Primary Health Care Research and Development 2005; **6**: 232–243

Costs and consequences of Personal Medical Services (PMS): a case study approach to the national evaluation of PMS in the UK

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Personal Medical Services (PMS) contracts, introduced in 1997, provide a new financial model for providing general practice. The aim of this study was to measure the *costs and consequences* of the PMS first wave contracts for sites that aimed to increase the accessibility and the quality of care for vulnerable population groups; to describe the problems encountered in this measurement. A purposive sample of first wave PMS sites targeting vulnerable population groups were selected. A two-stage data collection procedure was used, to obtain *micro-level* data on the quantity and costs of capital and recurrent funds, and *top-down* data on costs and apportioning of monies received from central source to broad expenditure categories. The costs data focused on the largest cost components, such as staff and prescribing as well as alternative stakeholders' contributions. The consequences data measured the accessibility and the quality of care for vulnerable population groups. Five case studies were considered. Sites that were formerly independent general medical practitioner (GP) contractors consolidated their staff with few changes in their staff-skill mix. In all sites the prescribing costs per patient were below the national average in 2000/01. Access was either consolidated or improved over the period and improved quality of care was in evidence through appropriate prescribing patterns. Though the evaluation found that the PMS sites were addressing their main objectives the data collection revealed difficulties in tracking the flows of PMS resources under the current budgetary system. We highlight the limitations of the PMS data monitoring procedures and discuss how these limitations can be overcome so that future National Health Services (NHS) reforms can be appropriately evaluated in the future.

Key words: contracts of employment; personal medical services; salaried doctors

Introduction

Following the 1997 NHS (Primary Care) Act (UK DH, 1997), there was a radical change in the structure of primary care, with promotion of local provider contracts enabling general medical practitioners (GPs) and other organizations to provide Personal Medical Services (PMS) (NHS Executive, 2000). In this article the inequalities team of the Department of Health's national evaluation of PMS (The Personal Medical Services (PMS) National Evaluation Team, 2002), reflects on the experiences of the economic evaluation of first wave pilot sites. Other parts of the national evaluation considered different aspects of the PMS scheme, such as salaried GPs' satisfaction and stress

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10.1191/1463423605pc246oa

(Gosden *et al.*, 2002), quality of care (Campbell *et al.*, 2000) and accountability and co-operation (Meads and Riley, 2001; The Personal Medical Services (PMS) National Evaluation Team, 2002; Meads *et al.*, 2003; Meads *et al.*, 2004).

The PMS scheme was part of the government's initiative to decentralize decision making to local providers with the aim of using resources more effectively (NHS Executive, 2000). To facilitate this, traditional general practices and new greenfield sites were invited to apply for a PMS contract to provide the same services as those provided in the General Medical Services (GMS). Additionally, they were able to employ salaried GPs and had the option of a PMS+ contract to provide services beyond the GMS. The main implications of these changes are summarized in Box 1.

In this article, we report five case studies that targeted vulnerable population groups, such as homeless people, minority ethnic groups and severely mentally ill people. One of the main aims of these PMS sites was to increase the accessibility and the quality of care for these vulnerable population groups. In the sections Methods and Results, we review our data collection strategy and report on our evaluation. In the Discussion we overview the problems experienced in collecting the data and the extent to which the new 2002 GP contract overcomes these problems (Pownall, 2002).

Methods

We sought to assess the impact of the PMS scheme, in terms of the *costs and consequences* of implementing the scheme, compared with historical data (Mauskopf *et al.*, 1998). A cost and consequences approach is the first stage of a more detailed economic evaluation, and is typically undertaken if data limitations or lack of comparative control sites prevent a more in-depth analysis. This approach is therefore a minimum requirement for any economic evaluation of government interventions. Difficulties experienced in obtained this basic information should be of concern to all policy makers. Of the 87 PMS sites that went live between April and October 1998 (Leese *et al.*, 1999), 41 of these sites targeting vulnerable populations were selected for the inequalities study. From those 41 sites a maximum variety sample of 13 sites were selected for in depth case studies (Riley *et al.*, 2003).

We collected data on the costs and consequences of the PMS scheme using a two-stage data collection procedure. First, a research officer (AJR) collected *micro-level* data on the quantity and costs of capital and recurrent expenditure between 20 and 24 months of the PMS inception (Dranove, 1996; Luce *et al.*, 1996; Deehan *et al.*, 1997).

