

*Supplementary appendix 2. Economic data tables.**Supplementary appendix 2: table 1. Studies including economics data — methods.*

| Author and publication date | Viewpoint of study | Resource use data | | | Currency, and year in which costs reported |
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| | | Method of collection | Method of valuation | Costs included/reported | |
| Organisational (provider and structural) interventions | | | | | |
| Harvey 1998 | NHS and private health care | Prospective (forms in GP notes) | Direct estimation of unit costs — GP time Actual expenses — counsellor time Mean hospitals' costs — referral costs Published literature — counsellor time (sensitivity analysis) | Prescribed medication, practice staff and counsellor time, referrals to other agencies. [Various assumptions made regarding pattern of referral follow-up] | Sterling, year unclear (stated as 1992–1994) |
| Hackett 1993 | Practice and patients | Prospective by GPs, retrospective Q to patients | Unclear — prescription costs. Not done — physiotherapy appointments, GP appointments, X-rays. Actual expenses — patients | Prescriptions, appointments, X-rays, patient travel, patient lost work, patient other | Sterling, year unclear (1998/1999 study date; 1992 acceptance date) |
| Ratcliffe 1996 | NHS, women and families | Prospective by midwives, retrospective Q to women | A single teaching hospital's costs — tests/investigations. Direct estimation of unit costs — staff time and GPs Actual expenses — patient costs. DoT estimates of time/work lost | Investigations, staff, non-routine care, non-health service costs | Sterling, year unclear (1993/1994 study; 1996 published) |

Supplementary information

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| Gillam 1995 | NHS (patients' costs collected but not reported) | Prospective activity data, retrospective Qs to patients | Not clear | Staff costs; travel by outreach team; medication/disposables; overheads; equipment depreciation. (Patient Q collected information on transport, distance, journey time, waiting time — not reported) | Sterling, year unclear, (1992/1993 study date; 1995 acceptance date) |
| Organisational (structural) interventions | | | | | |
| Rink 1993 | NHS and patients, not stated | Retrospective note review | Not clear — near patient and laboratory test costs estimated and compared with the average for 100 British laboratories, weighted by throughput. | Test costs, including capital, maintenance, quality assurance, staff, consumables and phlebotomy costs. Patients' time, transport and employment costs. | Sterling, 1991 |
| Howie 1994 | Hospital only | Retrospective note review | Health board's charges — outpatient episodes (orthopaedics, physiotherapy, spine radiography) | Referrals (including direct access physiotherapy); investigations; prescriptions | Sterling, 1992 |
| Blair 1996 | Practice (not stated) | Retrospective note review | Fundholder prices — outpatient and outreach clinic visits | Cost per outpatient or outreach visit | Sterling, year not clear (current fundholder prices 1995 at time of study, or 1996 at time of submission) |
| Professional interventions | | | | | |

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| Morrison 1999 | NHS | Retrospective note review | Unit costs from one study hospital | Pre-referral tests and investigations. Post-referral tests, investigations and clinic attendances | Sterling, 1997/1998 |
| Thomas, ca.1998 | NHS and patients | Retrospective hospital note review, retrospective postal Qs to GPs and patients | AA estimates — travel costs Actual expenses — consumables, GP ‘incentive’ payments Single hospital costs — investigations, treatment Published literature — other staff/drugs. | Development of guidelines; visits to hospital/GP; investigations; treatment | Sterling, year unclear (AA costs 1998; published costs 1996; hospital costs unclear) |
| Financial & regulatory intervention | | | | | |
| Schoffski 1997 | Health care system and patients (not stated) | Retrospective interrogation of database | Not clear — average costs per visit to specialist and per hospitalisation | Monthly referral rates and hospitalisation rates | Deutsche Marks, year unclear (1992 or 1993) |

Q = questionnaire.

