

FINAL REPORT
for the
AMERICAN PHARMACEUTICAL GROUP

**HEADROOM FOR INNOVATION IN
PRIMARY CARE**

**TURNING HIGHER NHS SPENDING INTO MORE AND BETTER
HEALTH CARE**

A division of the Office of Health Economics
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Submitted by:

OHE Consulting
Office of Health Economics
12 Whitehall
London
SW1A 2DY
UK

For further information please contact:

Jon Sussex
Associate Director
Tel: +44 (0) 20 7747 1412
jsussex@ohe.org

Report prepared by:

Jon Sussex (OHE Consulting)
Anne Mason (Centre for Health Economics, University of York)
Clive Pritchard (OHE Consulting)
Peter Yuen (OHE Consulting)

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List of Abbreviations Used

BMA	British Medical Association
CFISSA	Centrally Funded Initiatives and Services and Special Allocations
CHMS	Central Health and Miscellaneous Health Services
DoH	Department of Health
GDS	General Dental Services
GMS	General Medical Services (i.e. services provided by GP practices)
GMSCL	General Medical Services – Cash-limited
GMSNCL	General Medical Services – Non-cash-limited
GOS	General Ophthalmic Services
GP	General medical practitioner (i.e. primary care physician)
GPC	General Practitioners Committee of the British Medical Association
GPS	General Pharmaceutical Services
HA	Health Authority
HCFHS	Hospital, Community and Family Health Services
HCHS	Hospital and Community Health Services
HMT	Her Majesty’s Treasury
NDPB	Non-departmental Public Body
NHS	National Health Service
NSAID	Non-steroidal anti-inflammatory drug
PCO	Primary care organisation
PCT	Primary Care Trust
PDS	Personal Dental Services
PMS	Personal Medical Services
PPIs	Proton pump inhibitors
PSS	Personal Social Services
R&D	Research and development
RCT	Randomised controlled trial
SHA	Special Health Authority
SMC	Scottish Medicines Consortium
SSRI	Selective serotonin reuptake inhibitor
StHA	Strategic Health Authority

Executive Summary

Introduction

The UK government has committed itself to a major, sustained increase in funding for the National Health Service (NHS). There is great public interest in seeing how the extra billions are being spent, and how much extra or better health care they are buying. The rate of uptake of innovative technologies, including medicines, has so far been slower in the UK than in the US and numerous other countries. Will this change?

The terms of reference of this study by OHE Consulting for the American Pharmaceutical Group are as follows:

Focusing on the uptake of innovative medicines and other new technologies in primary care, to:

1. determine how the NHS in England¹ is *supposed* to allocate additional resources, and the extent to which this is consistent with achieving more and better health care and better health outcomes. The impact of National Service Frameworks and National Institute for Clinical Excellence (NICE) guidance is an important part of this;
2. assess what happens to additional NHS resources *in practice*, and why; i.e. how they actually are allocated and how National Service Frameworks and NICE guidance are acted upon;
3. draw conclusions and make recommendations.

The study is based on reviews of the academic and government/NHS literature, clarificatory discussions with Department of Health and NHS officials, and interviews with a sample of GPs acting as prescribing leads for NHS Primary Care Trusts (PCTs). The analysis was largely undertaken over a four month period from late October 2002 to late February 2003, with some further information gathering and updating in May and June 2003 in the light of the new national General Medical Services (GMS) contract.

Context – NHS Take-up of New Primary Health Care Technologies

Data published by the Department of Health and the Association of the British Pharmaceutical Industry (PICTF 2002) show that uptake of innovative medicines is much slower in the UK than in other economically developed countries.

The Treasury-commissioned Wanless Report into long-term health care expenditure requirements in the UK (Wanless 2002) identified slow uptake of new technologies as an important factor leading to poorer population health and higher health care expenditures.

¹ Financial flows and institutional arrangements within the NHS differ between the four countries of the UK. This study specifically concerns the NHS in England, but many of the findings should also be of interest in other parts of the UK.

NHS National Service Frameworks and the guidance produced by the National Institute for Clinical Excellence (NICE) are supposed to improve the quality of, and reduce inappropriate local variations in, NHS services. The coronary heart disease and mental health National Service Frameworks have indeed led to increased prescribing in those disease areas. But compliance with NICE guidance appears to be partial, despite a legal requirement since January 2002 that funding be available for full implementation. Major health care charities, including Rethink (schizophrenia) and CancerBacup, have found that uptake is uneven around the country.

Even if technologies mandated centrally by the NHS via National Service Frameworks and NICE guidance are taken up accordingly, this may lead to the neglect of other technologies, no matter how potentially beneficial, simply because they have not yet been reviewed centrally.

Mechanism of NHS Resource Flows

Tracing the flow of resources through the NHS in England is not a straightforward task. The vast majority of expenditure on prescribing and other technologies in GP practices comes from PCTs' cash-limited 'unified budgets', which cover 76.9% of total English NHS revenue resources (i.e. excluding capital investment) in 2002/03. The 'unified budgets' are allocated by the Department of Health on the basis that 15.0% of them, on average, will be spent on primary care prescribing and another 2.7% on other cash limited expenditure by GP practices (which excludes the pay of the GPs themselves).

Not all ring-fenced funds are being spent on the ends for which the Department of Health intended them. The Audit Commission (2003b) found that in half of PCTs and mental health trusts, and in more than one third of acute trusts, the Commission's auditors were not satisfied that "adequate arrangements were in place to ensure that growth monies were used for their intended purposes". The NHS's national cancer director, Professor Mike Richards, told the House of Commons Science and Technology Select Committee that not all of the 'hypothecated' £255 million promised in the 2001 NHS cancer plan had got through to cancer services (Science and Technology Committee 2002, question 23).

Historical levels of expenditure are a major determinant, but PCTs do nevertheless have discretion over the amount of funds allocated to primary versus secondary care. GPs can (and do) ignore the indicative prescribing budgets they are set by their local PCT. If primary care costs, including prescribing, exceed budgeted amounts, the excess has to be funded by reducing other areas of PCT expenditure.

Factors Affecting Uptake of New Technologies in Primary Health Care

Our review of the published literature, focussing on that pertaining to primary care in the UK, identified numerous factors expected to affect the uptake of technologies in primary health care. The process leading to decisions to use new technologies is complex and unclear.

At the centre of the process is the GP-patient relationship. By definition, GPs are generalists who adopt a more holistic approach than specialists towards their patients. GPs appear reluctant to take on new roles, where these are perceived to be the domain of the specialist. New treatments are tried out with caution on a small number of patients and the effect on

these patients is monitored carefully. Much importance is attached by GPs to the feedback they receive about a treatment from their own patients.

Many studies in the literature comment on the influence of the patient on the GP's prescribing decisions. One study found that patients sometimes declined the GP's offer to switch their medication to a more evidence based alternative. Patient demand for new technologies could also sometimes influence the GP and patient groups were found in one study to exert influence, particularly over prescribing of new medicines for rare conditions. However, none of the 20 GPs we interviewed mentioned patients when invited to list the factors affecting decisions on whether to introduce new technologies in primary care.

Beyond the GP-patient relationship, hospital consultants are important sources of information for GPs and secondary-care led prescribing is common.

GPs' partners and peers may also be influential, although apparently more in the direction of encouraging restraint than in encouraging uptake of new technologies.

Pharmaceutical company sales representatives may also be an important source of information about medicines, responsible for raising product awareness among GPs.

Evidence of the impact of Health Authority staff, including prescribing advisers, is mixed; some studies detect an influence but others do not. It is too early for evidence to be available on whether the advent of PCTs has made any difference in this regard.

The power of central NHS mandate to stimulate uptake of some primary care technologies, particularly medicines, was reported to be strong according to the large majority of the PCT prescribing leads we interviewed. They were referring to National Service Frameworks and NICE guidance, compliance with which is currently a top priority in the NHS backed up by inspection and performance rating in the first case and legal requirement in the second. Where central policies are less forcefully backed-up, the power of policy makers to impose new technologies was shown to be weak.

It might be expected that a reason for low rates of uptake of new technologies in primary health care might be lack of funds. But our literature review uncovered little support for this in primary care. Cost was generally secondary to other considerations, such as effectiveness and tolerability, except where therapeutic equivalence was perceived to exist.

However, most studies in our literature review predate important changes to the NHS that have happened since 1999: the creation of Primary Care Trusts, National Service Frameworks and NICE, and the inclusion of GP prescribing within a cash-limited PCT budget. All of these things may have important impacts on the diffusion of technologies in primary care, but the nature and scale of these impacts has not yet been demonstrated.

In contrast to the literature review, three quarters of the PCT prescribing leads we interviewed in early 2003, said that even with increased NHS funding they still had insufficient to permit investment in local initiatives. All of the available funding was being taken up in satisfying centrally mandated expenditures, complying with National Service Frameworks and NICE guidance.

The potential for central NHS direction backed by financial incentives to drive the uptake of particular technologies in primary care was reinforced by the findings of our follow-up interviews about the expected impact of the new GMS contract. Nearly all of the PCT prescribing leads who responded (15/17) considered that the financial rewards in the new GMS contract for GP practices which hit quantified ‘quality framework’ targets would lead GPs to focus on the technologies needed to achieve those targets. On the other hand, 12/17 respondents considered that non-targeted technologies, including new technologies, would be likely to receive less attention than those specified in the contract.

As the new GMS contract specifies well-established rather than particularly new technologies, it implies at best no incentive for greater uptake of new technologies and quite possibly a weakening of such incentives. This adverse effect could only be avoided if there were to be an effective, rapid and continuous process for including cost-effective new technologies among those specified in the contract. Sadly, the GMS contract lacks a process with those characteristics.

Spending the Extra NHS Resources in Primary Care: Theory and Practice

Our telephone interview survey of 20 GPs acting as prescribing leads for their respective PCTs obtained their views on the uptake of new technologies in primary care in practice.

The main message from our interviews is that centrally determined requirements as expressed by National Service Frameworks and NICE guidance are absorbing much, and in many cases all, of the additional funding in primary care. Whether the extra money is permitting full compliance with these central requirements is unclear. But 18/20 of the PCT prescribing leads we interviewed considered that there is broad compliance in their PCT with National Service Frameworks. Sixteen out of 20 mentioned NICE guidance as being a driver of new or increased primary care spending.

While the extra money going into the NHS is welcome, the GP prescribing leads considered that little or none of it has so far been available for discretionary local development of new services by GPs or for introduction of new medicines, unless mandated by NICE guidance or National Service Frameworks.

Secondary care and paying off PCTs’ accumulated debts are commonly seen by this group of GPs as taking the lion’s share of increased funding. However, we note that, to the extent that debt repayment is a one-off activity, the funds hitherto devoted to that may become available for additional NHS activity in future years.

Over the next few years a continuing stream of further central mandates – new National Service Frameworks and NICE guidances – will be applied to the NHS. The new GMS contract and the NHS performance management system reinforce the tendency to determine centrally rather than locally the ways in which PCTs and GPs spend the NHS’s resources.

Conclusions

The flow of funds through the NHS is difficult for an outside observer to plot in detail. Leaving aside the remuneration of GPs and other primary care practitioners, the share of

NHS funding that reaches the front line of primary care is determined both by formulae and by discretion exercised at various levels from the Department of Health to the individual GP.

We have sought the reasons for slow uptake of innovative technologies in primary health care in two ways: a review of the published literature and interviews with 20 GPs acting as PCT prescribing leads. The two lines of inquiry have produced answers that differ in important ways. In particular, the interview respondents highlighted insufficient funds, given the demands of central mandates, as a major constraint, whereas the literature review implied that cost was only of secondary importance for determining uptake. These differences in the findings may reflect major changes that have been made to the NHS since 1999:

- unified budgets for PCTs (and for the HAs that preceded them) which include, for the first time, GPs' prescribing expenditure within the cash-limited total;
- National Service Frameworks backed by strong Government pressure on local NHS bodies to implement them;
- NICE, producing guidance on which health technologies are cost-effective for the NHS and for which, since January 2002, PCTs have been obliged to make funds available.

Nearly all of the studies referred to in the published literature pre-date those changes, whereas the interviews were undertaken in January and February 2003.

The apparent discrepancy between findings from the literature review and from the telephone interviews may also be due to the particular role of the interviewees. The literature focuses on GPs making decisions in their normal clinical practice. It appears that, in this context, GPs in general pay little attention to cost or to financial constraints. However, the people we interviewed were not just GPs but also active participants in their local PCT and so were likely to be greatly aware of PCTs' financial constraints.

The main factors, but not the only ones, affecting directly or indirectly the uptake of new technologies in primary health care are presented by the literature as being:

- GPs' personal clinical experience;
- specialist clinicians – both by initiating prescribing and by providing a local leadership role encouraging the use of new technologies;
- GPs' colleagues and professional peers;
- pharmaceutical company representatives.

HA prescribing advisers were found to have influence in some, but not all, studies.

The influence of central policy makers seems to depend heavily on the priority attached to a particular policy; in particular the extent to which financial rewards, performance ratings and managers' jobs depend on achieving them.

The new GMS contract contains both an opportunity to improve uptake of new primary health care technologies and a threat. The opportunity arises from two sources. The first is the extent to which the new GMS contract includes cost-effective new technologies among those whose use is directly incentivised by provision of increased funds to practices that use them. The second arises from the change in mood represented by the new contract, from one in which GPs face obstacles to local initiatives to develop new services, to an environment in which they may be explicitly rewarded for providing ‘enhanced services’ with the agreement of the local PCT.