Secondly, a health economist (AS) collected data from nine of the original 13 sites providing the most complete annual data. This stage involved a *top-down* approach to costing where monies received from central sources, such as health authorities (HAs) and primary care groups or trusts (PCGs or PCTs), were apportioned to expenditure categories given in Box 2. The data requests were tailored to each site based on discussions with key informants (Campbell *et al.*, 2000). These information *gatekeepers* were vital, given the loss of traditional primary care financial management skills in some of the new HAs/PCTs as a result of widespread National Health Services (NHS) organizational change.

The cost data aimed to capture the main expenditures of the PMS sites, such as prescribing costs

Box 1 Implications of the PMS contract

The main implications of these new contractual arrangements were to:

- offer greater flexibility to allocate budgets
- provide broader definitions of performance
- substitute primary for secondary services.

Box 2 Expenditure categories

- Total or budget spend, excluding prescribing costs
- Total PMS spend
- Practice staff costs
- GP pay (excluding locum and out-of-hours service)
- Staff training
- Information technology (IT) support and IT hardware
- Prescribing costs.

https://doi.org/10.1191/1463423605pc246oa Published online by Cambridge University Press

Table 1 Average Daily Quality (ADQ) categories[a]

British National Formulary Group	ADQ per patient
Insomnia: Hypnotics	Decrease
Anxiety states: Anxiolytics	Decrease
Antidepressant: Tricyclic	Decrease
Antidepressant: Selective SSRIs	Increase
Drugs used for nausea and vertigo: Prochlorperazine	Increase
Analgesics for visceral pain: Opioid analgesics	Constant or increase
Antiepiletics: Phenobarbitone	Constant or increase

[a] As new patients do not join a list at the same time, the prescribing data reflects a mixture of inherited drug use, improved prescribing behaviour and identification of unmet need. In addition, the number of mental health patients may not increase but a site's ability to keep them in the community may be enhanced with community psychiatric nurse prescribing.

Box 3 Mental health index and housing stress index

Mental health indicators were selected to assess mental health care needs in the local population based on the proportion single person households, private rented accommodation, ethnicity, long-term illness and material deprivation.

Housing stress indicators were selected to assess the proportion of households lacking amenities, the proportion of those people in rented local authority and private sector accommodation, overcrowding, residential mobility in a year, unemployment and material deprivation.

Each individual indicator, such as long-term illness, was converted to a *z*-score to give a standardized measure. A mental health index and housing stress index were then calculated by averaging these *z*-scores.[a]

[a] Geographic co-ordinates to locate places of residence were obtained from postcode 'Cameo classifications' gazetteer developed by EuroDirect Ltd © (2001).

and staff costs. We checked for efficiency by comparing prescribing costs to the national average. Staff whole-time-equivalent data were also considered to assess any skill mix changes made to meet the needs of vulnerable groups. Data were collected on alternative stakeholders' contributions, such as drugs teams, hostels, churches and charities, to provide a more accurate account of the opportunity of costs of the PMS sites. We also monitored how these extra contributions were spent to determine the extent to which NHS services were adapted in these sites.

The consequences data aimed to capture the main objectives of the PMS sites, such as improved accessibility and quality of care for vulnerable population groups. Ideally this data collection should involve an assessment of health outcomes. Given the resources and time limits of our evaluation, it was not possible to define and collect new data on health effects. Accessibility was measured by the patient-to-GP ratios and patient-to-nurse ratios, prescribing activity and, where appropriate, cervical screening and vaccinations. We also considered geographical coverage for those sites able to provide postcode information on their patients. These data were compared against a mental health or housing stress index calculated from the 1991 census data and described in Box 3 (the latest census data available at the time of the study). These indices were based on census data grouped by enumeration districts (EDs), the smallest units for which population data were available from the 1991 population census, with an average size of 200 households. The comparison of patient and census data helped to determine whether these patients were drawn from areas of high need (Curtis, 2001).