Supplementary appendix 2: table 2. Studies including economics data — results.

| Author and publication date | Cost of intervention | Results | Critique | Change in referral and total costs and/or resource use (NHS perspective) |
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| Organisational (provider & structural) interventions | | | | |
| Harvey 1998 | Mean cost: £40.37 per patient in counsellor arm (Intervention = brief course of counseling) | <p><i>Mean number referrals</i></p> <p>Counsellor arm (0.07)</p> <p>Usual care arm (0.22)</p> <p><i>Referrals (mean cost per patient)</i></p> <p>£9.89 counsellor arm</p> <p>£38.95 usual care arm</p> <p><i>Additional (non-referral) costs (mean cost per patient)</i></p> <p>£67.09 counsellor arm</p> <p>£57.87 usual care arm</p> <p><i>Total costs (mean cost per patient)</i></p> <p>£71.21–£81.23 counsellor arm</p> <p>£89.67–£109.51 usual care arm</p> | <p>Patient costs not included. Additional (non-referral) costs include cost of counsellor time in each arm. A sensitivity analysis shows the results are sensitive to the hourly cost of counsellor time.</p> | <p>↓ Referral costs per patient</p> <p>↓ Total costs per patient</p> |

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| Hackett 1993 | Not clear (Intervention = on-site or direct access to physio) | <p><i>Prescribing (mean cost per patient)</i> practice A: £3.65, practice B: £3.85, practice C: 5.85</p> <p><i>Patient expenses (mean cost)</i> A: £0.27, B: £7.42, C: £16.12</p> <p><i>GP consultations (mean number.)</i> A: 2, B: 2, C: 2.1</p> <p><i>Physiotherapy appointments (mean no.)</i> A: 7, B: 7.2, C: not clear</p> <p><i>X-rays (no. patients referred)</i> A: 11, B: 4, C: 15</p> <p><i>Patient lost days (median)</i> A: 4, B: 3, C: 14</p> <p>Total costs (prescribing plus GP and hospital consultations) unclear.</p> | Fairly comprehensive resource use measurement but not all resources are valued. Hospital costs of referrals not measured or valued. The mean number of visits to the physiotherapist is not clear for practice C — reported as the mean number of visits for those patients having a visit (mean = 7.2 for NHS and 7 for private patients). Should be reported per referred patient. | <p>? Referral costs (↔ number of visits to physiotherapist)</p> <p>? Total costs</p> |
| Ratcliffe 1996 | Not reported separately Intervention = introduction of GP- and/or midwife-led care. These costs included in total costs | <p><i>Self referrals (mean cost per woman)</i> Shared care: £4.31, GP/midwife care: £4.29</p> <p><i>Referrals between professionals (mean cost per woman)</i> Shared care: £6.35, GP/midwife care: £8.64</p> <p>⇒ Total referral costs per woman of £10.66 in shared care arm and £12.93 in GP/midwife arm.</p> <p>Total NHS costs per woman of £316.67 in shared care versus £298.75 for GP/midwife care.</p> | Comprehensive RCT covering both NHS and women's costs. Sensitivity analysis tested opportunity cost of staff time. Teaching hospital costs used, which will be greater than non-teaching costs. | <p>↑ Referral costs per woman</p> <p>↓ Total costs per woman</p> |

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| Gillam 1995 | £394.34 per session (Intervention = outreach clinic) | <i>Outreach clinic:</i> £394.34 per session; £48.09 per patient seen <i>Outpatient clinic:</i> £397.57 per session; £15.71 per patient seen Total number of referrals (outpatient and outreach clinics together) increased in the intervention practices. Combined with the greater costs of outreach care, the cost per referral in the intervention practices will be higher. | Study includes only cost per patient of initial attendance at outreach or outpatient clinic. There is no comparison of the cost per patient referred in the intervention compared to control practices. Patient costs not reported. | ↑ Referral costs per case Total costs not given |
| Organisational (structural) interventions Rink 1993 | Not clear (Intervention = near patient testing) | Fewer <i>investigations and referrals</i> for midstream urine analysis: estimated annual savings of £1150–£2450 per practice | Costs/savings from referrals not reported explicitly. Methods of analysis of resource use/costs data unclear. No mention of practice size for estimated annual savings. | ? <u>Referral costs</u> ↓ <u>Total costs</u> per practice |
| Howie 1994 | Not known (intervention = becoming fundholding practice) | Hospital services (<i>referrals and investigations</i>) saving: £27 per patient presenting with pain. (<i>Referrals only:</i> £26.20) For 10 000 patient practice, possible hospital savings of £22 700 between 1990 and 1992 (<i>Referrals only:</i> £22 034) | Only hospital costs reported. General practice costs not investigated. The study assumes referrals are divided equally between orthopaedics and physiotherapy. This could affect results substantially, as orthopaedic referrals cost twice as much as physiotherapy referrals. | ↓ Referral costs per case Total costs not given |