The threat is that the ‘quality framework’ proposed in the new contract could turn into an inflexible central mandate to use specified technologies but which by default ignores all other technologies. Thus the desirable aim of improving some aspects of quality may also have the undesirable effect of delaying the use of, or even squeezing out entirely, cost-effective new health technologies because there is a lag of some years before they may get written into the GMS contract.

Our overall conclusion is that encouraging greater uptake of cost-effective new technologies in primary health care requires funding not only to implement NSFs and NICE guidance, but also to provide headroom for local discretion, plus incentives and information so that the headroom will be exploited to the benefit of patients.

Recommendations

We recommend that PCTs be required explicitly to ring-fence some funds for new primary health care technologies that are reasonably expected, or already known, to be cost-effective.

For the quality framework of the new GMS contract to encourage, and not obstruct, cost-effective innovation, a mechanism must be set up to enable speedy inclusion of new cost-effective technologies in the framework as they arise in future.

PCTs should be required to state in their annual reports to their local populations how much they have spent on providing what quantities of which new primary health care technologies and services. This would enable monitoring, both by NHS bodies and by the general public, and comparison of the performance of different PCTs in this respect.

Some or all of the PCT ring-fenced funds recommended above should be paid to GP practices on the basis of their achieving target rates of uptake of locally-specified new technologies.

PCTs should expand their current efforts to deliver advice and assistance to GPs concerning new technologies actively, whether via pharmaceutical advisers or others.

Giving specialist consultants an explicit role, and time to carry it out, in advising and helping their primary care colleagues is already being tried piecemeal around the country. We recommend that these initiatives be more explicitly encouraged and stimulated nationally.

1. Introduction

Public expenditure on the UK National Health Service (NHS) has been greatly increased over the last few years and the government has promised further large rises. How far these extra resources turn into more and better health care is of concern to everyone.

As a contribution to assessing how far extra NHS resources may turn into more and better health care, the American Pharmaceutical Group has commissioned this study by OHE Consulting. The study focuses on primary care, which is by far the most frequently accessed source of health services. In particular we have looked at how the extra NHS resources might improve the uptake of medicines and other new forms of treatment and care. We have taken ‘new’ technologies to mean those that have become available in the UK during approximately the last five years.

The American Pharmaceutical Group was set up in 1985 and represents 11 US pharmaceutical companies which operate in the UK and supply medicines to the NHS. The member companies are significant investors and employers in the UK. The APG aims to improve understanding of the contribution to UK health care of the pharmaceutical industry, and of the US companies in particular, and to contribute to health care policy and debate.

1.1 Terms of Reference

The terms of reference for the study are as follows:

Focusing on the uptake of innovative medicines and other new technologies in primary care, to:

1. determine how the NHS in England² is *supposed* to allocate additional resources, and the extent to which this is consistent with achieving more and better health care and better health outcomes. The impact of National Service Frameworks and National Institute for Clinical Excellence (NICE) guidance is an important part of this;
2. assess what happens to additional NHS resources *in practice*, and why; i.e. how they actually are allocated and how National Service Frameworks and NICE guidance are acted upon;
3. draw conclusions and make recommendations.

² Financial flows and institutional arrangements within the NHS differ between the four countries of the UK. This study specifically concerns the NHS in England, but many of the findings should also be of interest in other parts of the UK.

1.2 Method

The material for the study consists of reviews of the academic and official (government/NHS) literature, clarificatory discussions with Department of Health and NHS officials and interviews with a sample of GPs acting as prescribing leads for NHS Primary Care Trusts (PCTs). The analysis was undertaken over a four month period from late October 2002 to late February 2003, with some further information gathering and updating in May and June 2003 in the light of the new national NHS General Medical Services contract for GPs. The main stages of the analysis were:

- a review of the official and related literature in order to establish how much discretion, or not, is supposed to exist at each stage along the path followed by NHS funds in England from the Treasury to the individual GP; who is supposed to exercise that discretion; and what incentives and constraints they face. The way in which National Service Frameworks, NICE guidance and other policies are supposed to be traded off was identified;
- verification and clarification of the findings of this review with Department of Health officials and NHS managers;
- a review of the published literature on the impact of guidance on primary care and what affects the uptake of recommended technologies;
- telephone interviews with 20 GPs acting as PCT prescribing leads. Interview subjects were found by contacting prescribing leads who responded to an OHE/University of York Centre for Health Economics 2001 questionnaire survey of primary care organisations and hospital pharmacists (the MANMED survey). The interviewees were asked, during January/February 2003, their views on how additional NHS resources are likely to be allocated in practice, given current arrangements; and also to suggest options for better ensuring that additional funding leads to more and better health care. The views of the same 20 GPs were then sought in May 2003 on whether the ideas in the proposed new GMS contract would imply any impact on these issues.

The findings of the first two stages, concerning the flow of funds through the NHS, are detailed in section 3 below. Section 4 draws conclusions from the literature review and the interview programme concerning the factors affecting the uptake of primary health care in England. Based on further information from the interviews, section 5 then discusses how extra NHS funds appear likely to be allocated in primary care. The overall conclusions from the study are in section 6. Recommendations for improving the uptake of worthwhile innovative health technologies in primary care are set out in section 7.

2. Context – NHS Take-up of New Primary Health Care Technologies

2.1 Uptake

The UK government has committed itself to a major, sustained increase in funding for the National Health Service (NHS). As a result, the share of UK GDP spent on the NHS³ has increased from 5.6% in 1998 to 6.4% in 2001 and is planned to grow rapidly to 8.2% of GDP by 2007/08. The government has been applauded for this investment in the country's health care. The inevitable corollary is that there is, and will continue to be, great public interest in seeing how the extra billions of pounds are being spent, and how much extra or better health care they are buying.

National Service Frameworks and the guidance produced by NICE are intended to point the way to where health care resources may most fruitfully be directed. But the speed and extent of compliance today with NICE guidance and National Service Frameworks is unclear.

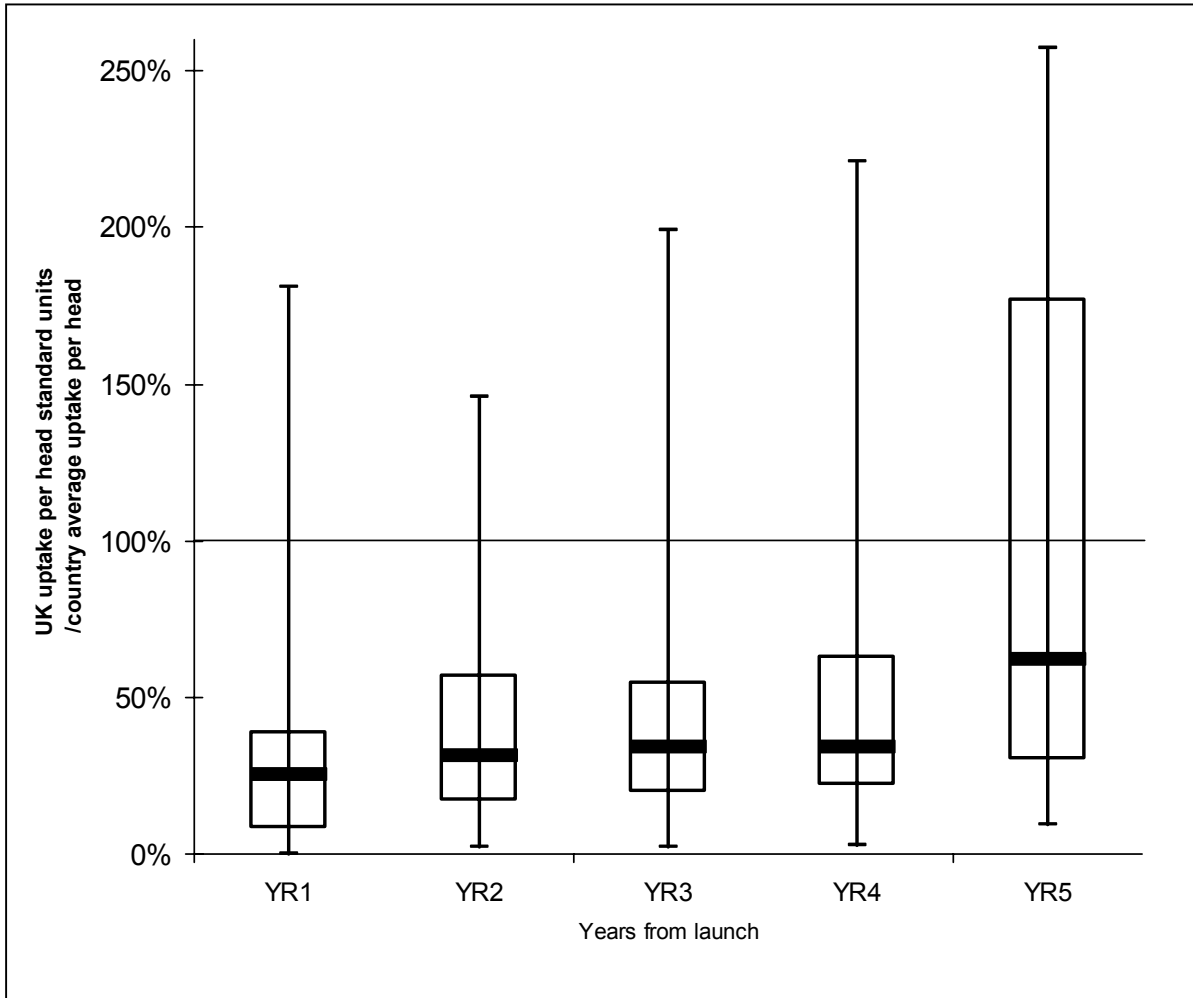
Hitherto the NHS has been slow to take up innovative medicines and other new health technologies. Data published by the Department of Health and the Association of the British Pharmaceutical Industry (PICTF 2002) and summarised in Figure 2.1 show that the average rate of use per person of new medicines in the UK in the first year they become available is only 25% of that in comparator countries. Although the UK gradually catches up with other countries, the average rate of use of new medicines in the UK five years after launch is still only 62% of the rate of use in the comparator countries.

Other data from PICTF, presented in Figure 2.2, show that the percentage of the UK medicines market by value that is accounted for by products launched within the last five years is around 16% in the UK, compared with 25% in Germany and 32% in the US. Only Japan has a lower proportion of its medicines expenditure going to new products. Furthermore, the percentage of the UK medicines market taken by new products (on the PICTF definition) has declined slightly since 1998, whereas in every other country shown in Figure 2.2 that percentage grew over the same period. Thus the large increases in NHS funding since 1998 do not yet seem to be leading to any relatively greater use of new medicines.

The Treasury-commissioned Wanless Report into long-term health care expenditure requirements in the UK (Wanless 2002) identified slow uptake of new technologies as an important factor leading to poorer population health and higher health care expenditures. Wanless's "slow uptake" scenario assumed that "the uptake of new technologies is relatively slow" (para. 3.16), while in the other two scenarios he investigated, with healthier populations and lower health care expenditures, "uptake of appropriate technology is assumed to be rapid and effective in both" (para. 3.22).

³ The 1998 and 2001 figures are from OHE 2002 (Table 2.7). The 2007/08 projection is from HM Treasury 2002 (Table 7.3).

Figure 2.1: Population-adjusted standard units sold per month of a sample of 41 major medicines launched in the UK since 1997 compared to average consumption in other countries

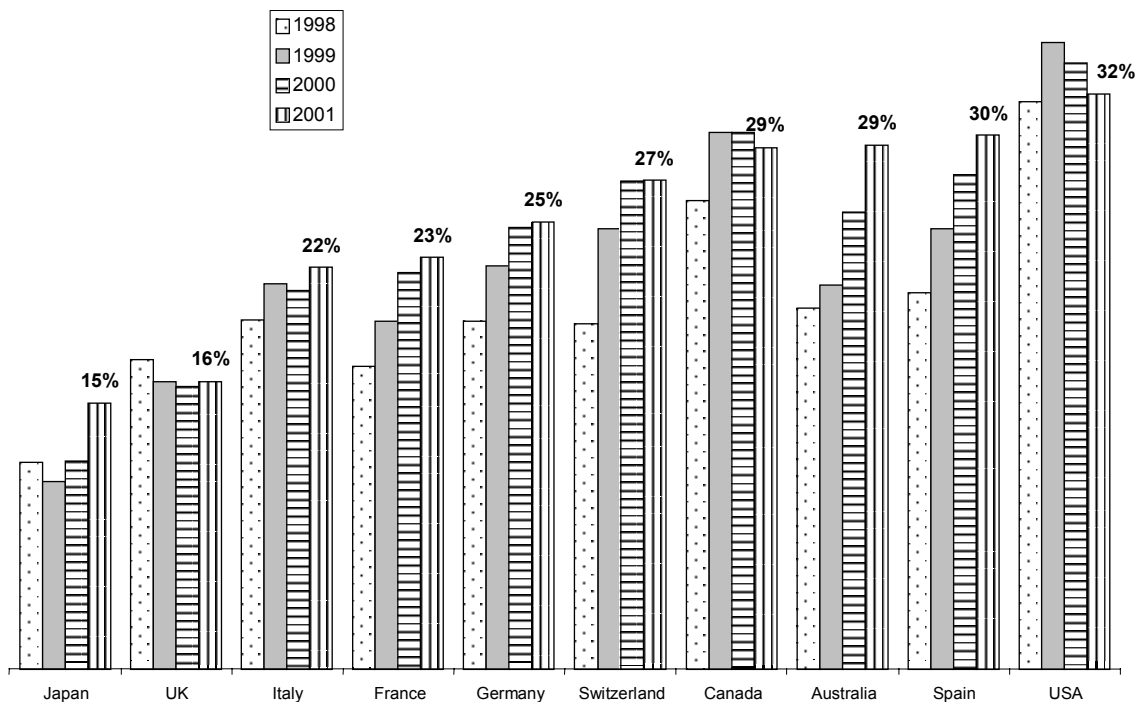


Notes: The values used to generate this chart are UK average monthly consumption per head for each year since launch, measured in standard units, of 41 medicines launched in the UK since 1997, divided by average consumption across those of the other PICTF comparator country markets where the medicine is available. The PICTF comparator countries are: Australia, Canada, France, Germany, Italy, Japan, the Netherlands, New Zealand, Spain, Sweden, Switzerland and US. A value above 100% would mean that UK consumption per head is above the average of the comparator countries.

