. The private cost to patients who are screened positive is also likely to be reduced because they only attend for treatment and not the initial screening test. However, it is not yet clear whether the overall societal costs will be less for a home based screening programme compared to other screening methods, this is due to the operating and administration costs associated with sending out packs and postage etc, that are borne by the National Health Service. These issues will be reported in the final study.

This paper reports the patients' costs incurred whilst attending the GP surgery for results, treatment and partner notification advice as appropriate. The average cost incurred by patients involved in the study was estimated to be £5.82.

This cost is lower than that reported in other studies which have estimated the costs to patients of participating in screening programmes (see Table 6). The possible reasons for this are as follows:

As discussed above, the results include the costs incurred by patients who were screened negative. It is likely that these negative patients will have incurred shorter consultation times. However, this may or may not be offset by the relationship if any, between the disease and socio-economic status, which if it exists, may imply that the opportunity costs associated with lost earnings of patients screened negative will be greater. We intend to examine both these effects when we have the complete study data.

Our estimated average patient cost of £5.82 compares favourably to the private costs reported by some other screening studies (Table 6). It is similar to the private costs reported by Bryan et al who reported a cost of £5.06 (in 2001 prices) for men attending screening for abdominal aortic aneurism at their local GP practice. Bryan et al suggest the low private costs probably reflect the older age group of the individuals being screened, which in that study were men who were mostly retired and for whom associated productivity losses were small. Our results are similar to those reported by Bryan et al for two possible reasons.

First, like Bryan et al, age is likely to have an affect on productivity losses, but in this case because chlamydia trachomatis is most prevalent in the younger age groups (16-24 years). This may imply that the associated productivity losses resulting from time off work is lower because of age related income scales. A high proportion of students in this age group may also reduce the overall costs because of a more flexible attitude to time and less rigid employment structures. Screening studies that involve populations more likely to be in full time employment as opposed to retired groups or younger groups may have higher productivity losses.

Secondly, the costs are lower for screening programmes located in GP practices compared to those located in hospital clinics, because they are typically more local. This is supported by other studies (Sculpher & Buxton 1993).

The costs imposed on patients by population screening programmes are important and should be included in economic evaluations. Our preliminary results suggest that private costs to individuals, who have participated in a home based screening programme for chlamydia trachomatis co-ordinated from the local GP practices, are lower than those imposed by more centralised screening programmes, which in the case of chalmydia trachomatis would take place at the GUM clinics. However, this analysis does not take into account patient preferences about their preferred treatment location. The stigma often associated with Sexually Transmitted Diseases could influence patient preferences and the overall private costs. For example, the reduced private costs associated with home based screening and localised treatment at the GP, may be offset by patients' preferences for a more anonymous consultation and treatment

process available at the GUM clinic. Alternatively patients may feel that more stigma is attached to GUM clinics. A qualitative study which forms an integral part of the ClaSS study is assessing these issues and these data will be reported in the final study.