Quality of care was measured by the extent to which prescribing complied with medical guidelines. We used a standardized measure, the average daily quantity (ADQ) to quantify changes in drug usage (Maxwell *et al.*, 1993; Lloyd *et al.*, 1995). These data were obtained from e-PACT (electronic Prescribing Analysis and CosT), PPA (Prescription Pricing Authority) information service. Table 1 illustrates the drugs for which ADQ data were available in the UK and where prescribing was anticipated to change according to guidelines. For instance, guidelines for mental health problems

Table 2 Overview of the sites

Site	Target groups	Funding prior to PMS	Monitored by
K	Homeless	Charity and excess HA monies	HA and later PCT
C	Homeless	Charity	Community Mental Health Trust
L	Refugees, travellers and intravenous drug users	Independent GP contractor funded by a GMS contract	Community Health Trust
E	Mental health	Independent GP contractor: GPFH	HA and later PCT
J	Minority ethnic groups	Independent GP contractor: GPFH	HA and later PCT

GPFH: GP Fundholder.

recommend a decrease in tricyclic antidepressants, as these are addictive (rather than for their potential overdose risk), and an increase in selective serotonin re-uptake inhibitor (SSRI) (Martin *et al.*, 1997).

Results

All 13 sites responded to the first stage of data collection, but with mixed data completeness, and this raised doubts about the feasibility of collecting micro-level data.

In the second stage, five sites provided the most complete data; these are summarized in Table 2. These are best-case scenarios that illustrate the application of a costs and consequences approach to routinely collected data; the remaining sites were unable to provide adequate data for this analysis. On the costs side we focus on non-PMS funding, prescribing costs and staffing. On the consequences side we concentrate on the accessibility of services, prescribing and other target outcomes.

Other funding sources

Site K received 8–12% of funds from other sources. These additional funds paid for: computing hardware; a substance misuse support worker; counsellors and prior to 2000/01 a community drugs worker.

Site C received funds for staff from the Local Council (through the Mental Health Challenge Fund) and the Community Mental Health NHS Trust.

At sites L, E and J, the PMS scheme financed all expenditure. In site J, complementary services were financed through the GP Fundholder (GPFH) scheme, and on becoming PMS, the PCT continued to finance these.

Overall, two of the five sites promoted alternative stakeholder contributions, such as drugs teams, non-statutory organizations and charities (Meads *et al.*, 2003).

Prescribing costs

At a national level, the average costs of prescribing per patient were £85.28 in 1997/98 and £106 in 2000/01 (e-PACT, PPA information service)[1]. Two of the five sites (sites K and L) had higher prescribing costs than the national average in 1997/98, but all sites had lower than average costs in 2000/01.

Staff

At site K, the PMS scheme enabled the expansion of nursing and counselling staff in 1998/99 and an expansion of GP, management and administrative provision. The site did not receive any community psychiatric nurse support but a district nurse was provided for two hours per week. The staff training costs decreased in 2000/01 reflecting a change in financial arrangements as most training was then obtained through '*quid pro quo*' training exchanges (Table 3).

Site C expanded GP provision and recruited a female part-time GP to help address the needs of female patients, and increased management provision. The site also expanded its nursing team to include from 2000/01 a community mental health worker.

Site L increased its administrative staff, and slightly increased nursing and GP provision. The site also reported that financial security offered by the PMS contract helped to retain GP staff. Sites E and J reported that staff remained constant over the period.

[1]For more information on the NHS Prescription Pricing Authority (PPA) and ePACT please see www.ppa.org.uk

https://doi.org/10.1191/1463423605pc246oa Published online by Cambridge University Press

Table 3 Finances[a,b]

Year	Total[c] spend	PMS[c] spend	Pay		Non-pay	IT hardware	Training	Prescribing
			Staff	GP pay	IT support			
Site K								
1996/97	122 677		54 507				1153	96 574
1997/98	113 600		53 318				1967	85 872
1998/99	246 714	226 856	116 862	35 557	2731	0	1383	90 990
1999/00	336 493	315 104	152 511	43 084	3572	1358	1585	101 945
2000/01	383 026	336 634	193 210	57 324	3265	0	776	85 992
Site C								
1996/97								98 306
1997/98	145 755	121 560	55 650	48 035			198	70 753
1998/99	178 944	126 735	56 226	48 990	1233	382	990	72 882
1999/00	194 519	146 651	113 604	65 574	3424	6432	729	80 684
2000/01	246 232	153 013	165 876	76 006	350	1662	597	95 686
Site L[d]								
1996/97	323 692	323 692	82 819		5197			403 602
1997/98	347 240	347 240	100 793		971		1270	476 167
1998/99	417 068	417 068	150 822	141 548	7653		1086	475 985
1999/00	430 476	430 476	142 394	170 108	3896		4075	526 948
2000/01	446 833	446 833	169 878	197 000	8021		1875	459 944
Site E[e]								
1996/97	628 397[f]							712 073
1997/98	838 650		206 694				7767	749 234
1998/99	888 491		323 484	645 002	12 735	2553		793 692
1999/00	1 085 461		203 900		5069	13 616	3838	881 530
2000/01	1 016 758		202 906		5059	13 588	3831	917 434
Site J								
1996/97	272 997[f]				2618			214 506
1997/98	489 809				3184			242 362
1998/99	605 147	605 147	114 997		2074			266 646
1999/00	574 069	574 069	120 292	147 592	1992	13 582		297 816
2000/01	573 083	573 083	121 650		1940			304 320