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| Professional intervention | Blair 1996 | Not clear (Intervention = access to outreach/communit y paediatrics) | More <i>investigations</i> in hospital compared to community setting (OR 6.39, 95% CI 3.25–12.55, $P = 0.0001$) More <i>discharges</i> at 1st visit in hospital setting (OR 2.92, 95% CI = 1.64 to 5.20, $P = 0.0004$) | Study gives prices charged to fundholders of new and follow-up outpatient visits, and visits to outreach/community based clinics. These values are not applied to study findings. |
| | | | | (↓ Referral price per new case) Total costs not given |
| | Morrison 1999 | Not reported (Intervention = development and dissemination of guidelines) | <i>Cost per successful outcome:</i> Intervention group £530, control group £495 <i>Total cost</i> of intervention per 100 referrals is £2230 greater for same number of successful outcomes, ⇒ not cost effective. | Cost of guideline development and implementation not included — this included an interactive meeting and the option of an individual practice visit. |
| Financial and regulatory intervention | Thomas ca.1998 | £10 670 (or 187.2 hours) (Intervention = development and dissemination of guidelines) | Reported as incremental costs and benefits — <i>Hospital management costs (saving over 10 months):</i> £2232.78 <i>GP management costs (saving over 10 months):</i> £214.63 <i>Patient expenses (savings over 10 months):</i> £303.28 (each reported against benefits in natural units e.g. improved GP knowledge) | Median, not mean, costs per patient and at practice level are reported. Guideline costs are likely to be an overestimate (work & leisure time valued equally). |
| | | | | ? Referral costs ↑ Total costs |

Supplementary information

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| Schoffski 1997 | <p><u>Saving</u> of DM 5.4 billion (Intervention = imposition of drugs budget for office based physicians)</p> | <p><i>Referral and hospitalisation rates:</i> increased significantly after imposition of drugs budget. <i>Sickness funds:</i> referral and hospitalisation increased in 5 disease groups <i>Private health insurance:</i> Referrals and hospital admissions fell in all groups except hypertension <i>Physician's fees and hospital costs per case (direct costs):</i> DM 153.48 in 1992, DM 161.36 in 1993</p> <p><i>Total direct cost:</i> DM 1.4 billion per year <i>Additional indirect cost:</i> DM 1.8 billion per year</p> <p>⇒ <u>saving</u> of DM 4 billion per year</p> | <p>Decision analysis used to apply average costs to referral and hospitalisation rates. The study gives an indication of the impact on national expenditure. Direct costs are physicians' fees and hospital costs. Indirect costs are the value (average wage rate) of patients time losses for additional treatment.</p> | <p>↑ Referral and admission costs per case ↓ Total costs</p> |
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Supplementary appendix 2: table 3. Four additional studies added after updating the review in 2001.