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Figure 1: Mode of transport

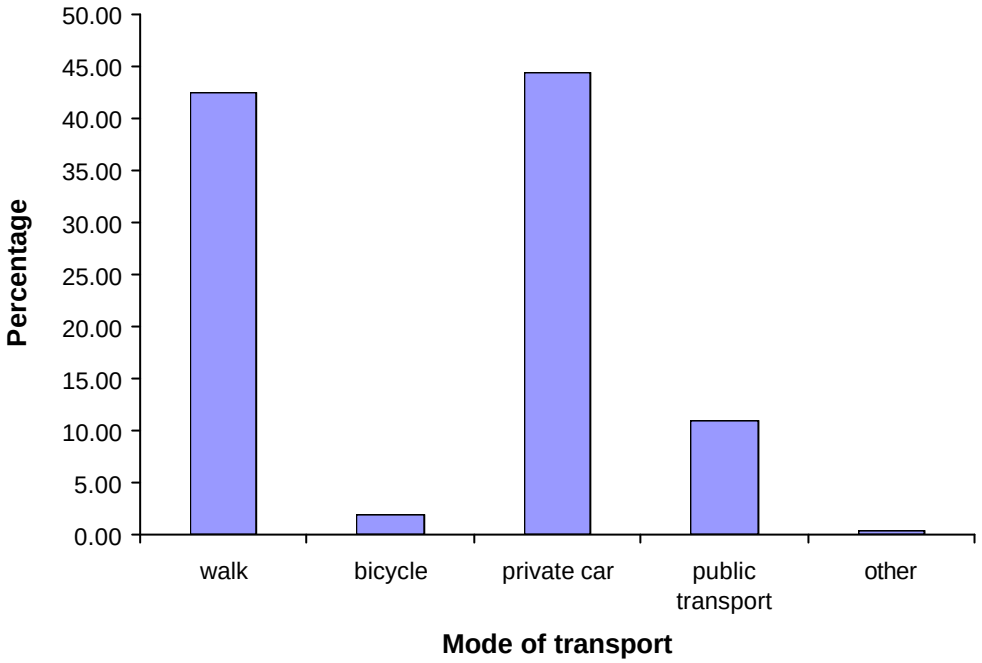


Figure 2: Patients activites forgone

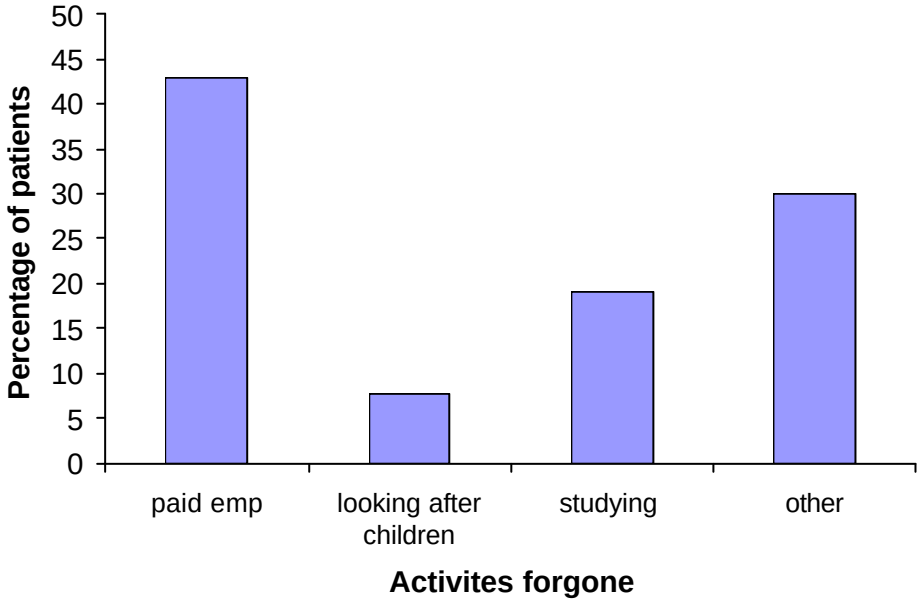
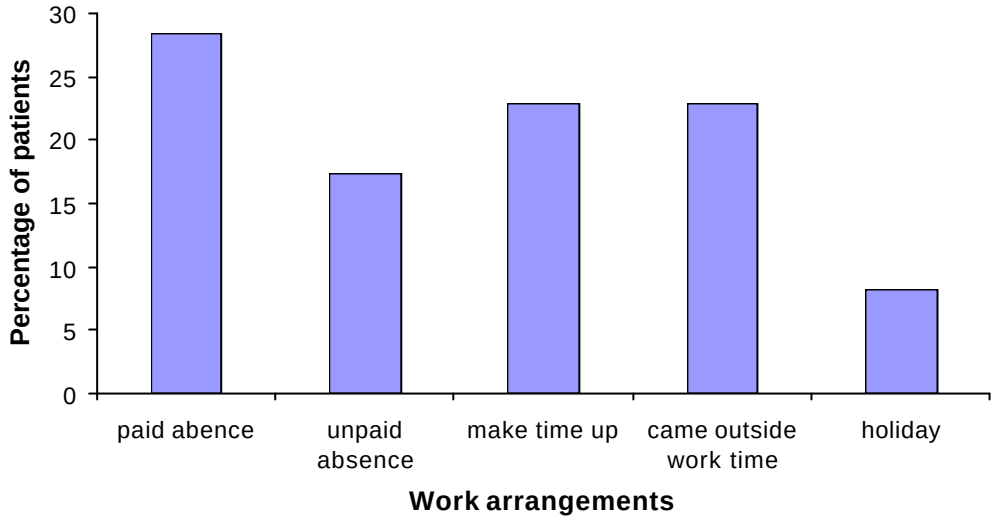


Figure 3: Work arrangements



Tables 1-6

Table 1. Mode of travel and out of pocket expenses

Mode of travel	Number	%	Cost per person
Walk	109	42.41	nil
Bicycle	5	1.95	nil
Private car	114	44.36	£1.23*
Public transport	28	10.89	£2.52
Total	256		
Car parking fees	2	1.8	£0.80

*This includes the arbitrary rate of 3 miles distance travelled per patient and the AA reported motoring cost (3miles x 40.83 pence per mile).