[a] The figures have been adjusted for inflation using the Family Health Services index, with 1996/97 = 100.
[b] The table shows total spend and how this breaks down into key expenditure categories. The columns do not sum to the total spend since some expenditures were miscellaneous.
[c] Following usual NHS accounting practice, the total and PMS spend excludes prescribing costs.
[d] Site E is managed two GP practices, but separate financial records were not available for these practices.
[e] For site L, information technology (IT) support includes also IT hardware.
[f] This years figure excludes practice staff costs.

Overall there was tendency for formerly independent GP contractor sites (L, E and J) to consolidate staffing with few changes in their staff-skill mix.

Accessibility

At site K, the number of patients grew from a capped figure of 600 in 1997/98 to 1559 in 2000/01 (Table 4). The patient-to-GP ratio and patient-to-nurse ratio also increased, but remained within the national average (UK Department of Health, 2001). At site K, postcode data were available. These data showed that the average housing stress index for the EDs where at least one patient was drawn was 12.62, compared to 7.13 for EDs where no patient was drawn (Carter *et al.*, 2001).

Patient numbers at site C increased, reflecting attempts to draw new patients into primary care services. However, this increase was an underestimate, since patients were not encouraged to register with the practice unless medical records were required. For example, 1600 patients contacted the service between April 1998 and April 2001, and GP–patient consultations increased

Table 4 Staff

Year	Patients[a]	GP	Nurse	Admin[b]	Counsellor[c]	Manager	Co-ordinators[d]	Patients per GP	Patients per nurse
Site K									
1996/97		1.00	1.50	1.00	1.00	0.00	1.00		
1997/98	600	1.00	1.50	1.00	1.00	0.00	1.00	600	400
1998/99	1141	1.11	3.51	1.55	2.00	0.00	1.00	1028	325
1999/00	1422	1.14	3.51	1.97	2.00	0.58	1.00	1247	405
2000/01	1559	1.14	3.56	2.50	2.00	1.00	0.80	1368	438
Site C[e]									
1996/97	6		2.75	1.00		0.00			
1997/98	11	1.00	1.75	1.00	1.48	0.00			
1998/99	86	1.00	1.75	1.00	1.48	0.00			
1999/00	170	1.54	3.00	1.00	1.99	0.00			
1900/01	164	1.54	5.00	1.00	1.74	0.66			
Site L									
1996/97	4887	3	1.35	4.56	0.24	0.00	0.78	1629	3620
1997/98	4960	3	1.35	4.56	0.24	0.00	0.78	1653	3674
1998/99	4957	3.25	2.0	6.11	0.24	0.40	0.78	1525	2478
1999/00	4998	3.5	2.0	6.11	0.24	0.40	0.78	1538	2499
2000/01	4889	3.5	2.0	6.11	0.24	0.40	Vacant 0.78	1504	2444
Site E[f]									
1996/97	16 904	9.5	2.90	12.6				1779	5829
1997/98	17 099	9.5	2.90	12.6				1800	5896
1998/99	17 170	9.5	2.90	12.6				1807	5921
1999/00	17 061	9.5	2.88	12.6				1796	5924
2000/01	17 211	9.5	2.78	11.8				1812	6191
Site J[g]									
1996/97	5882								
1997/98	6318								
1998/99	6390								
1999/00	6394	3.5	1.6	6.4	1	1	0.625	1826	3996
2000/01	6794								

[a] Patients include people who were registered with the site as well as those undergoing treatment.
[b] Admin includes reception and administrative staff.
[c] Counsellors includes drug worker and substance misuse worker.
[d] Co-ordinators includes patient care co-ordinators.
[e] At site C, the patient-to-GP ratio and patient-to-nurse ratio were not calculated since these figures inaccurately represent access.
[f] The number of patients at site E's two practices have been combined in this table.
[g] At site J, information on the whole-time equivalents of staff were available for 1999/00 but not for other years.

from 3200 prior to PMS to 5000 in 2000/01. (*Source*: Practice records.)