For each year after launch, the box represents the interquartile range, which contains the middle 50% of values. The thick line across the box indicates the median medicine's value. The whiskers that extend either side of the interquartile box show the highest and lowest values.

Source: PICTF 2002 (indicator 16).

Figure 2.2: Percentage, by value, of national pharmaceuticals market accounted for by products launched within the last five years.



Source: PICTF 2002 (indicator 19).

The Prime Minister's Pharmaceutical Industry Competitiveness Task Force (PICTF) found that the general picture of slow uptake referred to above, applied equally to new medicines commonly prescribed in primary care settings. PICTF 2001 presented data for fluoxetine (an SSRI), simvastatin, zolmatriptan and rofecoxib (a Cox II inhibitor), all of which are prescribed in primary care. In all four cases, uptake was slow in the UK relative to many other countries.

Primary care is evidently intended by the government to be an important, but not dominant, destination for the increased funds now flowing to the NHS:

- the Chief Executive of the NHS in his recent end of year report (Department of Health 2002b) highlights increased expenditure on medicines, many of which will have been prescribed by primary care doctors; and refers to 600,000 procedures having been carried out by primary care staff in 2001/02 that would previously have been carried out in hospitals;
- the NHS Modernisation Board in its latest Annual Report (NHS Modernisation Board 2003) highlights greatly increased prescribing of several medicines used in primary care – cholesterol-lowering medicines (mainly statins), and medicines for

diabetes, arthritis, Alzheimer's disease and smoking cessation – alongside a large number of other NHS developments;

- the latest set of NHS national planning priorities and targets, covering the next three years 2003/04 to 2005/06, specifies a total of 46 key targets “which every health and social care community must plan to meet” (Department of Health 2003a).⁴ Of these, 14 appear to refer, directly or indirectly, to primary care.

The Wanless report repeated the commonly held view that: “The balance of health and social care is still skewed too much towards the use of acute hospital beds. More diagnosis and treatment should take place in primary care.” (Wanless 2002, 4th para., 7th page of Derek Wanless' covering letter to the Chancellor of the Exchequer).

2.2 National Service Frameworks and the National Institute for Clinical Excellence

The UK government has in recent years established new bodies with the aim of helping the NHS to improve the quality of, and reducing inappropriate variations in, health services. Service and treatment standards in England are set by NICE and by National Service Frameworks issued by the Department of Health. The Commission for Health Improvement is responsible for monitoring achievement of those standards. The increased funding awarded to the NHS is intended by the government to enable achievement of these standards.

National Service Frameworks define service models for particular patient groups and disease areas. In time all NHS services throughout England are expected to conform to those service models. Where existing services fall short of the National Service Framework this implies a need for increased resources. This should, in turn, lead to increased uptake of a range of health technologies, including many in primary care. These include some new technologies, but the lengthy process of determining and disseminating National Service Frameworks means that updating will not be frequent. Hence there could be long lags before worthwhile new technologies arising in future would be incorporated into National Service Frameworks.

The programme of National Service Frameworks was launched by the Department of Health in April 1998 and has so far (by late June 2003) covered:

- mental health for adults to age 65 (September 1999);
- coronary heart disease (March 2000);
- the national cancer plan (September 2000);
- older people (March 2001);

⁴ Appendix B of Department of Health 2003a lists the 46 key targets.

- diabetes (standards published December 2001; delivery strategy published January 2003);
- children (hospital services standards published April 2003; remaining parts of the National Service Framework for Children and Young People due to be published in 2003 or 2004).

Further National Service Frameworks are in preparation for renal services and long-term conditions, focusing on neurological conditions.

National Service Frameworks may specify particular technologies where increased expenditure is recommended. The *Chief Executive's Report to the NHS, December 2002* (Department of Health 2002b) highlights increased levels of prescribing in England of medicines covered by the coronary heart disease, mental health and diabetes National Service Frameworks. These data are reproduced in Table 2.1. It shows, for example, that the number of prescriptions for lipid lowering medicines, including statins, grew by 30% in 2001/02 over the previous year, with expenditure on them (measured at net ingredient cost) increasing by 33%. Together these top five groups of medicines accounted for well over half the total £540 million growth in the primary care medicines bill in 2001/02 (Audit Commission 2003a, Table 2).

Table 2.1: Top 5 British National Formulary (BNF) sections in terms of increase in net ingredient cost of prescription items dispensed in the community

		Anti-hypertensive therapy	Lipid-regulating medicines	Medicines used in diabetes	Anti-depressant medicines	Medicines used in psychoses and related disorders
Prescription items (million)	2000-01	22.059	11.082	16.449	22.634	5.857
	2001-02	25.995	14.371	18.641	24.787	5.680
	% change	+18%	+30%	+13%	+9%	-3%
Net ingredient cost (£m)	2000-01	371.586	351.326	238.776	309.081	106.785
	2001-02	438.022	466.261	293.733	353.079	140.698
	% change	+18%	+33%	+23%	+14%	+32%

Source: Table 2.7 of *Statistical Supplement to Department of Health, 2002b*. That table quotes as its source: 'Prescription Cost Analysis Database'

According to the Department of Health's *Expenditure Report* published on 1st April 2003 (Department of Health 2003b), out of a £5.2 billion increase in cash spending by the NHS in England in 2002/03, £850 million (a little over 16%) went on increased medicines expenditure. £650 million of that was increased prescribing in primary care. The five categories of medicines identified as showing the greatest percentage expenditure growths, are said to account for "around half of the forecast growth"

(Department of Health 2003b, paragraph 2.2.5). These five categories of medicines were: statins (lipid-regulating medicines), anti-hypertensives, diabetes medicines, anti-depressants and ulcer healing medicines. The first four of these categories had also been among the five fastest growth areas the year before (as shown in Table 2.1).

Compliance with the Department of Health's National Service Frameworks is monitored and incentivised within the NHS's performance assessment framework. The pressure for NHS organisations, including PCTs and GP practices, to allocate funding to permit compliance with National Service Frameworks, will be subject to many factors, as discussed in section 4 below. But there is no legal obligation for NHS funds to allocate to these ends all of the funds necessary to achieve the service standards specified.

In contrast, providing adequate funding to permit compliance with technology appraisal "guidance" published by NICE is now a legal requirement. The direction under the NHS Act 1977 states that with effect from 1st January 2002 every PCT in England (and Health Authority/Board in Wales):

"shall, unless directed otherwise by the Secretary of State, apply such amounts of the sums paid to it as may be required so as to ensure that a health care intervention that is recommended by the Institute [NICE] in a Technology Appraisal Guidance is, from a date not later than three months from the date of that Technology Appraisal Guidance, normally available:

- (a) to be prescribed for any patient on a prescription form for the purpose of his NHS treatment; or
- (b) to be supplied or administered to any patient for the purpose of his NHS treatment."

The financial implications of NICE recommendations are to be met from PCTs' unified budgets (Department of Health, 2001d, paragraph 11).

Between its establishment in April 1999 and the end of 2002, NICE produced 54 completed appraisals of health care technologies, both medicines and other types of technologies, many of them new (NICE 2002a)⁵. The overall net financial impact of the first 50 of these was estimated by NICE to be to increase annual NHS costs in England and Wales by more than £570 million if fully implemented (NICE 2002b). Despite the legal requirement on PCTs to provide funding for implementation of NICE guidance, compliance is in practice not immediate and in full. Increased spending happens over a period of years, if at all, not all at once. The Department of

⁵ NHS Quality Improvement Scotland has a limited programme of health technology assessment, similar to that of NICE. However, its main work in the area of health technology assessment has been commenting on the applicability of NICE's guidance to Scotland. The Scottish Medicines Consortium (SMC) undertakes to provide NHS Scotland with guidance on all newly licensed medicines, new indications and new formulations (but does not look at non-medicine technologies). The All Wales Medicines Strategy Group performs a similar role in Wales where the cost of a medicine is expected to exceed £2,000 per patient per year. Guidance is considered interim if NICE undertakes its own appraisal. There is currently no comparable organisation in Northern Ireland.

Health attributes £216 million of the estimated growth in English NHS medicines expenditure in 2002/03 to “implementing NICE guidance” (Department of Health 2003b, paragraph 2.2.6).

A proportion of the technologies appraised by NICE are solely or predominantly used in secondary, rather than primary, care. No appraisals of primary care technologies other than medicines have so far been published by NICE. NICE’s technology appraisal guidance is in principle meant to affect primary care uptake of a range of medicines, including increased spending on Cox II inhibitors for osteoarthritis and rheumatoid arthritis, bupropion and nicotine replacement therapy for smoking cessation, and atypical antipsychotics for schizophrenia. Whether this expected impact is occurring in practice is a matter of controversy.

Major health care charities are arguing that, despite increased NHS funding, uptake of cost-effective medicines is uneven. The schizophrenia charity Rethink published in December 2002 the findings of an October 2002 survey of Primary Care Trusts (PCTs) which showed that 20% of them had not implemented NICE guidance on atypical anti-psychotics published in March despite an obligation to do so (Rethink 2002). CancerBacup published a study in November 2002 showing that half of all NHS cancer networks had not received their expected allocation of funds for treating cancer patients in 2001/02, and that the shortfalls were often large (CancerBacup 2002).

The House of Commons Health Committee’s report on NICE shows that the Committee was presented with conflicting evidence. ABPI analysis presented to the Committee showed under-implementation of NICE guidance, with actual increases in prescribing of NICE-approved medicines only totalling up to one third of NICE’s projected estimates. Professor Alan Maynard, University of York, on the other hand, cited to the Committee the example of rosiglitazone for diabetes, where actual NHS expenditure had “far outstripped NICE’s estimates” (Health Committee 2002, pages 22 and 23).

The debate between NICE and the pharmaceutical industry has continued unresolved since, with each side pointing to examples of where prescribing levels appear to have changed following, and in the direction implied by, NICE guidance or where no such change can be detected. There has been similarly unresolved debate about whether low uptake preceding a favourable NICE judgement about a medicine, followed by growing use thereafter, reflects ‘NICE blight’, i.e. unwillingness by prescribers to prescribe treatments before they have been reviewed by NICE.

The Select Committee concluded that the uncertainty needed to be resolved and they recommended “that the Government ensures the systematic monitoring of the implementation of NICE guidance” (Health Committee 2002, page 24). Since the Select Committee reported, NICE has commissioned research from health economists at the University of York to evaluate the impact of NICE guidance on the rate of use of affected medicines and other treatments. The findings of this research are due in late 2003. At least until the results of that research are known, the impact of NICE guidance on uptake of health technologies reviewed by NICE will remain controversial.

Even more controversial is the impact of National Service Frameworks and NICE guidance on health technologies that they do not cover. Even if technologies mandated centrally by the NHS via National Service Frameworks and NICE guidance are taken up accordingly, this may lead to the neglect of other technologies, no matter how potentially beneficial, simply because they have not yet been reviewed centrally. Our interviews with PCT prescribing leads, reported below, confirm that crowding out of technologies not yet centrally mandated is indeed an issue.

3. Mechanism of NHS Resource Flows

3.1 Introduction

Tracing the flow of resources through the NHS in England is not a straightforward task. The Department of Health's annual reports on its expenditure plans represent an important source (Department of Health 2001a, 2002a), but a full understanding requires information to be added from, and cross-checked with, several other documents. Even then there is sometimes a lack of clarity in published sources about how the different NHS bodies interact in determining which resources flow to whom and for what purpose. No single document presents a complete picture.

The information presented in this section was initially compiled from published government documents. Our understanding of the resource flows, and of the roles of the wide range of institutions and groups potentially involved in deciding on these flows, was then checked in discussion with officials at the Department of Health, a Strategic Health Authority and a PCT.

There are numerous different measures even of total NHS resource use or expenditure according to whether the focus is on:

- revenue and/or capital expenditures;
- cash or accruals basis and the extent to which resource accounting principles are applied;
- gross or net of patient charges, revenues from asset sales and other income sources.

Any given total can then be sub-divided in numerous alternative ways according to:

- whether the resources are subject to a cash-limit (fixed budget cap) or not;
- the type of institution spending the resources – e.g. PCT, other NHS Trust, Special Health Authority, individual practitioner;
- the type of resource to be purchased – e.g. medicines, equipment, staff;
- the health care programme on which the resources are supposed to be spent – hospital and community health services, family health services, central health and miscellaneous services;
- or the disease area to which resources are to be directed to – e.g. cancer, coronary heart disease, mental health, HIV/AIDS.

Individual spending analyses, tables and figures within the latest annual expenditure plan report are sometimes not directly comparable one with another without adjustment. They are also often not directly comparable with apparently similar

tables and figures in the preceding year's expenditure plans report. When bringing in information from other Department of Health or NHS documents in order to provide more background and detail, these comparability problems multiply.