| Author, journal, year | View-point of study | Resource use data | | | Currency and year costs were reported | Cost of intervention | Results | Limitations | Change in costs or resource use |
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| | | Method of collection | Method of valuation | Categories reported | | | | | |
| Delaney, <i>Lancet</i> 2000 | Health service (primary and secondary care) | Retrospective primary care case note review (for both primary and secondary care resource use) | Unit costs taken from 'national reference sources' (further details on journal's web site — link not available at time of writing) | Endoscopy, barium meal, outpatient appointments, inpatient episodes, <i>H.pylori</i> test, GP consultations, <i>H.pylori</i> eradication | Sterling, 1998 | £246 per endoscopy (Intervention = initial endoscopy) | <i>Initial endoscopy</i> (study) group (mean cost per patient over 12 months): £420, <i>Usual management</i> (control) group: £340 <i>Incremental cost effectiveness ratio</i> per patient symptom free at 1 year: £1728 Sensitivity analysis and cost effectiveness acceptability curve: <i>cost of endoscopy</i> has greatest effect | Patient costs not included | ↑ |
| Jones, <i>IJCP</i> 1999 | General practice | Audit of practice notes and prescribing register (assume retrospective) | BNF Local NHS Trust data DoH publications Actual price (of test and treat kit) Costs given in a published paper. | Primary care consultations, upper gastrointestinal endoscopy, rapid blood test kit, outpatient visits, urea breath tests Prescriptions | Sterling, year unclear (states sources from 1996–1999) | £16 per rapid blood test kit (Intervention = <i>H.pylori</i> serological testing kit plus visit from study GP and researcher) | (Mean?) Total costs of consultations, <i>referrals</i> , investigations and treatment for 1 year — test and treat (study) group: £205.67, usual management/initial endoscopy (control) group: £404.31 <i>Hospital referrals (total)</i> — study group 43 (30%) v. control group 16 (17%) (χ^2 5.056, $P <$ 0.025) <i>Hospital referrals excluding urea breath tests (total)</i> — study group 32 (22%) versus control group 15 (16%) <i>Endoscopy (total)</i> — study 17 (12%) v. control 97 (105%) <i>GP visits (mean)</i> — study 6 (4%) v. control 6 (6.5%) <i>Prescription costs (mean)</i> — study £55.73 v. control £53.59 (excluding <i>H.pylori</i> eradication £40.28 v. £45.21) <i>Barium meal</i> — study 4 (3%) v. | Initial blood test and study team visit not included. Some London hospital costs used – not generalisable Resource use reported as 'total' costs: unclear if they are 'total costs' for the whole group or 'mean total costs' per patient. | Total costs ↓ Hospital referrals (nos.) ↑ |

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| | | | | | | | control 4 (4%) <i>Ultrasound scan</i> — study 3 (2%) v. control 0. | | |
| Delaney, <i>BMJ</i> 2001 | Health service (primary and secondary care) | Retrospective primary care case note review (for both primary and secondary care resource use) | Not given in paper. (<i>BMJ</i> 's website gives additional table showing unit costs used. Values taken from Public Health Laboratory Service, BNF, NHSE publication, other published source, actual costs) | Endoscopy, barium meal, outpatient appointments, inpatient episodes, <i>H.pylori</i> test, GP consultations, <i>H.pylori</i> eradication | Sterling, year not given (unit costs references from 1997 and 1998) | Not given (Intervention = test and endoscopy) | <i>Test & endoscopy</i> (study) group (mean total costs over 1 year) £367.85 v. <i>usual management</i> (control) group £253.16 <i>Outpatient appointments</i> (mean no. per patient) — study 0.23 v. control 0.21 (diff 0.01, 95% CI = -0.13 to 0.15) Difference (95% CI) for mean resource use per patient for all categories reported: no significant differences except for interventions (<i>H.pylori</i> tests and endoscopies) | Limited data and results given in paper. | Mean total costs ↑ Outpatient appts (nos) ↔ |
| Donohoe, <i>Diabetic Medicine</i> 2000 | Not stated (cost of educational intervention given, not costs of resource use during RCT) | Not stated | Published and 'accepted' rates for staff (inc. employer overheads and contributions), travel and other resources | Staff costs (consultant, senior registrar, primary care and community staff), travel, resources (preparation and circulation of leaflets and slides, monofilaments) | Sterling, year not stated | £4216 total cost of providing the educational programme to intervention practices. Intervention = educational programme | No comparison of costs or resources use in intervention v. control group given. | Study considers only the costs of the intervention, not the subsequent costs associated with implementation of the intervention | Not clear |