Table 2. Average time patients spend travelling and in GP surgery

Mode of travel	Number of patients	Average time travelling to and from surgery (mins)	Range (mins)
Walk	109	21.78	4 - 60
Bicycle	5	24.00	10 – 40
Private car	114	22.72	4 – 120
Public transport	28	52.36	10 – 130
Total	256	25.59	
Time spent in surgery	256	32.83	3 – 115
Total time (includes; travelling and surgery time)		**58.42**	**4- 200**

Table 3. Activities forgone

Activity forgone	n	%	Wage rate applied
Paid employment	110	43	£7.40
Looking after children	20	7.8	£3.60
Studying	49	19.1	£3.60
Other	77	30	£2.96
Total	256	99.9	

Table 4. Work arrangements related to paid employment

Lost pay	n	%	Wage rate applied	Average wage rates reported by patients (n)	Range
Paid absence	31	28.44	£7.40	Nil	
Unpaid absence	19	17.43	£7.40	£31.57 (15)	£5.00 -£80.00
Make time up	25	22.94	£7.40	Nil	
Came outside work time	25	22.94	£7.40	Nil	

Holiday	9 109	8.26	£7.40	Nil	

Table 5: Patient time and travel costs of attending GP surgery

Time	Average time	Range	Average cost	Range
Travel	32.83	3-115 min	£2.21	£0.20 - £16.03
Surgery time	25.59	4-130 min	£2.78	£0.24 - £9.87
Out of pocket expenses*			£0.83	£0 - £2.52
Lost income			£4.99	£0.49- £24.62
Mean total time and travel costs			**£5.82**	£0.49 - £26.57

*Average cost =time x wage rate for each patient / total number of patients

Table 6: Studies reporting the private patient costs associated with screening programmes in the UK

Author	Publication Year	Setting	Average cost reported*
Robinson & Roberts	2002	GP Practice	**£5.82**
Henderson et al	2002	Hospital Hospital	min: £9.57 max :£17.03
Frew et al	1999	Clinic	£18.59
Bryan et al	1995	Clinic GP Practice Hospital	£6.57 £5.06 £8.26
Sculpher & Buxton	1993	Hospital Hospital GP Practice GP Practice	min: £8.12 max:£11.89 min: £6.12 max:£11.91

* All cost data is inflated to 2001prices

Appendix 1. Patient cost questionnaire

Questionnaire for measuring costs to patients of attending for treatment

Thinking about your visit today:

1. What would you have been doing today if you were not attending the clinic?

Paid employment	?
Looking after children or relatives	?
Studying at school/college	?
Other	? *Please specify*_____

If you are in paid employment, please answer question 2, if not go to question 3

2. What arrangements did you make to take time off work? *(Please tick one box)*

Paid absence from work	?	
Unpaid absence from work		?
Will make the time up	?	
Came to clinic outside work time	?	
Took holiday		?
Other arrangements		? *Please specify*_____

3. a) Did you travel here today by:

Walking		?
Bicycle	?	
Private car		?
Public transport	?	
Other		? *Please specify* _____

b) If you came by private car, were you given a lift by someone else?
Yes ? No ?

c) If you came by private car, how much was paid in car park fees ? _____

d) If you came by public transport how much did it cost ? £_____p_____
(write down the single fare; if given a return fare, halve it)

4. How long did the whole journey take? _____minutes

5. Did anyone come with you to hospital,
and wait for you while you received your care ? Yes ? No ?

If yes, did they take time off work ? Yes ? No ?
If more than one person, please specify _____

6. Have you been advised to take time off work after today's visit ? Yes ? No ?
If yes, how long ? _____days

9. What money income, if any, are you losing today by coming to the clinic?

None ? £_____ p_____

10. If you have children or other dependants,
    Have you paid someone to look after them ? Yes ? No ? Not Applicable ?
    If yes, how much has it cost ? £_____ p_____
    or
    Has someone taken time off work to look after them ? Yes ? No ?