At site L, patient numbers were restricted to 5000 to ensure that the site did not disadvantage neighbouring practices and there was a decrease in the patient-to-GP ratio and patient-to-nurse ratio.

At sites J and E, patient numbers remained constant. The patient-to-GP ratio and patient-to-nurse ratio also remained constant at a level close to the national average (UK Department of Health, 2001). To ensure services were more accessible for minority ethnic groups, site J established a community development worker post. At site E, which focused on mental health problems, the mental health index for the district was similar to that estimated for the PMS's catchment (6.09 compared to 6.05) (Table 5).

In summary, access was either consolidated or improved over the period. Where postcode data were available in site K, the data supported the idea that the site was drawing patients from areas with high housing stress. In site E, postcode data suggested that the site was not focused on an area

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Table 5 Site E, mental health need indicators and index[a]

	Private tenure	Males long-term illness[c]	Non-white	Singleton	Mental health index[d]
Site E, 3 mile catchment area[b]					
Mean	11.25	10.59	1.78	0.74	6.09
Standard deviation	8.56	7.81	3.49	1.01	3.24
Variance	73.33	60.95	12.15	1.02	10.47
Site E, data for all EDs in the district[e]					
Mean	10.44	10.85	1.81	1.11	6.05
Standard deviation	8.21	7.65	3.14	1.33	3.04
Variance	67.34	58.49	9.87	1.77	9.22

[a] The indicators (private tenure, males long-term illness, non-white and singleton) are presented as *z*-scores which reflect how far and in what direction that item deviates from its distribution's mean, expressed in units of its distribution's standard deviation. The *z*-scores allow us to compare across distributions with different means and standard deviations. In these data, *z*-scores higher than 0 suggest higher than average values, and therefore areas of greater need.
[b] Covering 105 of 155 ED's in the district.
[c] Long-term illness is controlled by men aged between 30 and 59.
[d] The mental health index is calculated by taking the average of the *z*-score for private tenure, males with long-term illness, non-whites and singletons.
[e] The EDs data are based on the 1991 census.

of high need compared to the district level, but these data do not reflect the historical provision of services in this area. Site E was close to an old mental health hospital, which was closed in 1979 and the PMS site met the needs of mental health patients who resettled close by.

Prescribing

At site K, the quantity of hypnotic, anxiolytic and tricyclic drugs per patient decreased as highlighted in Table 6. There was similar but less marked change in these drugs at city level, partly reflecting the diluted effect that such prescribing was likely to have city-wide. There is a less clear trend in the SSRI drugs at site level, but overall, the ratio of tricyclic to SSRI drugs decreased at the site and city levels. There was a marked decrease in the use of opioid analgesics but an overall increase at the city level. Opioid analgesics are expected to increase with methadone use, but this is not borne out in this site. The needs of patients with substance dependence appeared to be met at the site and city levels, with an increase in the number of prescriptions per patient in Table 7.

The quantity of ADQs per patient is not calculated for site C, however, looking at unadjusted figures, the quantity of hypnotic and anxiolytic drugs used decreased, as it did across the rest of the city. There were less clear patterns in the tricyclic drugs but SSRI drugs increased as shown in Table 6. At a city level there was a clearer decrease in the quantity of tricyclics to SSRI prescribed per patient. Also there was a marked decrease in the opioid analgesics at the site but an increase at the city level, and again this is contrary to our expectations. The number of prescriptions for drugs to treat substance dependence per year increased steadily from 188 in 1996/97 to 273 in 2000/01 in Table 7.

At site L, the quantity of hypnotic and anxiolytic drugs per patient decreased as illustrated in Table 6. There were less marked changes in the numbers of prescribed anxiolytics at city level. The ratio of tricyclic to SSRI drugs decreased in the middle and end part of the study. The needs of patients with substance dependence appeared to be met at the site and city levels, with an increased number of prescriptions per patient in Table 7.

At site E, in both of its practices, the quantity of hypnotic, anxiolytic and tricyclic drugs per patient remained fairly constant as highlighted in Table 6. In addition, the ratio of tricyclic to SSRI drugs decreased, due to the increasing proportion of SSRI-based drugs prescribed. Opioid use increased in both practices but this does not appear to be related to methadone use since few patients required substance dependence drugs.