For the purposes of this section of the study, we have analysed the flow of revenue resources (i.e. excluding those resources earmarked for capital expenditure) through the NHS in the financial year 2002/03. Capital is excluded in order to simplify the exposition considerably; to avoid possible double counting where revenue cost figures include an element of capital charges; and because the focus of the study is on uptake of new health technologies in primary care, where aggregate capital expenditure other than on buildings is very small relative to total NHS resource use.

As set out in the government 'White Paper' *Shifting the Balance of Power: Securing Delivery* (Department of Health 2001b), PCTs are replacing Health Authorities (HAs) as the purchasers of primary and secondary health care in the NHS in England. Strictly this requires the passage of legislation and so, formally, is only in place from 1st April 2003. However, from 1st April 2002 the purchasing ('commissioning' in NHS terminology) functions of the old HAs effectively passed to PCTs. The HAs existed in little more than name in 2002/03. Hence in the remainder of this report, the discussion of resource flows in 2002/03 is in terms of the de facto state of affairs, with PCTs having taken over the resource allocation functions of HAs.

3.2 Budgeted Flows 2002/03

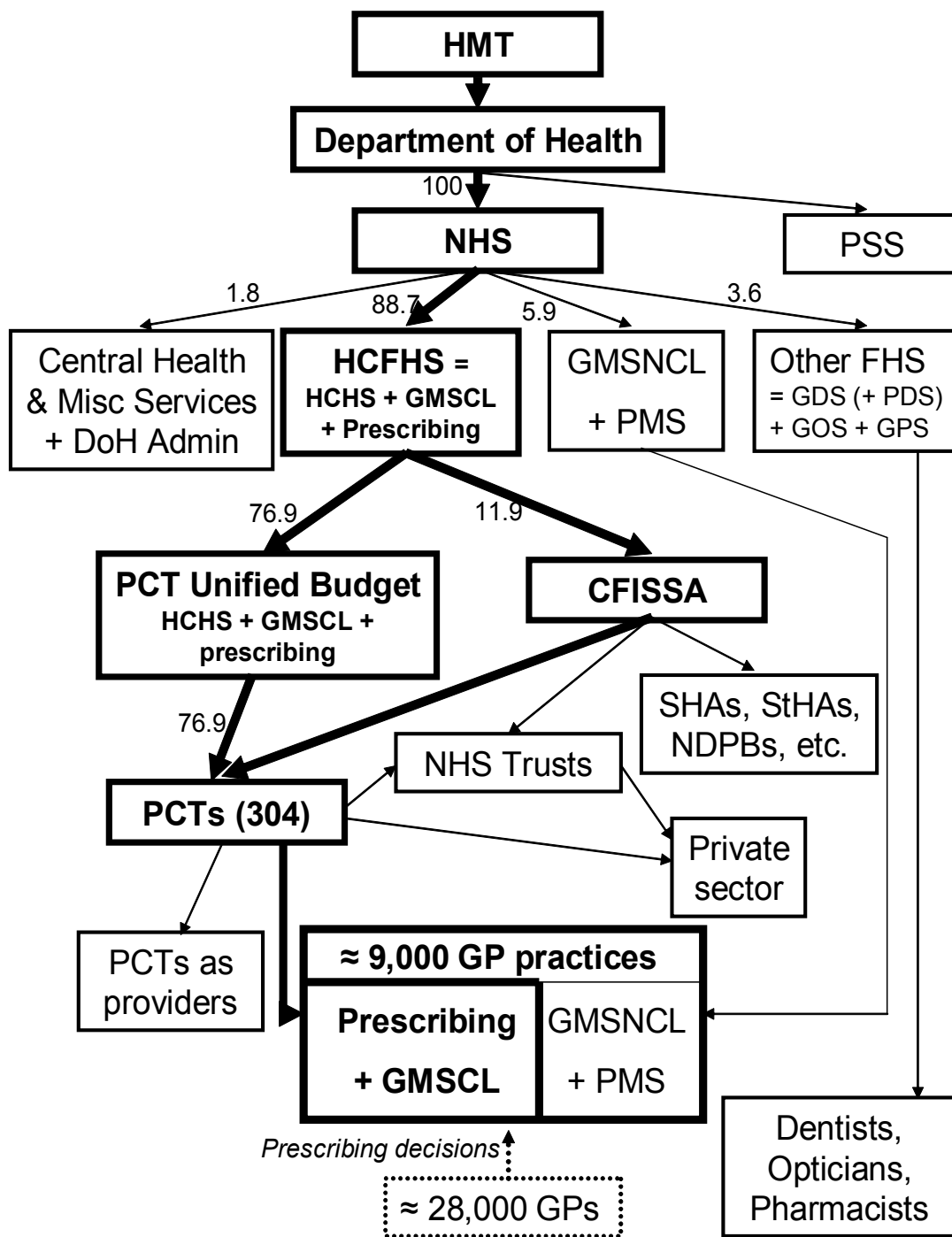
The total net English NHS resource budget for 2002/03, i.e. planned total consumption of resources, excluding capital is **£53.96 billion**. This represents a £3.66 billion (7.3%) increase on the estimated outturn for the previous year. After taking out the effect of an assumed level of general inflation of 2.5% from 2001/02 to 2002/03, this equates to a 4.7% real increase in net NHS 'revenue' expenditure⁶.

Figure 3.1 summarises the flow of English NHS resources in 2002/03. Given our focus on primary care expenditure on new medicines and other new health technologies, Figure 3.1 highlights in bold font the path of resources which may be drawn on for those purposes, among others. Concentrating on this flow, the following paragraphs explain the individual stages. As well as being complicated, the flow of resources through the NHS is subject to frequent institutional change. For example when the new General Medical Services (GMS) contract is implemented in full in April 2004 this will mean that for the first time GPs' incomes along with all other GMS expenditures will be paid out of nationally cash limited budgets (NHS Confederation and BMA 2003).

⁶ The sums in this paragraph are all based on the detailed table in Annex 2 of Department of Health (2002a). The real growth figure implied in that table is smaller than the net real NHS expenditure growth figure of 6.1% shown in Figure 3.4 of Department of Health (2002a) because the latter has been compiled on a different accounting basis and includes capital expenditure, which is planned to grow much faster than revenue expenditure.

Figure 3.1: English NHS Revenue Resources – Flow of Funds 2002/03

(Net of prescription and other charges)



Sources: Department of Health 2002a, 2001c,d; Prescribing Support Unit 2002; authors' personal communications with Department of Health, Strategic Health Authority and Primary Care Trust officials.

The Department of Health is voted funds by Parliament for expenditure on the NHS and also, a much smaller amount, on non-NHS personal social services (PSS). The Treasury (HMT) is responsible for passing these funds to the Department. For every £100 the Department was due to receive in the 2002/03 financial year for 'revenue' (i.e. non-capital) expenditure on the NHS, Figure 3.1 shows how it was divided up. The large majority was allocated by the Department of Health for expenditure on Hospital, Community and Family Health Services (HCFHS), but small percentages went to other purposes as summarised in the following paragraphs.

Central Health and Miscellaneous Services plus Department of Health Administration Costs

Central Health and Miscellaneous Services (CHMS) plus the costs of running the Department of Health itself take 1.8% of resources. CHMS cover a disparate range of activities that receive funds directly from the Department rather than via Health Authorities, PCTs or NHS Trusts. They include: paying for medical treatment received by UK nationals in other European Economic Area member states, the Public Health Laboratory Service, grants to voluntary organisations, and many other activities.

General Medical Services Non-cash-limited, plus Personal Medical Services

Remuneration of GPs, unlike most NHS expenditure, in 2002/03 was not subject to an overall cash limit, i.e. it was not constrained to remain within a fixed overall budget (although this will change in 2004/05 with the new GMS contract). In 2002/03 approximately 80% of GPs are remunerated for their NHS work under the terms of the nationally negotiated GP contract. These funds are labelled General Medical Services Non-cash-limited (GMSNCL) and are effectively paid directly by the Department of Health to individual GPs. They do not form part of a PCT's budget.

Approximately 20% of GPs in 2002/03 had opted to join 'personal medical services (PMS)' schemes. They are paid on a different, locally negotiated, basis from the GP contract. The funds for PMS payments, which may include purchasing services in addition to GPs' remuneration, still effectively pass directly from the Department of Health to the individual GPs. PCTs have no discretion to allocate these funds for other purposes.

Taken together, GMSNCL and PMS account for 5.9% of the NHS revenue resources budget in 2002/03.

Other Family Health Services

The 'other Family Health Services (FHS)' heading covers the other non-cash-limited areas of the NHS budget, amounting to 3.6% of the total net NHS revenue resource budget. It includes payments to community (i.e. non-hospital) based dentists, opticians and pharmacists contracted to the NHS. Formally this is labelled as the costs of the General Dental Services (GDS), General Ophthalmic Services (GOS) and General Pharmaceutical Services (GPS). GPS expenditure excludes the costs of medicines dispensed. A small number of community based dentists have opted for

locally negotiated ‘personal dental services (PDS)’ contracts rather than the national GDS contract.

These ‘other FHS’ funds are effectively paid directly by the Department of Health to the individual practitioners contracted to the NHS – dentists, opticians and pharmacists. PCTs cannot allocate these funds to other purposes.

Hospital, Community and Family Health Services

By far the largest share of NHS resources, 88.7%, goes to provide the cash-limited budget of the Hospital, Community and Family Health Services (HCFHS). This pays for:

- all secondary and tertiary health care services provided by the NHS, plus ambulance services and community health care (community nursing etc.) services. Taken together these are referred to as the Hospital and Community Health Services (HCHS);
- the cash-limited, otherwise referred to as ‘discretionary’, part of General Medical Services (GMSCL) expenditure. This covers GP practice costs apart from the remuneration of the GPs themselves, which comes under GMSNCL as explained above; and
- the costs of medicines prescribed by GPs, and others⁷, in the community.

The large majority of the total HCFHS funds are passed by the Department of Health to PCTs in their ‘unified budgets’. The 304 PCTs are each responsible for commissioning the majority of NHS services required by a local population. The average PCT’s resident population size is around 165,000. The principle of the unified budget is that individual PCTs can decide precisely what mix of services, from which range of providers, they wish to commission for their local population. This discretion extends to the balance between primary and secondary care expenditure and, within primary care, how much is allocated to medicines prescribing and the purchase of other health care technologies.

The unified budget, combining prescribing with HCHS expenditure, was introduced in 1999/2000. Prior to April 1999, community prescribing costs were not cash limited. The government’s purpose in including them in a single budget with HCHS activities (GMSCL was added later) was both to increase the degree of predictability of, and control over, the total NHS budget, and to remove a possible distortion of treatment choices. With a unified HCHS plus prescribing budget, a PCT (or, in the past, a Health Authority) is in principle free to switch funds either way between prescribing and other forms of health care. Previously such switching was not possible.

⁷ At the time of writing, in June 2003, ‘others’ refers to dentists and to the proportion of community nurses who, following specific training, are entitled to prescribe from a limited formulary. Current government policy is to extend prescribing rights to more community nurses and to pharmacists. The share of the total community prescribing bill resulting from these non-GP prescribers is currently negligibly small.

As shown in Figure 3.1, of each £100 provided by the Treasury to the Department of Health to fund the NHS, on average £88.70 was allocated in 2002/03 to the HCFHS. Of this amount, £76.90 went into PCT unified budgets. The remaining £11.90 has gone to resource ‘Centrally Funded Initiatives and Services and Special Allocations (CFISSA)’. The balance between CFISSA and PCT unified budgets is decided by Ministers and depends on their policy objectives. CFISSA cover a very wide range of activities, purposes and individual projects, and in total were allocated £6.40 billion of revenue resources in 2002/03, compared with £41.47 billion allocated to the PCTs’ unified budgets. A wide range of NHS bodies, and some outside the NHS, are in receipt of CFISSA money. By far the largest proportion of CFISSA money goes from the Department of Health to NHS Trusts, but PCTs, Special Health Authorities, Strategic Health Authorities, other NHS and non-NHS non-departmental public bodies (NDPBs) and voluntary organisations all receive some.

More than half of CFISSA spending (£3.46 billion out of the £6.40 billion total CFISSA budget in 2002/03) is taken up by allocations straight to NHS Trusts for ‘multi-professional education and training’ and to pay for the additional costs incurred by NHS organisations undertaking research and development (R&D)⁸. But the destination of elements of the remaining £2.94 billion has become controversial, at least within NHS circles.

Those resources are, in principle, ring-fenced. Any funds channelled by the Department of Health to an NHS body as part of a centrally funded initiative are supposed to be spent on the named purpose and no other. However, not all ring-fenced funds are being spent on the ends for which the Department of Health intended them. For example, funds intended by the Department to be spent on information technology may end up paying part of the NHS wages bill. The Audit Commission (2003b) found that in half of PCTs and mental health trusts, and in more than one third of acute trusts, the Commission’s auditors were not satisfied that “adequate arrangements were in place to ensure that growth monies were used for their intended purposes”.

