Resource Guide
Literature review: Economic costs of waiting for healthcare (Oct 06)

1. Taking a broad view of the total economic costs of waiting for healthcare gives 3 different types of cost:

(i) Patient costs: impact from reduced economic activity as a result of patients being unable to participate in the labour force including direct loss of production as well as broader reduction in economic activity;

(ii) Caregiver costs: impact from reduced economic activity as a result of caregivers giving up work to care for family members or relatives;

(iii) Health care system costs: include additional costs to health care system from patients having to attend medical appointments, submit to tests and procedures, and take medications that would not have been needed had waiting time not been ‘excess’

2. The total cost is roughly the product of the roughly the sum of these and the time spent waiting. But the costs are sensitive to whether the patient can continue their normal activities while they are waiting. For example, most waiting for cataract surgery can continue their regular activities so the waiting costs per patient are relatively low while the opposite is true for CABG.

Methods for assessing the economic costs of waiting

3. There are 3 methods in the literature for assessing the economic costs of waiting.

Direct patient, caregiver and health system costs (method I)

4. This approach looks at attaching costs to each of these elements and then multiplying by the time spent waiting to get an overall figure for economic costs. This approach was used in the most recent study, The Economic Costs of Wait Times in Canada, (Centre for Spatial Economics, 2006).

The Economic Cost of Wait Times in Canada

5. The wait times experienced by patients having to wait longer than medically reasonable for treatment, impose costs not only on the patients themselves but also on the economy as a whole. This study looks at ‘excess’ wait times i.e. ‘the cost of waiting longer than is medically recommended for treatment’\(^1\). These costs would be avoided if wait times were reduced or eliminated. (See detailed account in annex 1).

\(^1\) Canada’s maximum recommended treatment wait (compared with 18 weeks or 126 days in UK) are:
- total joint replacement surgery: 124 days
- cataract surgery: 112 days
- coronary artery bypass graft: 33 days
- MRI scans: 25 days
6. 4 priority areas were analysed: total joint replacement surgery, cataract surgery, coronary artery bypass graft, and MRI scans for 4 Canadian provinces. The study looks at wait times from when specialist requests a course of treatment to the time treatment occurs and compares the maximum medically reasonable wait time with the median wait time and the average excess wait time for those who have to wait longer than the maximum recommended period.

7. Patient costs: This study uses average wage to estimate cost of waiting since this represents the marginal cost of a person’s time i.e. amount person has to be paid to do an extra hour’s work or to forgo an hour of leisure. It takes account of the proportion of people reporting ‘significant difficulties in carrying out their daily activities’ and calculates a wait time cost (i.e. time waiting x average labour income x proportion reporting ‘significant difficulties’ adjusted for age, sex and participation in labour force).

8. Caregiver costs: The study looked at the proportion of patients that require a caregiver from physician responses and uses a methodology to calculate overall costs.

9. Health care system costs: Looking at the additional costs imposed on the health system (but ignoring direct private costs to patients) the study surveyed physicians’ views of the need for additional pre-op and post-op appointments, additional tests, additional medications etc.

10. Total GDP costs per patient: Adding up the patient, caregiver and health system costs gives the total GDP costs per patient of waiting. These are: $10,288 (£4899) for total joint replacement surgery; $1,480 (£705) for cataract surgery; $8,185 (£3898) for coronary artery bypass graft and $3,820 (£1819) for MRI scans. But these figures do not let us see how costs relate to length of wait. The corresponding figures on average (median) waits are and costs per month waiting are:

<table>
<thead>
<tr>
<th>procedure</th>
<th>Average (median) wait</th>
<th>Average (median) wait</th>
<th>Average cost per month waiting*</th>
</tr>
</thead>
<tbody>
<tr>
<td>total joint replacement</td>
<td>136.5  4.49</td>
<td>136.5  4.49</td>
<td>136.5  4.49</td>
</tr>
<tr>
<td>cataract surgery</td>
<td>92.2    3.03</td>
<td>92.2    3.03</td>
<td>92.2    3.03</td>
</tr>
<tr>
<td>coronary artery bypass graft</td>
<td>20.2    0.66</td>
<td>20.2    0.66</td>
<td>20.2    0.66</td>
</tr>
<tr>
<td>MRI scans</td>
<td>86.5    2.84</td>
<td>86.5    2.84</td>
<td>86.5    2.84</td>
</tr>
</tbody>
</table>

*author’s calculations

Other studies using direct patient, caregiver and health system costs approach
11. Esmail (2005) used a similar approach to assess the privately borne costs of queuing for health treatment in Canada i.e covering 1(i) or just the patient costs but excluding the caregiver and health system costs. Using a slightly different methodology, he assumed a 10% loss of productivity in place of the reduction due to ‘significant difficulties’ used in the ‘The Economic Cost of Wait Times in Canada’ study. He estimated $900 in 2004 if only hours during working week were ‘lost’ or $2,700 if all waking hours were lost. This is based on the assumption (from Statistics Canada) that only 9.8 per cent of patients waiting for care are experiencing significant difficulty which might be quite conservative and hence the estimate quite low.

12. Globerman (1991) earlier used a similar approach to Esmail, viewing wait times as potentially limiting productive activities (paid or unpaid) but only those reporting ‘significant difficulties in carrying out their daily activities’ (about 41% of those waiting) were counted as losing wages. This study was more sophisticated in than that of Esmail in that they allowed for differences in the proportion of people across specialties adversely affected by waiting. These varied from 14 per cent for those waiting for gynaecological procedures to 88 per cent of those waiting treatment by a cardiovascular surgeon. He estimated the private cost per patient about $2,900 in Canada (1989).

Patient valuations of cost of waiting (method II)

13. This method just looks at **patient costs** and **caregiver costs** in paragraph 1 above but by implication excludes **health system costs**.

14. Propper (1990 and 1995) took a revealed preference approach. She consulted a representative sample of the population in England (sample of 1360 aged between 25 and 70) and asked about their willingness to pay to reduce waiting. This involved a hypothetical choice between immediate treatment paying various out-of-pocket costs in an NHS hospital and treatment after a wait in the same NHS hospital at zero cost. The respondents were asked to assume that their condition would neither improve nor deteriorate during the wait. At the time of the study (1989) average waiting times were around 3-4 months (13-17 weeks) for most elective conditions in the UK. The study concluded that the average value, to the demander, of a reduction of a month in time on a waiting list for non-urgent treatment was about £40 (1987 prices). This equates to £65 in 2001 prices (OECD, 2003) or £72 in 2006 prices (author’s calculation, using GDP deflator index).

15. A study of cataract surgery in Canada, Denmark and Spain (Dunn et al, 1997) asked respondents about expected waiting times and dissatisfaction with waiting. Expected median waiting times were 5 months in Canada and Denmark and about 2 months in Spain and 43% of Canadian patients, 57% of Danish patients and 29% of Barcelona patients thought these waits were longer or much longer than they would like. About two thirds of the whole sample thought that 3 months was a reasonable wait for cataract surgery but there was limited support for paying higher taxes to eliminate waiting. (15% of Canadian patients, 24% of Danish patients and 12% of Barcelona patients).
Another study (Bishai and Lang (2000)) looked at willingness to pay by this group to reduce waiting to 1 month by paying for private care only a minority were willing to do so (15% of Canadian patients, 12% of Danish patients and 25% of Barcelona patients). This study estimated that the average cataract patient would be willing to pay between $24 and $107 (1992 prices) for a reduction in waiting time of 1 month. This equates to £19 and £83 in 2001 prices (OECD, 2003) or £21 to £92 in 2006 prices (author’s calculation, using GDP deflator index).