At site J, the quantity of hypnotic and anxiolytic drugs per patient remained fairly constant and the ratio of tricyclic to SSRI drugs decreased. Site J (targeting minority ethnic groups) also experienced a decrease in cervical screening (81% in

Table 6 Average Daily Quality (ADQ) prescribing for sites and cities[a]

Year	Hypnotics	Anxiolytics	Tricyclic	SSRI	Prochlorperazine	Opioid analgesics	Phenobarbitone
Site K							
1996/97	20.097	12.543	12.432	3.938	0.040	6.735	0.175
1997/98	15.528	7.825	10.997	3.157	0.093	5.230	0.020
1998/99	7.485	2.898	6.533	2.164	0.055	2.096	0.004
1999/00	4.294	1.575	4.849	2.510	0.025	1.522	0.004
2000/01	2.720	1.117	3.481	2.409	0.053	1.151	0.022
Site C[b]							
1996/97	31 540	17 803	3756	1948	30	9877	175
1997/98	17 296	9366	6398	2498	79	5885	20
1998/99	10 165	6234	6126	3801	70	3355	9
1999/00	7882	5421	5914	4585	191	2668	0
2000/01	9862	5697	7467	4812	147	2605	24
Site L							
1996/97	1.305	0.840	2.672	1.630	0.274	0.906	0.051
1997/98	1.370	0.819	3.061	2.496	0.266	0.732	0.051
1998/99	1.259	0.775	3.046	2.924	0.000	0.820	0.057
1999/00	1.122	0.712	3.200	2.764	0.223	0.963	0.059
2000/01	1.044	0.557	3.030	3.235	0.214	1.048	0.049
Site Ea							
1996/97	1.094	0.602	1.569	1.872	0.140	0.527	0.175
1997/98	1.029	0.481	1.521	2.122	0.119	0.598	0.167
1998/99	1.096	0.452	1.470	2.228	0.127	0.582	0.152
1999/00	0.963	0.414	1.457	2.378	0.203	0.785	0.167
2000/01	1.003	0.353	1.401	2.516	0.162	0.816	0.170
Site Eb							
1996/97	1.264	0.432	0.590	0.955	0.124	0.438	0.074
1997/98	1.155	0.441	0.564	1.049	0.100	0.432	0.070
1998/99	1.084	0.489	0.470	1.356	0.113	0.487	0.072
1999/00	1.203	0.473	0.551	1.582	0.131	0.651	0.063
2000/01	1.328	0.563	0.520	1.653	0.101	0.687	0.064
Site J							
1996/97	0.748	0.123	0.641	0.779	0.070	0.135	0.054
1997/98	0.727	0.153	0.669	0.790	0.077	0.160	0.046
1998/99	0.745	0.206	0.667	0.967	0.120	0.289	0.047
1999/00	0.664	0.195	0.472	1.162	0.104	0.197	0.044
2000/01	0.743	0.170	0.458	1.177	0.085	0.168	0.067
City K[c]							
1996/97	1.003	0.341	1.379	0.944	0.178	0.426	0.082
1997/98	0.964	0.345	1.397	1.220	0.181	0.481	0.078
1998/99	0.945	0.351	1.427	1.432	0.172	0.538	0.074
1999/00	0.930	0.345	1.398	1.715	0.165	0.591	0.070
2000/01	0.892	0.332	1.379	1.863	0.152	0.639	0.065
City C							
1996/97	1.750	0.512	1.564	1.284	0.234	0.550	0.082
1997/98	1.679	0.484	1.575	1.620	0.236	0.654	0.078
1998/99	1.612	0.459	1.578	1.874	0.224	0.716	0.074
1999/00	1.532	0.431	1.537	2.182	0.217	0.778	0.070
2000/01	1.450	0.404	1.486	2.370	0.201	0.854	0.066
City L							
1996/97	1.422	0.549	1.496	1.191	0.419	0.606	0.102
1997/98	1.415	0.550	1.534	1.578	0.404	0.698	0.097
1998/99	1.386	0.561	1.560	1.864	0.386	0.807	0.090
1999/00	1.334	0.555	1.549	2.166	0.376	0.882	0.088
2000/01	1.287	0.560	1.539	2.400	0.354	0.941	0.082

[a] These data were provided by the prescribing support unit.
[b] At site C, unadjusted ADQ figures are reported. The quantity of ADQs per patient is not calculated since registered patients do not accurately reflect those receiving treatment.
[c] City K is the city level data related to site K, similarly for the other sites.

https://doi.org/10.1191/1463423605pc246oa Published online by Cambridge University Press

Table 7 Substance dependence drugs: costs and quantity of prescriptions[a]