Some cancer clinicians are reporting that they have seen little increase in their funding despite budgets being ring-fenced for that purpose. The NHS’s national cancer director, Professor Mike Richards, told the House of Commons Science and Technology Select Committee that not all of the ‘hypothecated’ £255 million promised in the 2001 NHS cancer plan (and which includes substantial CFISSA funds) had got through to cancer services (Science and Technology Committee 2002, question 23). Concern about the possible diversion of funds for cancer care being diverted to other uses presumably lay behind the Secretary of State for Health’s instruction in January 2003 to chief executives of Strategic Health Authorities to track where the cancer money has been spent. The report of this investigation by the Department of Health, published in May 2003 (Department of Health 2003d), concluded that £199 million (71%) out of £280 million intended to be spent in 2001/02 on implementing the NHS Cancer Plan in England had actually been spent on that purpose, implying that £81 million had been siphoned off for other purposes.

⁸ Figures in this paragraph have been calculated from Department of Health 2002a, p.57, Figure 6.6.

By 2002/03 actual expenditure on the Cancer Plan (£406 million) was reported to be practically the same as that intended by the Department (£407 million).

Scrutiny of the detailed breakdown of planned CFISSA spending in 2002/03 (Department of Health 2001c⁹) implies that at least £198 million, and perhaps as much as £844 million, of 2002/03 CFISSA money was passed to PCTs. The ring-fenced purposes to which these funds are put include:

- booked admissions schemes in local hospitals;
- drug misuse prevention services;
- cancer projects;
- screening programmes;
- prison in-reach services; and many others.

In its Health Service Circular announcing the revenue resource allocations for 2002/03, the Department of Health stated that such ring-fenced allocations to Health Authorities (and hence to PCTs) are made “with the intention that they are spent on the purpose for which they were allocated” (Department of Health 2001e). Some or all of the ring-fenced sums are presumably being spent on the purpose for which the Department of Health intended them. Detailed audit of whether and how much that is the case would be costly and probably impractical to administer for all CFISSA spending, given the large number of individual activities and the even larger number of organisations involved. The Department checks on outputs – are waiting lists being reduced, are booked admissions systems in place – but as far as we are aware does not usually check whether CFISSA funds allocated for a specified purpose were indeed all spent to that end. The cancer money tracking exercise described above is exceptional.

It is therefore possible for PCTs and other recipients of CFISSA funds to direct them to other purposes which they consider to be higher priorities. Thus, although the unified budget allocation provides the large majority of a PCT’s discretionary resources, CFISSA may provide some more.

3.3 Allocating Resources to Primary Care

This section assesses how resources reach primary care for purposes other than the remuneration of primary care practitioners – GPs, dentists, opticians and pharmacists – as none of the funds for remuneration are available for purchase of medicines or other primary health care technologies. As explained in the previous section, most discretionary expenditure on primary care in 2002/03 was funded out of the £41.47

⁹ Table 3.7 of that December 2001 Department of Health source provides a line by line breakdown of intended CFISSA funded activities but they total £6.01 billion, somewhat less than the £6.40 billion that was, in the event, allocated to CFISSA for 2002/03.

billion allocated to PCTs 'unified budgets', although some millions more pounds may possibly have been siphoned off from CFISSA allocations.

The Department of Health's determination of each PCT's unified revenue budget depends on two facts and one judgement, respectively:

- the 'weighted capitation formula', which determines each PCT's target share of total resources allocated to all PCT unified budgets taken together;
- the baseline, namely what share of total resources the PCT (or its shadow organisation if the PCT did not already exist) was awarded last year; and
- the 'pace of change' that the Secretary of State for Health deems appropriate – after taking advice from his senior officials and NHS managers – in moving each PCT from its historic actual level to its target level of funding.

The weighted capitation formula is the tool of the government's policy of improving geographical equity of access to NHS services. The formula represents an attempt to determine each PCT's (previously each Health Authority's) share of total discretionary NHS revenue resources according to a measure of need for health care as proxied by the size, age and sex structure and socio-economic characteristics of its resident population, adjusted for relative costs of providing health care in that area compared with the average for England as a whole (so-called 'market forces factors'). A formula of this kind has been in existence since 1976. The detailed structure, parameters and coefficients of the formula have been changed several times over the intervening period, and indeed have been changed again for the purposes of determining the 2003/04 revenue resource allocation targets. These latest changes are intended to add more refined measures of socioeconomic deprivation; to take better account of different levels of hitherto unmet need in different areas; and to improve the staff cost market forces factor take better account of geographical variations (Department of Health 2002c,d).

The weighted capitation formula for 2002/03 revenue resource allocations to Health Authorities and hence PCTs consisted of four separate formulae, one for each of the following categories of expenditure (Department of Health 2001c); the four formulae were then combined using the weights below to compile an overall resource allocation target:

- HCHS, 81.46%;
- prescribing, 15.00%;
- GMSCL, 2.66%;
- HIV/AIDS and drug abuse services, 0.87%.

The weights represent the actual shares of total expenditure in the latest year for which outturn data were available when the resource allocations were made. This

meant that the 2002/03 allocation weights were the outturn shares of expenditure taken by HCHS, prescribing, etc. in 1999/2000. Thus the allocation formula adjusts allocations to observed trends in outturn expenditures with a lag of about three years. Calculating the combined weighted allocation formula for each PCT then enables each PCT's share of the national total of resources to be calculated. Applying that target share to the total of resources made available by Parliament then gives the target amount of funding for each PCT. The amount of funding received by the PCT in the previous year is the baseline and the gap between the two is the 'distance from target'. Any PCT may be either under or over target¹⁰.

The speed with which each PCT's actual allocations year by year are brought into line with the target, i.e. the pace of change, is then determined by the Secretary of State, subject to two vague criteria:

- avoiding disruption: "to maintain continuity and stability in the service and make progress nationally in priority areas";
- while moving "as quickly as practical to fair shares";

(both quotes are from Department of Health 2001e, p.2.7). This means in practice that no PCT has funds taken away from them because they are over target. Indeed in the 2003/04 PCT allocations which were announced in December 2002, all PCTs are to receive significant percentage increases in their unified budgets. The government's policy of improving geographical equity in funding of PCTs is pursued gradually via a process of levelling up: the PCTs below target are given greater percentage funding increases than the PCTs that are at or above target.

Although the formula used to derive PCTs' revenue allocations in 2002/03 was calculated using a weight of 15.00% for prescribing and 2.66% for cash limited GMS spend, individual PCTs are free to determine how to allocate their total unified budget as they wish. History and inertia will have a strong role: it is difficult to make large changes from one year to the next in the quantity of resources allocated to different purposes, particularly if an NHS organisation or unit or group of staff or patient group considers itself to have been adversely affected. So the percentage allocation of resources by a PCT to primary care and to prescribing or GMSCL within that this year is likely to resemble the allocation last year.

Within the broad resource allocations, a PCT decides between commissioning services from NHS Trusts and other secondary care providers and spending money on primary care. PCTs are responsible for setting prescribing and other budgets for the GP practices in their area. The Department of Health directs PCTs to base practice prescribing budgets "... on a mix of weighted capitation methodology, historic spending patterns and local judgement" (Department of Health 2001d, paragraph 20). The general advice given by the Department to PCTs in determining prescribing budgets for GP practices is to start with the 'prescribing' part of the formula used in

¹⁰ A clear, detailed, and therefore lengthy, exposition of how the weighted allocation formula is calculated for a Health Authority (the method being exactly the same for a PCT) is set out in Department of Health 1999.

determining PCTs' target unified budgets, but to use this only for around 50% and to set the remainder of the budget based on local knowledge.

As an example, Torbay PCT has published on the internet a document explaining how it set its GP prescribing budget allocations for 2001/02 (Torbay PCT 2001). Its general approach was to consider separately what it referred to as "high cost medicines", which were listed and were expected to amount to 7% of total prescribing expenditure across the whole PCT. Because of the variability and large consequent impact of spend on high cost medicines on any one practice's prescribing budget in any one year, funding for these medicines was effectively held centrally by the PCT. This approach of creating a contingency fund for high cost medicines shields GP practices' prescribing budgets from the risk of large random variations, which in turn increases the likelihood that GPs will take these budgets, and any related prescribing incentive schemes, more seriously. Given the attractiveness of this to PCTs it is likely to be a common feature of resource allocation mechanisms for practice prescribing budgets.

Budgets for the other 93% of expected prescribing expenditure, on so-called "core medicines", were delegated to individual GP practices however. Each practice's "fair share budget" was calculated using a formula similar to the prescribing element of the national resource allocation formula. The "fair share" budget for the next year (2001/02) was then compared with the baseline, namely the practice's core medicines prescribing budget for the then current year (2000/01). Practice budgets were then increased or decreased by one third of the difference between the "fair share" and baseline budget depending on whether the baseline was below or above the "fair share".

Two reasons why allocations of resources between different areas of NHS services might be expected to be changing are National Service Frameworks and the guidance produced by NICE. These are introduced in the following paragraphs but are discussed further in section 5, which presents the findings from our interviews with PCT prescribing leads. National Service Frameworks and NICE guidance can identify technologies upon which NHS expenditure should be increased substantially. This inevitably has the potential to cause resource allocation problems to PCTs to the extent that such spending increases were not fully anticipated when budgets were set. However, if PCTs take the Torbay approach of giving "high cost medicines" special treatment, then this suggests that, at least in principle and for medicines, flexibility is being built into their budgets to deal with lumpy increases in prescribing bills, as long as the increases are due to greater prescribing of the medicines specified.

The ultimate decision whether, and if so what, to prescribe for a patient remains with the individual GP. Cost and the availability of funding may be factors in that decision but, as the literature review and interview findings discussed in sections 4 and 5 show, many other factors intervene and some of them appear to be stronger than financial considerations.

3.4 Changes in Allocations

We noted in section 3.2 that the total net English NHS resource budget for 2002/03 excluding capital was, at £53.96 billion, up £3.66 billion or 7.3% on the estimated £50.30 billion outturn for the previous year. Within this, and partly because of the inclusion of slightly more activity within the unified budgets, total resources for PCT unified budgets (formally Health Authority unified budgets) went up £4.25 billion, or 11.4%, from £37.22 billion in 2001/02 to £41.47 billion in 2002/03. Thus the total pot of money from which primary care prescribing and other discretionary expenditure is drawn increased rather more rapidly between 2001/02 and 2002/03 than did NHS resources in total (Department of Health 2001a, 2002a).

No national totals are available of individual GP practices' budgets for prescribing or for purchasing any other type of health care technology. Outturn primary care expenditures in these areas will only be known after the end of the financial year. So it is not possible to say at this stage how much of the extra resources going into PCTs' unified budgets are being allocated to medicines and other technologies, let alone the amounts being spent specifically on new technologies.

English Health Authorities' unified budget allocations (excluding capital) rose in total by 8.9% in 2001/02 from 2000/01 (Department of Health 2001a, Figure 5.5). Over the same period, the net ingredient cost of prescriptions in the community increased by 11.2% (source: Prescription Pricing Authority PD1 monthly returns). Thus, prescribing took a slightly greater share of the unified budget allocation in 2001/02 than in 2000/01. The Department of Health estimates (Department of Health 2003b) that primary care prescribing costs have increased 11.5% in 2002/03, which compares with the aggregate 11.4% increase in PCT unified budgets noted above. Thus in 2002/03 there appears to have been almost no change in prescribing's share of the PCT unified budget allocation.

4. Factors Affecting Uptake of New Technologies in Primary Health Care

4.1 Background

The analysis in the preceding section of the way in which NHS resources are allocated between alternative budgets, demonstrates the scope for discretion by health service managers and clinicians. Further, given those budgets, it is ultimately the actions of the clinicians that determine how the money is spent, including whether to override budgets.

To investigate the factors that influence those actions in primary care, with specific reference to decisions about use of new technologies, we undertook a literature review of existing published research relevant to the UK. We then added fresh evidence from a programme of interviews which we conducted in January and February 2003 with GPs acting as prescribing leads for their local PCTs. The main purpose of the interviews was to obtain informed views from practising GPs of how the additional NHS funding is likely to be spent (discussed in section 5 below). But at the same time they also provided more general information on the factors influencing those spending decisions.

The findings of the literature review are set out in full in Appendix 1 of this report. The literature we found confirmed that the rate of uptake of new medicines in the UK is slow relative to other Northern European countries and the US [46,47]. (Numbered references in square brackets can all be found in Annex 1.1 to Appendix 1: ‘References found in the literature review’.) In the case of new non-medicine technologies there is also evidence that diffusion rates in the UK lag behind those of other countries [30].

Determinants of the rate of uptake of new technologies in primary health care are intrinsically difficult to identify. There are essentially two types of approach that can be adopted: qualitative and quantitative. Both types are found in the literature.

The qualitative approach is to ask clinicians why they acted as they did; the quantitative approach is to analyse observed data to see if patterns and trends can be identified. The problem with the qualitative approach is that involves self-reported data, which are prone to a number of potential biases.

The limitation of quantitative data analysis is that, even if associations can be identified, they do not establish causality. Quantitative analysis cannot explain the direction of influence, or how the influence is operating, or whether another, unmeasured, factor is having an effect. In addition, quantitative studies typically manage to explain only a small proportion of the observed variation in the dependent variable (e.g. rate of uptake of a new technology).

A few studies used both qualitative and quantitative approaches to attempt to compensate for these respective shortcomings.

We have used a conceptual framework that identifies:

- the actors in the process;
- the structure or environment in which diffusion occurs; and
- the characteristics of the individual innovations;

as the three key sets of factors influencing the diffusion of health care technology, to enable us to identify some clear patterns from the literature review.

4.2 People

The key groups of actors influencing the take-up of new primary health care technologies are:

- GPs;
- hospital consultants;
- the media;
- patients;
- the pharmaceutical industry;
- policy makers;
- prescribing advisers;
- professional bodies / networks / partners.