16. The UK’s National Audit Office (NAO, 2001) looked at inpatient and outpatient waiting in the NHS specifically and examined the real cost to the patient of waiting for treatment. They identified 3 main costs (following Propper, 1995): the cost of poor health, the cost associated with the anxiety of waiting for an operation and the stress and inconvenience of not knowing when they will be treated. The estimated cost of waiting (inflated to 1999 prices) was £75 per month per patient, equivalent to £88.50 at 2006 prices (author’s calculation, using GDP deflator index).

Using private sector as benchmark (method III)

17. The scope of this method is that same as method II i.e. it looks at patient costs and caregiver costs in paragraph 1 above but by implication excludes health system costs.

18. Cullis and Jones (AER, 1986) approach assumes paying for private care is the alternative to waiting for NHS treatment and assumed that the observed price for private treatment (p) sets an upper bound on the cost of waiting. If the costs of waiting for individuals in the queue were distributed uniformly between 0 and p then the average cost of waiting would be p/2. The estimated cost of waiting in UK on this method was about $5,600 (1981) or between £200 and £400 a month (in 2001 prices) (from OECD, 2003) or between £223 and £445 a month in 2006 prices (author’s calculation, using GDP deflator index).

19. Another study by Leung (2005) looked at the amount patients were in practice willing to pay to reduce their waiting time by 2 weeks in a mixed economy medical system of public and private medicine in Hong Kong. Initially patients are attracted by the quality but low out-of-pocket charges of the public clinics but then find that they cannot afford the time cost of waiting and so pay to go to the private sector. With a sample of 6495 aged 16 or over for specialist outpatient consultations the study found that the median willingness to pay to shorten the wait by 2 weeks was $100 (and that median expenditure was $300).

Does delay in treating patients increase health system costs? (method IV)

20. This method looks only at health system costs but not at patient costs and caregiver costs (see paragraph 1 above).
21. Quan et al (2002) looked at waiting times and total physician and prescription claim costs before and after surgery for patients awaiting knee replacements (mean wait 107 days), hip replacements (mean wait 94 days), cholecystectomies (mean wait 60 days), discectomies (mean wait 65 days), and hysterectomies (mean wait 55 days). The study was based on 3 urban hospitals in Alberta. No evidence was found to suggest that waiting for 1 of 5 common surgical procedures (knee replacements, hip replacements, cholecystectomies, discectomy, hysterectomies) was correlated with greater health service expenditures pre- or post-operatively in Canada. But this finding is likely to depend on the fact that they were not able to control for health status (OECD, 2003) and that patients who waiting longer had less need in the sense that they were less disabled and had less need to physician attention and drugs despite their longer waits.

Summary

22. The Canadian studies which are based on direct estimates of the amount of working time lost as a result of waiting for treatment are probably quite conservative: they omit any impact on leisure time or other activities outside paid work such as childcare. More importantly it is not clear how applicable they are to the UK context in terms of cost per patient since average wait times are much lower in Canada and there is no data available of the cost of waiting by week or by month. But they do show the relative costs of waiting for different procedures i.e. that waiting costs for total joint replacement surgery may be 5 times that for cataract surgery and that a CABG may be over 20 times that for cataract surgery

23. Looking solely at the private costs to patients, a Canadian study of what patients might pay to reduce waits for cataract surgery suggests a range of £21 to £92 in 2006 prices. Propper (1995) looked at what patients might be willing to pay in the NHS to reduce waiting times based on data collected in 1987. The estimated cost of waiting (inflated to 1999 prices) was £75 per month per patient, equivalent to £88.50 at 2006 prices (author’s calculation, using GDP deflator index). It is clear from this work that the Canadian valuations are much higher than the NHS valuations although the NHS valuations are very out of date.

24. And work done in the UK – again in the 1980s – by Cullis and Jones assuming that paying for private care is the alternative to waiting for NHS treatment gives an estimated cost of waiting in UK of about $5,600 (1981) or between £223 and £445 a month in 2006 prices (author’s calculation, using GDP deflator index).