Year	Patients	Prescriptions	Costs	Prescriptions per patient	Costs per patient
Site K					
1996/97		91	302	0.152	0.503
1997/98	600	108	509	0.180	0.848
1998/99	1141	318	1321	0.279	1.158
1999/00	1422	416	2002	0.293	1.408
2000/01	1559	453	2662	0.291	1.708
Site C[b]					
1996/97	6	188	1719		
1997/98	11	103	1156		
1998/99	86	151	1148		
1999/00	170	162	1794		
2000/01	164	273	3709		
Site L					
1996/97	4887	45	352	0.009	0.072
1997/98	4960	73	309	0.015	0.062
1998/99	4957	65	350	0.013	0.071
1999/00	4998	111	737	0.022	0.147
2000/01	4889	106	1153	0.022	0.236
Site Ea					
1996/97	9826	9	11	0.001	0.001
1997/98	10 012	6	210	0.001	0.021
1998/99	10 023	9	308	0.001	0.031
1999/00	9783	4	105	0.000	0.011
2000/01	9772	20	570	0.002	0.058
Site Eb					
1996/97	7078	2	8	0.000	0.001
1997/98	7087	4	131	0.001	0.018
1998/99	7147	1	26	0.000	0.004
1999/00	7278	2	29	0.000	0.004
2000/01	7439	24	873	0.003	0.117
City K					
1996/97	634 512	1409	1056	0.002	0.002
1997/98	642 536	1596	12 481	0.002	0.019
1998/99	648 579	2176	16 357	0.003	0.025
1999/00	667 066	3039	24 149	0.005	0.036
2000/01	672 716	4272	58 884	0.006	0.088
City C					
1996/97	739 748	3128	19 268	0.004	0.026
1997/98	742 270	2720	20 746	0.004	0.028
1998/99	746 752	2432	20 712	0.003	0.028
1999/00	750 408	2508	26 113	0.003	0.035
2000/01	752 534	4557	128 557	0.006	0.171
City L					
1996/97	542 681	2124	16 394	0.004	0.030
1997/98	541 439	2542	20 786	0.005	0.038
1998/99	541 704	2446	21 515	0.005	0.040
1999/00	542 860	3096	32 364	0.006	0.060
2000/01	542 690	5117	96 992	0.009	0.179

[a] We do not include figures for site J, since less than eight prescriptions were made quarter for these drugs.
[b] At site C, costs per patient and prescriptions per patient are not calculated since registered patients do not accurately reflect those receiving treatment.

1998 fourth quarter compared to 77% in 2000) but a high achievement of immunizations for those children under two (93% in 2000 fourth quarter).

In summary, the evaluation found evidence of appropriate prescribing patterns. In addition, the number of prescriptions issued for substance dependence showed that prescriptions kept pace with the increase in patient numbers. For the site providing services within a high minority ethnic population, there were concerns over the reduced success in achieving cervical screening targets.

Discussion

The evaluation found that the PMS sites were addressing their main objectives: increasing the accessibility and the quality of care to vulnerable population groups. But in the process of this evaluation the data collection revealed difficulties in tracking the flows of PMS resources under the current budgetary system. Another part of the national PMS evaluation reached a similar conclusion (Campbell *et al.*, 2000). The five reported case studies had the most complete data. A lack of detail in these sites is a worrying sign and limits the robustness of our conclusions. In this section, we review the problems encountered in the PMS data monitoring procedures and discuss how these problems could be overcome when monitoring the 2004 contract (General Practitioners Committee, 2002).

The inequalities study included an assessment of the PMS sites' organizational development. This study found that the creation of flexible PMS contracts promoted devolved accountability. The sites were also able to respond effectively to different health care needs in spite of managerial inconsistencies (Meads *et al.*, 2004). A more detailed analysis of the managerial structures of the PMS sites is reported elsewhere (Meads *et al.*, 2003; Meads *et al.*, 2004). However, the sites failed to develop clear accounting systems to monitor the flow of resources and failed to assess their impacts. This made it difficult to assess the costs and consequences of these sites.

The problems encountered in the PMS data are summarized in Box 4. On the costs side, the integration of PMS funds into existing budgetary systems means that there is little requirement to explicitly account for the PMS monies as a stand-alone account. Historically, much of the GMS monies have been managed at the Department of Health and have been non-cash limited locally, thus local budgetary mechanisms for control and comparison do not exist. Contract monitoring focuses upon contract payments but not the additional costs borne by the site, especially in terms of managerial support or provision of rooms and offices. In addition, the focus is upon the overall spend; for example, staff expenditure often does not record the whole-time equivalent of staff or staff-skill mix. In some cases, expenditure categories do not include the full costs; for example, computing costs often do not include technical support.