The uptake of new technologies in primary care is not a straightforward cumulative process. It contains numerous interactions and feedback loops. But at the centre of the process is the doctor-patient relationship. This may often be a long-term relationship and, by definition, GPs are generalists who adopt a more holistic approach towards the patient, seeing them (and often their relatives) through a range of illnesses. GPs are reluctant to take on new roles, where these are perceived to be the domain of the specialist [32].

Four studies found that new medicines are tried out with caution on small number of patients and the effect on these patients is monitored carefully before they are used more widely [15,23,25,27]. The experience of a dramatic clinical event could also trigger a change in prescribing [23,27]. It appears that more importance is attached by the GP to feedback from their own patients than is given to scientific evidence involving large numbers of other doctors' patients:

“It doesn't really matter one bit what happens with other people, it matters what happens with your patients, if your patients are feeling better on a drug

and not having side effects of a drug, it really doesn't matter what the journals say" (quoted in Prosser et al. [25]).

One study [26] assessed how innovative GPs were in their practice and concluded that most were cautious. However, those GPs who were particularly innovative had a positive impact on their partners' prescribing. Another study [27] involved interviews of high, medium and low prescribers. All respondents described themselves as cautious and conservative in their prescribing behaviour but a few high prescribers, GPs with particular expertise in a specific clinical area, appeared more confident to try out new drugs.

Perhaps surprisingly, no significant association has been reported in the literature between the age of the GP and the rate of uptake of new technologies. Older GPs are not reported in the literature as being less likely to use new technologies than are their more recently trained peers.

Many studies in the literature comment on the influence of the patient on the GP's prescribing decisions. One study found that patients sometimes declined the GP's offer to switch their medication to a more evidence based alternative [24]. Patient demand for new technologies could also sometimes influence the GP [19,31] and patient groups were found in one study [11] to exert influence, particularly over prescribing of new medicines for rare conditions. However, none of the 20 GPs we interviewed (see Appendix 2) mentioned patients when invited to list the factors affecting decisions on whether to introduce new technologies in primary care.

Beyond the doctor-patient relationship are a number of other players who influence the GP's decision to adopt new technologies. Hospital consultants – although not all are granted equal status by GPs – were most commonly cited as important sources of information, and secondary care led prescribing is common. A substantial minority, 6/20, of the GPs we interviewed explicitly mentioned secondary care as a source of influence on their decisions. (As our interview approach involved asking open questions - such as "what were the main influences?" – the fact that only six respondents chose to mention one factor cannot be taken to mean that the other 14 considered it unimportant.)

GPs' professional partners and peers may also be influential, although apparently more in the direction of encouraging restraint than in encouraging uptake of new technologies [27]. However, only 2/20 of our interviewees mentioned other GPs as the main influence on expenditure on a new technology.

In the arena of medicines, one study in the literature found that the influence of pharmaceutical company sales representatives was the most important source of information about medicines for one-third of GPs and a key influence in a GP's ultimate decision to prescribe in 40% of cases [25].

Among the PCT prescribing lead GPs we interviewed, several (7/20) mentioned their local PCT or its predecessor HA as having influenced new or increased expenditure on particular primary health care technologies. Evidence from the literature review focused mainly on the role of prescribing advisers employed by Health Authorities

and PCTs, and was mixed. Four studies in the literature concluded that prescribing advisers did influence GPs [15,19,24,27] but two did not detect such influence [16,17]. However, these studies were, with one exception, carried out in the days of HAs rather than PCTs. HA prescribing advisers had less involvement at practice level than PCT prescribing advisers do now. Interviews with four PCT prescribing advisers and six HA advisers were included in one study, but findings were not reported separately [19].

The power of central NHS mandate to stimulate uptake of some primary care technologies, particularly medicines, was reported to be strong according to the large majority of the PCT prescribing leads we interviewed. This is discussed in section 4.3 below. The interviewees were referring to National Service Frameworks and NICE guidance, compliance with which is currently a top priority in the NHS backed up by inspection and performance rating in the first case and legal requirement in the second. Where central policies are less forcefully backed-up, the power of policy makers to impose new technologies was shown to be weak in two studies [33,38] concerning telemedicine and integrated NHS-wide information systems respectively.

In the non-medicines arena, the introduction of new technologies often needs to be managed; structural issues are therefore more important than individual actors.

4.3 Other Factors

Most studies in our literature review pre-date the creation since 1999 of Primary Care Trusts, National Service Frameworks and NICE, and the inclusion of GP prescribing within a cash-limited PCT budget. All of these things may have important impacts on the diffusion of technologies in primary care, but the nature and scale of these impacts has not yet been demonstrated in published research.

For example, we found little evidence in the published literature that HAs (forerunners of PCTs as NHS commissioners of health care) had influenced the uptake of new medicines [17] and found that health care purchasers had had little success in achieving change through contracts at the level of secondary care [13,42]. Locally commissioned appraisals of technologies (in the form of the NHS South and West region's Development and Evaluation Committee reports) also appear to have failed to effect change [36]. However, as already noted, several of the PCT prescribing leads we interviewed in January and February 2003 cited the local PCT or its predecessor HA as having a significant influence. It is unclear how far this reflects the fact that our interviewees, although practising GPs, also 'wear a PCT hat', having taken on a role for the PCT as the lead GP representing their colleagues on prescribing issues locally. The fact that they volunteered to take on that role may mean that they are more inclined than other GPs on average to attribute influence to the PCT.

Our literature review findings suggest that scientific papers do not represent one of the more important influences on decision making in primary care, but it is possible that this may change as the organisational culture of the NHS is modernised [29,50].

One of the remits for NICE is to promote interventions with good evidence of clinical and cost-effectiveness “so that patients have faster access to treatments known to work” [48]. The House of Commons Health Committee report on NICE in 2002 did not directly assess the extent of the Institute’s success in achieving this aim, but did acknowledge the concern of ‘NICE blight’ [49]. This is said to occur when the NICE appraisal process slows the uptake of new technologies, as commissioners and clinicians adopt a ‘wait and see’ attitude, pending the appraisal’s outcome. ‘NICE blight’ may also affect new technologies that are not on NICE’s list to be appraised, because if they are eventually appraised then commissioners and clinicians will want to wait for the outcome, and if they are not appraised they can be ignored with relative impunity as there will be no official pressure to use them.

The MANMED survey in 2001 found that primary care organisations appeared to be active in pursuing a wide range of prescribing initiatives, for which nationally set targets were the main driver [60]. The same survey found that prescribing incentive schemes set up by PCTs for the GP practices in their area similarly refer to medicines identified in central NHS guidance.

It might be expected that a reason for low rates of uptake of new technologies in primary health care might be lack of funds, i.e. the existence of a binding budget constraint. But our literature review uncovered little support for this in primary care. While financial constraints were an overarching influence in the secondary care studies reviewed, budgetary issues rarely featured in the studies of primary care. Cost was cited as an influence, but this was generally secondary to other considerations, such as effectiveness and tolerability, except where therapeutic equivalence was perceived to exist. There was some evidence to suggest that prescribers and non-prescribers of new medicines had different attitudes to the importance of costs [27] or financial constraints more generally [17]. The propensity to prescribe new drugs has been found to be a significant predictor of high prescribing costs [51].

In contrast, three quarters of the PCT prescribing leads we interviewed in early 2003, said that even with increased NHS funding they still had insufficient to permit investment in local initiatives. All of the available funding was being taken up in satisfying centrally mandated expenditures, complying with National Service Frameworks and NICE guidance.

Findings from the literature review relate to studies that predate the inclusion of GP prescribing within cash limited NHS budgets. Prior to April 1999 GP prescribing was not cash limited. But since then, higher than expected prescribing expenditure has to be offset by lower local expenditure on other areas of NHS care, especially secondary care. The pressure to keep prescribing expenditure within budget may therefore have increased since 1999, but it is too early for studies to measure that effect.

The large cost of complying with National Service Frameworks has, since 1999, put great pressure on NHS budgets. Furthermore, since January 2002 it has been mandatory for PCTs to make available the funding required to implement NICE recommendations. This obligation may distort local priorities and divert funds from core services if they have not been the subject of NICE guidance, even from those for which there is a good evidence base of clinical and cost-effectiveness. (See for

example evidence given to the House of Commons Health Committee during its recent investigation of NICE [49, para. 78]). The cost to the NHS in England and Wales of fully implementing the first 50 NICE appraisals (net of any cost savings) has been estimated at £572-579 million per year [52] and this takes no account of the additional non-medicine costs of implementing the recommendations in clinical practice.

The potential for central NHS direction backed by financial incentives to drive the uptake of particular technologies in primary care was identified by the findings of our follow-up interviews in May 2003 with GPs acting as PCT prescribing leads. Although it was then unclear whether the new national GMS contract would be implemented, we asked these GPs for their views on the effect that the contract might have on uptake of new technologies if it were to be implemented. Nearly all of the respondents (15/17, see Appendix 2) considered that the financial rewards in the contract for GP practices which hit quantified ‘quality framework’ targets would lead GPs to focus on the technologies needed to achieve those targets. Twelve of the 17 respondents considered that non-targeted technologies, including new technologies, would be likely to receive less attention than those specified in the contract.

As the new GMS contract specifies well-established rather than particularly new technologies, it implies at best no incentive for greater uptake of new technologies and quite possibly a weakening of such incentives. This adverse effect could only be avoided if there were to be an effective, rapid and continuous process for including cost-effective new technologies among those specified in the contract. Sadly, the GMS contract lacks a process with those characteristics, containing only the following vague statement:

“An independent UK-wide expert group will oversee the process. The group will consider the latest evidence available and make recommendations to the four Health Departments or their agents and the GPC¹¹. It will be the responsibility of the negotiating parties to negotiate any changes to the quality framework, including pricing changes.” (NHS Confederation and BMA 2003, para. 3.41)

The membership of this group, how it will work, how rapidly, based on whose selection of technologies, using what evidence, commanding what resources and with what relationship to NICE are all unclear.

¹¹ The General Practitioners Committee of the British Medical Association, i.e. the organisation representing GPs as a profession in the negotiation of the GMS contract.

5. Spending the Extra NHS Resources in Primary Care: Theory and Practice

We have so far seen the mechanisms by which money flows through the NHS to the point where it is spent on providing primary health care; and reviewed the influences which are known to affect how primary health care professionals, in particular GPs, effectively decide what to spend money on. So much for the theory. In our programme of interviews, which is described in full in Appendix 2 of this report, we have sought the views of 20 practising GPs, who have each taken on a PCT-wide role as a PCT prescribing lead, on how the extra funding is being spent in primary care in practice.

Our interview survey was not intended to permit definitive statistical analysis, which would have necessitated a much larger sample and greater reliance on closed, 'tick box' style, questioning. Rather, we sought a qualitative understanding of major issues and perceptions from people who are not only actively practising GPs but also have a PCT-wide perspective. The interviews were clearly structured, and interviewees were provided with the questions in advance, but they were then given the freedom to raise the issues that they wished and to express them in their own way. This implies a need for caution when interpreting the findings – the fact that only five respondents mention an issue, does not necessarily mean that the other 15 consider it wholly unimportant. With that caveat in mind, our interview findings suggest the following about what is actually happening to additional NHS resources in primary care.

The main message from our interviews is that centrally determined requirements as expressed by National Service Frameworks and NICE guidance are absorbing much, and in many cases all, of the additional funding in primary care. Whether the extra money is permitting full compliance with these central requirements is unclear. But 18/20 of the PCT prescribing leads we interviewed considered that there is broad compliance in their PCT with National Service Frameworks. The position of the other two interviewees is unclear.

NICE guidance was mentioned by 16/20 interviewees as being a driver of new or increased primary care spending. This is as expected. Making funds available to implement NICE guidance is now mandatory for PCTs; and the majority of the NICE guidance so far published has implied a need for more, rather than less, expenditure on the technologies appraised.

Increased spending on medicines specified in National Service Frameworks and NICE guidance is doubtless a major cause of the overspending of PCT prescribing budgets that was reported by 11/20 interviewees. Just one respondent said that their PCT would underspend its prescribing budget in 2002/03. The position of the other eight interviewees is not known.

Perhaps understandably, given the dominant role played in the past by the secondary care sector in the NHS, 14 of our 20 primary care based interviewees identified secondary care as the destination for much of the extra money going into the NHS. Six of those 14 interviewees specifically mentioned the need to pay off debts that had been accumulated in the secondary care sector. To that extent there may be some hope that future increases in NHS expenditure may go proportionally less to

secondary and more to primary care than in the past because the debts of secondary care will by then have been paid off.

The primary care technologies mentioned by at least half of respondents as being the subjects of notable increases in expenditure were:

- statins, mentioned by 18/20 interviewees, as required by the coronary heart disease National Service Framework;
- atypical anti-psychotic medicines, mentioned by 11/20, as required by NICE appraisal guidance; and
- various types of IT, mentioned by 10/20.

Thus, it appears from our interviews that while the extra money so far put into the NHS has been very welcome, little or none of it has been available for discretionary development of new services by GPs or for introduction of new primary care medicines, unless mandated by NICE guidance or National Service Frameworks. Insufficient funding was the predominant reason offered by our interviewees (15/20 of them) for low or slow uptake of new primary care technologies by PCTs.

The British Medical Association (BMA) takes the same view as our interviewees. The Chairman of the BMA, speaking to the BMA Junior Members Forum on 13th April 2003 is quoted as saying that “what is clear is that doctors are not seeing the extra money” and that “doctors urgently needed to work with Primary Care Organisations to make decisions based on local health care needs” (reported in *The Times*, 14th April 2003, page 13, “Extra cash has not helped NHS, say 80% of doctors”).