Conclusion: Which approach to use for costs to patients of waiting?
25. To find a rule of thumb to use for costing patients’ waiting it is best to use Propper’s study because it is based on the UK although very out of date. Her figures are significantly lower than Cullis and Jones’ and much lower than the Canadian figures. And given that her data comes from 1987 we know that the public’s valuation of expenditure on health rises as general wealth rises so will be much higher in 2006 than in 1987 (aside from inflation). Thus a very conservative figure would be value patients’ waiting in the UK at £100 a month, though the real figure may be more like Cullis and Jones’ lower bound of £200 a month.
Annex A  The Economic Cost of Wait Times in Canada

4 priority areas were analysed: total joint replacement surgery, cataract surgery, coronary artery bypass graft, and MRI scans for 4 Canadian provinces.

<table>
<thead>
<tr>
<th>procedure</th>
<th>Average cost C$</th>
<th>Average cost £</th>
</tr>
</thead>
<tbody>
<tr>
<td>total joint replacement surgery</td>
<td>10,000</td>
<td>4769</td>
</tr>
<tr>
<td>cataract surgery</td>
<td>1,500</td>
<td>1192</td>
</tr>
<tr>
<td>coronary artery bypass graft</td>
<td>8,200</td>
<td>3911</td>
</tr>
<tr>
<td>MRI scans</td>
<td>3,800</td>
<td>1812</td>
</tr>
</tbody>
</table>

The study looks at wait times from when specialist requests a course of treatment to the time treatment occurs and doesn’t assess costs of reducing that waiting time (which would be needed for full cost benefit analysis of reducing waiting times.)
[For the UK the decision to reduce waiting times has already been made so similarly only the costs of waiting are of interest.]

The study compared the maximum medically reasonable wait time with the median wait time and the average excess wait time for those who have to wait longer than the maximum recommended period.

**Patient costs**

This study uses average wage to estimate cost of waiting since this represents the marginal cost of a person’s time ie amount person has to be paid to do an extra hour’s work or to forgo an hour of leisure.

Proportion reporting ‘significant difficulties in carrying out their daily activities’ were:
- 33.1% for those waiting to see specialist
- 34.5% for those waiting for diagnostic testing
- 34.7% for those waiting for non-emergency surgery

Estimated proportion of patients that need to discontinue regular activities (from Western Canada waiting list project):
- total joint replacement surgery 32%
- cataract surgery 7%
- coronary artery bypass graft 95%
- MRI scans 22%

Wait time cost = time waiting x average labour income x proportion reporting ‘significant difficulties’ adjusted for age, sex and participation in labour force.
Caregiver costs

Proportion of patients that require a caregiver (from physician responses):

- Total joint replacement surgery: 20%
- Cataract surgery: 5%
- Coronary artery bypass graft: 25%
- MRI scans: NA

Then use similar methodology to above.

Health care system costs

Looking at the additional costs imposed on the health system (but ignoring direct private costs to patients) the study surveyed physicians’ views of the need for additional pre-op and post-op appointments, additional tests, additional medications etc. This gives detailed breakdown but can be summarised as:

<table>
<thead>
<tr>
<th>Additional costs arising from excess waits</th>
<th>App’t</th>
<th>Test</th>
<th>Drug</th>
<th>Drugs age &gt;65</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cost</td>
<td>cost</td>
<td>cost</td>
<td>cost</td>
<td>cost</td>
</tr>
<tr>
<td>Total joint replacement surgery</td>
<td>$217</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cataract surgery</td>
<td>$35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coronary artery bypass graft</td>
<td>$317</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI scans</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of course waiting times are longer in the UK but probably incidence of additional test etc is less.

Total GDP costs per patient

Adding up the patient, caregiver and health system costs gives the total GDP costs per patient:

- Total joint replacement surgery: $10,288
- Cataract surgery: $1,480
- Coronary artery bypass graft: $8,185
- MRI scans: $3,820
References


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