Box 4 Elements that contribute to difficulty in evaluating PMS sites

1) The objectives of individual PMS sites are not necessarily clearly defined with adequate specificity.
2) There is a lack of clear distinction between capital and recurrent funding.
3) There is a tendency to amalgamate PMS funding with existing monies.
4) There is a dearth of information on the resource flows specifically associated with the PMS scheme.
5) There is difficulty in specifying relevant outcome measures.

On the outcome side, contract monitoring evaluates PMS sites' achievements by organizational and clinical change (such as the establishment of disease registers or creation of new clinics) rather than process or activity data (such as site referrals, number of consultations and quantity/quality of drug prescribing). In addition, databases that monitor target payments prior to PMS, such as immunizations, are no longer routinely maintained. There is also a failure to discriminate between outcomes related to the PMS sites and those related to other initiatives (e.g., mobile units). Finally, the impact of the PMS scheme on other services is not routinely monitored. For example, the extent that PMS services substitute for other secondary services, such as psychiatric services. Referrals information would be one source of data, but in most cases this is unavailable or available for one year only.

The transfer of PMS resources into existing services coupled with the above problems necessarily

means that the focus is on translating expenditure into resource input levels with little regard to changes in outcomes or accounting for PMS-specific resource flows. To monitor future monies adequately it is essential that the financial frameworks of the PCGs and PCTs are harmonized with those of the PCT sites. Without this harmonization it will be difficult to evaluate the PMS sites and assess the impact of transferring patients from secondary to primary care.

The recently implemented GP contract can learn from both the GMS and PMS contracts. The GMS contract uses a mixture of annual allowances, capitation and target payments (termed fee-for-services), whilst the PMS contract uses capitation and allowances.

Different payment structures offer varied financial and reporting incentives. Target payment income is linked directly to the volume of services provided whereby incentives are placed on those providing the services. This ensures that adequate information is maintained and evidence of targets is attained, which is a distinct advantage of this approach. The disadvantage is that they provide an all or nothing incentive structure. Once a predefined population level target has been achieved, they provide no incentive to offer care over and above this level. Furthermore, if a site cannot reach the target, there may be a perverse incentive not to provide any care in that area at all. In contrast, capitation payments and allowances are not linked to the volume of services. The disadvantage of this approach is that there is no incentive on the site to provide information and there is a financial incentive to minimize workload or to provide increased volume of health care that is not necessarily compatible with improving patient outcomes. The onus is on the PCT to audit sites to ensure that the goals are being reached. To do this effectively requires ring-fencing of accounts, defined by capital and revenue, to ensure that resource flows can be recorded and mapped against the attainment of such objectives. Moreover, this auditing may be administratively costly. In 2002, these considerations led to the World Health Organisation to recommend that mixed funding arrangements are the most effective (Boelen *et al.*, 2002).

The 2004 GP contract appears to have taken on board the need to link financial incentives to provision of information, and has capitation and target payments (termed quality and outcome markers). It is also evident that attention is been paid to ring-fencing monies for target payments. The use of existing measures of intermediate outcomes, such as the percentage of patients screened and meeting reduced cholesterol reduction and blood pressure targets, as measures of efforts to reduce ischaemic heart disease should allow more effective performance monitoring.

For future NHS reforms we recommend a number of changes that could be made to overcome the problems experienced in this evaluation of PMS. First, more attention should be given to recording capital and recurrent funds, and to separately evaluate the impact of these funds. This includes developing meaningful expenditure categories, and recording the components that make up these expenditures. Secondly, more attention should be given to the contributions of alternative stakeholders in the financing and monitoring of the contract. For example, it may be more appropriate to consider a package of services or to monitor the impact on secondary care services using referrals, and accident and emergency use. Thirdly, there is a need to collect detailed baseline data, even though these data are collected under different contractual arrangements. Finally, it would be useful to link intermediate targets to medium- and long-term changes in health outcomes, possibly using Markov models (Sonnenberg and Beck 1993), to help clarify the overall impacts on health. Without these changes, it will be hard to evaluate what aspects of the site are pivotal in the achievement of the site's overall targets and to make comparisons overtime. This is a particularly important assessment given the government has placed great emphasis on contractual changes to increase access, but needs to know at what costs these changes are achieved.

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