Over the next few years a continuing stream of further central mandates is to be expected. The existing National Service Frameworks, particularly those most recently published – diabetes, children’s services – will increasingly be implemented. New NICE guidance will continue to be produced, although there is likely to be greater emphasis in future on production of clinical guidelines rather than appraisals of individual technologies. This may mean that in future a greater proportion of NICE guidance than hitherto may imply reductions rather than increases in NHS expenditure. This would also arise if a greater portion of NICE’s time and resources than hitherto were to be directed towards appraising older technologies currently absorbing large amounts of NHS expenditure, rather than new technologies with currently low levels of expenditure on them. But it is unclear whether this will happen, despite the recommendation of the House of Commons Health Committee (Health Committee 2002) and of the Wanless Report (2002, para. 6.11) that it should.

The trend of central specification of particular technologies to be invested in by the NHS, backed by explicit incentives for compliance, is being further reinforced by developments in the NHS performance management system. In 2003, for the first time, PCTs will be included in the ‘star rating’ system used by the Department of Health to identify the best and worst performing organisations within the NHS in

England. The performance of PCTs during 2002/03 is to be judged against nine ‘key targets’ and 37 other indicators (Commission for Health Improvement and Department of Health 2003). Only one of the ‘key targets’ (increasing the number of people who stop smoking) and one of the other indicators (prescribing of atypical anti-psychotics) imply an incentive for uptake of new primary care technologies. In addition, a few other targets imply more use of some older primary care technologies (statins, anti-hypertensives, breast and cervical cancer screening, influenza vaccination). The corollary of this is that no incentive or reward is being given to PCTs who use some of their funds on other, new health care technologies.

A proposed new national GMS contract to govern PCTs’ payments to their local GP practices was announced in February 2003 (NHS Confederation and BMA 2003) and was finally accepted by GPs on 20th June 2003, after some adjustments. A major and innovative component of this contract is the rewarding of GP practices for earning ‘quality points’ up to a possible maximum of 1,050. These will be awarded, starting in 2004/05, for achievement of a large number of different quality-related activities. Several of the activities directly or indirectly involve use of particular medicines and other technologies. These are listed in Box 5.1 (figures in brackets indicate the maximum points available for achieving that quality standard). The new contract also enables GP practices to negotiate with their local PCT to provide ‘enhanced services’, which is intended to stimulate innovative developments in primary care.

Given the major new elements being proposed, we returned in the first half of May 2003 to the 20 prescribing lead GPs we had interviewed three months earlier, to obtain their views on the impact of the new contract on uptake of new technologies in primary care should it, or something like it, be implemented. The details of this part of the interview programme are in Appendix 2.

The quality point system of the new contract gives GPs clear financial incentives to use the particular technologies specified in the quality targets. Fifteen of the 17 prescribing leads who replied thought it likely that uptake of the specified technologies would increase as a result. Most of these technologies are familiar and established. The process by which new technologies might be introduced into future years’ versions of the quality framework is unclear, but seems likely to involve substantial time lags.

Twelve of the 17 responding GPs thought that uptake of technologies not specified in the ‘quality framework’ would, as a corollary, be accorded a lower priority and possibly even be left to “lie in the doldrums”. Thus there is an important distinction between the expected impact on some existing technologies and on new technologies becoming available currently and in the future. The ‘quality points’ approach of the new GMS contract, as currently specified, does little to encourage the uptake of innovatory technologies in primary care, however cost-effective, and could even make it harder to get GPs interested in them. The Department of Health and ABPI (2002) have recently concluded, in the context of prescribing incentives, that “incentives can have perverse effects in encouraging doctors to meet specific targets to the detriment of other aspects of patient care” (page 156).

Box 5.1: Technologies Incentivised in the Proposed New GMS Contract

- reducing cholesterol levels in coronary heart disease patients (16 points out of the maximum total of 1,050);
- aspirin, anti-coagulant or anti-platelet medicines prescribed for coronary heart disease patients (7);
- treating coronary heart disease patients with beta blockers (7);
- treating myocardial infarction survivors with ACE inhibitors (7);
- flu vaccination for coronary heart disease patients (7);
- treating coronary heart disease patients with left ventricular disease with ACE inhibitors or A2 antagonists (10);
- reducing cholesterol levels in patients with transient ischaemic attacks or stroke (5);
- aspirin, anti-coagulant or anti-platelet medicines prescribed for patients with stroke shown to be non-haemorrhagic, or with a history of transient ischaemic attacks (4);
- flu vaccination for patients with transient ischaemic attacks or stroke (2);
- reducing blood pressure in patients with hypertension (56);
- retinal screening for diabetic patients (5);
- reducing blood pressure in diabetic patients (17);
- treating patients with proteinuria or micro-albuminuria with ACE inhibitors or A2 antagonists (3);
- reducing cholesterol levels in diabetic patients (6);
- flu immunisation for diabetic patients (3);
- flu immunisation for chronic obstructive pulmonary disease patients (5);
- flu immunisation for asthma patients (12).

However, it is important to note how powerful the GPs consider financial incentives to be. This implies that if financial incentives were to be linked to using cost-effective new primary health care technologies, then that would give a significant boost to their rate of uptake.

On average, the 17 GP respondents considered that the ‘enhanced services’ part of the contract could lead to increased innovation in provision of primary health care services. But in most cases, 11/17, this impact was thought likely to be uncertain or small, for example because of financial constraints on PCTs. Among the 6/17 respondents who felt there might be a more significant impact, four considered this most likely in non-medicine technologies such as diagnostic endoscopy and minor surgery. A large part of this would be moving services out of hospitals and into primary care settings.

Thus, the extent to which additional NHS funds in future years are devoted to new primary care technologies will depend heavily on the level of funding being sufficient to permit not only compliance with NSF and NICE guidance but also room for PCTs and GPs to exercise local discretion. Central mandates take priority and, in primary care, currently focus on familiar technologies. The new GMS contract is likely to reinforce that via its quality points system. The rate of uptake of other new technologies than those that have found their way into central mandates will depend first on the extent of the financial headroom that exists beyond what is required to meet those central mandates, and second on providing primary care professionals with the incentives, information and encouragement to make use of it.

6. Conclusions

The NHS received historically large real increases in its funding in 2001/02 and 2002/03, and the Government is planning further increases averaging 7.4% per annum in real terms¹² over the next five years to 2007/08. Evidence presented in the PICTF reports implies that this has not yet led to any change in the NHS's low – by international standards – propensity to use new technologies, meaning those technologies (PICTF specifically referred to medicines) that have become available in the last five years. The extra funding now being provided to the NHS provides an opportunity, which should not be lost, to increase the uptake of cost-effective new technologies.

We have traced the factors that influence how much of the extra NHS resources find their way into primary care and, in particular, into paying for new health technologies there, including innovative medicines. The flow of funds through the NHS is difficult for an outside observer to plot in detail.

Leaving aside the remuneration of GPs and other primary care practitioners, the share of NHS funding that reaches the front line of primary care is determined both by formulae and by discretion exercised at various levels from the Department of Health to the individual GP. The Secretary of State and his Department of Health civil servants determine the proportion of NHS funds that goes to hospital, community and family health services to provide the 'unified budgets' of PCTs, and the proportions that are top-sliced and allocated to various central initiatives and other purposes. The Secretary of State and Department of Health also define the formula used to identify individual PCTs' target share of the total national 'unified budget' allocation, and determine the speed with which each PCT approaches its target share, given its existing funding levels.

PCTs receive a 'unified budget' in this way, which forms the large majority of the NHS resources they allocate and manage. They also receive much smaller amounts for their part in some of the top-sliced central initiatives – and some of these funds might, in practice, be used for purposes other than that intended by the central initiative.

In principle, PCTs have the discretion to spend their unified budgets as they think fit in buying health care for their local populations, subject to meeting statutory requirements and Government performance targets. For example, although the formula used to determine each PCT's target unified budget includes an element for prescribing which amounts to 15.0% of the total budget, a PCT may spend more or less than this proportion on prescribing. If it spends more on prescribing it must spend less on other elements of health care, but the choice is in principle there.

GP practices receive budgets from their local PCT for staff, IT and other equipment, and also indicative budgets for prescribing. If a practice overspends its budgets in aggregate it is, however, the PCT's ultimate responsibility rather than the practice's to find the funding from within its total budget. The ultimate constraint on GPs is the

¹² After taking out the effect of general price inflation, as represented by the GDP deflator.

knowledge that an overspending practice is taking funds away from other parts of the health service locally.

Aggregate indicators of the uptake of new medicines in the UK (defined as those launched in the last five years) show that the rate of adoption at least of those kinds of new technologies has hitherto been slow relative to other countries in Europe and North America. We have sought the reasons for slow uptake in two ways: a review of the published literature and interviews with 20 GPs acting as PCT prescribing leads. The two lines of inquiry have produced answers that differ in important ways, in particular concerning the role of financial constraints in determining uptake. These differences may reflect major changes that have been made to the NHS since 1999:

- unified budgets for PCTs (and for the HAs that preceded them) which include, for the first time, GPs' prescribing expenditure within the cash-limited total;
- National Service Frameworks backed by strong Government pressure on local NHS bodies to implement them;
- NICE, producing guidance on which health technologies are cost-effective for the NHS and for which, since January 2002, PCTs have been obliged to make funds available to implement them.

Nearly all of the studies referred to in the published literature pre-date those changes; whereas the interviews were undertaken in January and February 2003.

In addition to these structural changes, the apparent discrepancy between findings from the literature review and from the telephone interviews may be due to the particular role of the interviewees. The literature focuses on GPs making decisions in their normal clinical practice. It appears that in this context, GPs in general pay little attention to cost or to financial constraints. However, the people we interviewed were not just GPs but also active participants in their local PCT. The prescribing leads' greater awareness of financial constraints and the impact these had upon innovation may reflect these doctors' involvement at PCT level.

Our review of the available literature found a wide range of factors affecting the uptake of new technologies in UK primary health care. We grouped these according to whether they concerned the people affecting the decisions; the environment or structure provided by the health care system; or the characteristics of the new technologies themselves.

The main actors, but not the only ones, affecting directly or indirectly the uptake of new technologies in primary health care are found to be:

- GPs' personal clinical experience – how do their patients get on with a new medicine or other form of care? The literature identifies this as having a stronger influence than scientific evidence;

- specialist clinicians – both by initiating prescribing which is then continued by the GP looking after the same patient outside hospital; and by providing a local leadership role encouraging the use of new technologies;
- GPs' colleagues and professional peers;
- pharmaceutical company representatives.

HA prescribing advisers were found to have influence in some, but not all, studies. It is too early yet to know whether PCT prescribing advisers, who cover a smaller geographical area than their HA predecessors, will prove more effective as a result of their greater degree of local focus. Other groups were also found by a few studies to have influence, including individual patients and patient groups, but the evidence seems clearest for the people listed above.

The influence of central policy makers seems to depend heavily on the priority attached to a particular policy; in particular the extent to which financial rewards, performance ratings and managers' jobs depend on achieving them. Compliance with National Service Frameworks is strongly pushed by the centre, and apparently with some success according to our interviews. But use of telemedicine, although promoted by the NHS Executive, has not been a high priority and has not been widely taken up. The extent to which NICE guidance is being implemented is the subject of a major research project by the University of York and funded by NICE which is due to report in autumn 2003. We look forward to seeing the results of that study. Full use of technologies, including new technologies, found to be cost-effective is, by definition, desirable.

Important structural and environmental drivers of uptake of primary health care technologies are less clearly identified in the literature than are important 'actors'. Different studies have produced contrasting findings and so, taken together, are largely inconclusive. HAs appear to have had little overall influence. Medical weeklies and bulletins appear to be more influential sources of information than scientific journals. The impact of the changes to the NHS structure and environment since 1999 referred to above, is not yet discernible from the published literature, however.

The MANMED survey found plenty of evidence of primary care organisations attempting to implement medicines management, including prescribing incentive schemes. It is not yet clear what impact this management is having in practice. The evidence of the rest of the literature we reviewed suggests that HAs had limited, if any, success in affecting GPs' behaviour. It is possible that PCTs, being smaller than HAs (about one-third the size) and more locally focused may have greater success, but it is not obvious that size was what prevented HAs from being effective in this regard. Nevertheless, PCTs are still in the early stages of development, so it is too early to judge their effectiveness.

The perceived effectiveness, tolerability and safety characteristics of medicines or other forms of treatment, prevention or diagnosis, certainly seem to affect GPs'

choices of care for their patients. Cost was cited as an influence too, but was generally secondary to effectiveness, tolerability and safety considerations, except where therapeutic equivalence was perceived to exist between alternative courses of action.

Our interviews with PCT prescribing leads – all of them practising GPs – for the current study produced a picture that differs in some important respects from the findings of the literature review, which necessarily covers a slightly earlier period in the NHS's history. The interviews highlighted a strong concern with the level of funding in NHS primary care locally set against the imperatives of satisfying central requirements, including National Service Frameworks and NICE guidance. The result is that most interviewees considered that there exists little local discretion to spend on technologies in primary care other than those that are centrally mandated.

Secondary care and paying off PCTs' accumulated debts, plus the need to finance compliance with National Service Frameworks and NICE guidance are seen as taking most of the increased NHS funding locally. To the extent that debt repayment is a one-off activity, the funds hitherto devoted to that may become available for local discretion and increased NHS activity in future years. But a strong message from the interviews is that, so far, centrally determined requirements, and not local initiatives, dominate spending decisions.

Some major elements of the new NHS General Medical Services (GMS) contract accepted in June 2003 provide financial incentives to GPs to meet specified quality standards and encourage local GP/PCT negotiation to deliver 'enhanced' services (NHS Confederation and BMA 2003). The new contract contains both an opportunity to improve uptake of new primary health care technologies and a threat.

The opportunity arises from two sources. The first is the extent to which the new GMS contract includes cost-effective new technologies among those whose use is directly incentivised by provision of increased funds to practices that use them. The second arises from the change in mood represented by the new contract, from one in which GPs face obstacles to local initiatives to develop new services, to an environment in which they may be explicitly rewarded for providing 'enhanced services' with the agreement of the local PCT.

The threat is that the 'quality framework' proposed in the new contract could turn into an inflexible form of central mandate for use of certain specified technologies – e.g. rewarding GPs for prescribing ACE inhibitors to meet coronary heart disease quality framework requirements – but which by default ignores all other technologies. Thus the desirable aim of improving some aspects of quality may also have the undesirable effect of delaying the use of, or even squeezing out entirely, cost-effective new health technologies because there is a lag of some years before they may get written into the GMS contract.

Our overall conclusion is that encouraging greater uptake of cost-effective new technologies in primary health care requires funding not only to implement NSFs and NICE guidance, but also to provide headroom for local discretion, plus incentives and information so that it will be exploited to the benefit of patients.

7. Recommendations

Expenditure on health care technologies centrally mandated by National Service Frameworks and NICE guidance appears, from the evidence of our interviews with GPs, to be the first claim on PCTs' resources. The extent of compliance with those mandates is unclear but is probably less than full despite the rapid growth in NHS funding since 1998. Legislation and incentives have already been brought to bear on them. That, combined with the planned further large increases in NHS funding over the next few years, provides the right environment for the overall level of compliance to improve. Vigilance by the Department of Health and the Commission for Healthcare Audit and Inspection (from April 2004) will be required to ensure that it does.

But central mandate is too slow, bureaucratic and cumbersome a process to ensure rapid uptake of all new health care technologies that promise, or are known, to be cost-effective. To achieve rapid uptake of all worthwhile technologies in primary health care requires first financial headroom for local innovation by GPs and PCTs, and second incentives and information to exercise that discretion. This prompts us to make the following five recommendations.

- Encouraging the use of cost-effective new medicines and other health technologies in primary care requires that funds are available for discretionary use by PCTs and GPs locally, beyond what is required to implement National Service Frameworks and NICE guidance and meet other central mandates. If NHS funding grows in real terms over the next few years as the government plans, there is realistic hope of such headroom being created. However, there will always be competing claims for all funding. PCTs are already required to report to their local Strategic Health Authority, and thence the Department of Health, their planned expenditure on enhanced primary care services under broad headings (Department of Health 2003c). But these reports do not reveal whether any money has actually been spent on providing new health care technologies; nor are the reports publicly available. ***We therefore recommend that PCTs be required explicitly to ring-fence some funds for new primary health care technologies that are reasonably expected, or already known, to be cost-effective.*** Were new technologies to be encouraged in this way it would be useful if they were to be evaluated in use in order to verify their cost-effectiveness and help identify good practice.
- For the quality framework of the new GMS contract to encourage, and not obstruct, cost-effective innovation, ***a mechanism must be set up to enable speedy inclusion of new cost-effective technologies in the framework as they arise in future.*** Without such a mechanism, the contract risks stifling innovation.
- ***We further recommend that PCTs should be required to state in their annual reports to their local populations how much they have spent on providing what quantities of which new primary health care technologies and services.*** This would enable monitoring, both by NHS bodies and by the general public, and comparison of the performance of different PCTs in this respect.

- Financial incentives, i.e. more funding for GP practices which introduce new technologies, can have strong, but sometimes perverse, effects. Even if a mechanism is implemented to enable speedy inclusion of cost-effective new technologies among those incentivised in the national GMS contract, given the time lags involved in central identification of such technologies, PCTs need also to establish local incentives for the innovative health technologies they or their primary care practitioners wish GP practices in their area to provide. ***We recommend that some or all of the PCT ring-fenced funds recommended above be paid to GP practices on the basis of their achieving target rates of uptake of locally-specified new technologies.*** A clear precedent exists in the prescribing incentive schemes run by all PCTs.
- PCTs clearly have a role in identifying and publicising good practice beyond the dissemination of National Service Framework documents and NICE guidance notes. ***We therefore recommend that PCTs expand their current efforts to deliver advice and assistance to GPs concerning new technologies actively, whether via pharmaceutical advisers or others.*** This is likely to be more productive than making information available without active promotion of it to GPs and other primary health care professionals.
- Apart from their own direct experience, one of the most important influences on GPs' behaviour appears to be that of specialists. Giving specialist consultants an explicit role, and time to carry it out, in advising and helping their primary care colleagues is already being tried piecemeal around the country. ***We recommend that these initiatives be more explicitly encouraged and stimulated nationally.***

General References

ABPI and Department of Health (2002) *PPRS: The Study into the Extent of Competition in the Supply of Branded Medicines to the NHS*, Department of Health: London, December 2002.

Audit Commission (2003a) *Primary Care Prescribing. A Bulletin for Primary Care Trusts*, Audit Commission: London, March 2003.

Audit Commission (2003b) *Achieving the NHS Plan. Assessment of Current Performance, Likely Future Progress and Capacity to Improve*, Audit Commission: London, June 2003.

CancerBacup (2002) *Funding for Cancer Services: an Independent Audit of Cancer Networks in England*, CancerBacup: London, November 2002.

Commission for Health Improvement and Department of Health (2003) *NHS Performance Indicators 2002/03. Final Performance Indicators for PCTs*, CHI and Department of Health: London, 31st March 2003; http://www.doh.gov.uk/performance/2003/pct_list.html

Department of Health (1999) *Resource Allocation: Weighted Capitation Formulas*, Department of Health: Leeds, June 1999.

Department of Health (2001a) *The Government's Expenditure Plans 2001-2002 to 2003-2004 and Main Estimates 2001-2002. Departmental Report*, Cm 5103, Department of Health: London, May 2001.

Department of Health (2001b) *Shifting the Balance of Power: Securing Delivery*, Department of Health: London, July 2001.

Department of Health (2001c) *Health Authority Revenue Resource Limits Exposition Book 2002/03*, NHS Executive Finance Directorate: Leeds, December 2001; <http://www.doh.gov.uk/allocations/2002-2003/expo02-03/index.htm>

Department of Health (2001d) *PCG/PCT Prescribing and Budget-setting 2002/3*, Department of Health: Leeds, December 2001; <http://www.doh.gov.uk/prescribingbudgets/index.htm>

Department of Health (2001e) *HSC 2001/024. Health Authority Revenue Resource Limits 2002/03*, Department of Health: London; 6th December 2001.

Department of Health (2002a) *Expenditure Plans 2002-03 to 2003-04. Departmental Report*, Cm 5403, Department of Health: London, July 2002.

Department of Health (2002b) *Chief Executive's Report to the NHS, December 2002*, including *Statistical Supplement* available at <http://www.doh.gov.uk/public/statsl.htm>, Department of Health: London.

Department of Health (2002c) *Primary Care Trust Revenue Resource Limits 2003/04, 2004/05 & 2005/06*, Health Service Circular HSC 2002/012, Department of Health: London, 18th December 2002.

Department of Health (2002d) *2003/2004 to 2005/2006 Primary Care Trust Revenue Resource Limits Exposition Book*, Finance and Investment Directorate – Resource Allocation, Department of Health: London, December 2002, available at:
<http://www.doh.gov.uk/allocations/2003-2006/>

Department of Health (2003a) *Improvement, Expansion and Reform: the Next 3 Years. Priorities and Planning Framework 2003-2006*, Department of Health: London, March 2003.

Department of Health (2003b) *Delivering the NHS Plan – Expenditure Report*, Department of Health: London, 1st April 2003.

Department of Health (2003c) *Enhanced Services Funding and LDPs*, Chief Executive Bulletin, 14th May 2003, available at:
<http://www.doh.gov.uk/cebuletin/enhancedservices.htm>

Department of Health (2003d) *Investment in Cancer in 2001/02 and 2003/03*, Department of Health: London, May 2003, available at:
<http://www.doh.gov.uk/cancer/investmentincancer.pdf>

Department of Health and the Association of the British Pharmaceutical Industry (ABPI) (2002) *PPRS: The Study into the Extent of Competition in the Supply of Branded Medicines to the NHS*, ABPI and Department of Health: London, December 2002.

Health Committee (2002) *National Institute for Clinical Excellence. Second Report of Session 2001-02. Volume I: Report and Proceedings of the Committee*, HC 515-I, The Stationery Office: London, 3rd July 2002.

Health Service Journal (2002) ‘Cancer millions fail to reach networks again,’ news story, p.6, 15th August 2002.

Mason A, Towse A, Drummond M, Cooke J (2002) *Influencing Prescribing in a Primary Care Led NHS*, Office of Health Economics: London.

NHS Confederation and British Medical Association (BMA) (2003) *New GMS Contract 2003 – Investing in General Practice*, NHS Confederation and British Medical Association: both London, February 2003.

NHS Modernisation Board (2003) *The NHS Plan – A Progress Report. The NHS Modernisation Board’s Annual Report 2003*. Department of Health: London, 2003.

NICE (2002a) List of completed appraisals, available at
<http://www.nice.org.uk/catta1.asp?c=153&mrst=4&dir=ASC>, National Institute for Clinical Excellence: London; accessed on 3rd January 2003.

NICE (2002b) Press release NICE2002/052, 16th October 2002, National Institute for Clinical Excellence: London.

Office of Health Economics (2002) *OHE Compendium of Health Statistics, 14th Edition, 2002*, Office of Health Economics: London.

Pharmaceutical Industry Competitiveness Task Force (PICTF) (2001) *Access and Competitiveness Study*, Department of Health and Association of the British Pharmaceutical Industry: London.

Pharmaceutical Industry Competitiveness Task Force (PICTF) (2002) *Competitiveness and Performance Indicators 2002*, Department of Health and Association of the British Pharmaceutical Industry: London.

Prescribing Support Unit (2002) *How to Use the Budget-setting Utility*,
http://www.psu.co.uk/R_allo.html

Rethink (2002) *Go-slow on Schizophrenia Medicine Choice to Thousands*, press release 3rd December 2002 and <http://www.rethink.org/information/research>

Science and Technology Committee (2002) *Select Committee on Science and Technology Minutes of Evidence Monday 15 July 2002 – Examination of Witnesses*,
<http://www.parliament.the-stationery-office.co.uk/pa/cm200102/cmselect/cmsctech.1101/2071503.htm>

Torbay PCT (2001) *Provisional Prescribing Budgets for General Practice*,
<http://www.torbay-pct.nhs.uk/docs/pcmbulletins/200110Oct01/budget.pdf>

HM Treasury (2002) *2002 Spending Review. Opportunity and Security for All: Investing in an Enterprising, Fairer Britain. New Public Spending Plans 2003-2006*, HM Treasury: London, April 2002.

Wanless D (2002) *Securing our Future Health: Taking a Long-term View. Final Report*, HM Treasury: London, April 2002.

Appendix 1: Literature Review of Factors Affecting Uptake of New Technologies in Primary Health Care

A1.1 Method

The aim of the literature review was to find published research examining influences on the uptake of new technologies in primary care. The review was focussed on studies relating to the UK setting, although research conducted in countries outside the UK was also retrieved where relevant. The review was restricted to articles published in or after 1992 and to those written in English. This section of the report summarises the review findings. References found in the review are given by the numbers in square brackets [-] and these are detailed in Annex 1.1 to this Appendix.

Search strategies were written for databases on OVID and ARC servers. Details of the databases searched can be found in Annex 1.2 to this appendix. An example of a search strategy used (for the Medline database) is given in Annex 1.3. Similar search strategies were used on other databases and are available on request from the authors.

The search strategy produced over 500 hits. These were screened for relevance and 32 references were retrieved. No UK location for one reference [1] could be found. A further 27 references were identified from reference lists or by colleagues. Six studies were subsequently excluded, either because they focussed on implementation techniques [2-4] or because they were found to be of limited relevance [5-7]. In total, 42 papers on 34 studies were included in the detailed review, with the remaining 11 papers providing background information.

It aids clarity to set the results in an overall conceptual framework of the uptake and diffusion of new technologies. This framework is described in the next section and is then followed by an overview of the studies found in our review. Key findings from the review are summarised in Tables A1.1 and A1.2 in Annex 1.4. Table A1.1 describes 27 studies based mainly in primary care and in the UK, while Table A1.2 outlines 12 studies in other settings. Five studies appear in both tables [11-15], because they deal with both primary and secondary care settings.

To provide a fuller picture, two of the technologies reported in the literature are discussed below in more detail as case studies.

A1.2 Conceptual Framework

Health technology may be broadly defined as:

“An internationally recognised term that covers any method used by those working in health services to promote health, prevent and treat disease and improve rehabilitation and long-term care. ‘Technologies’ in this context are not confined to new medicines or pieces of sophisticated equipment.”¹³

¹³ NHS R&D Health Technology Assessment Programme (<http://www.hta.nhsweb.nhs.uk/>)

Technological diffusion, whether in health care or other sectors, may be defined as:

“The progress of a technological innovation in a given social system over a particular period of time. The process takes place in a series of stages, including the adoption and use of the technologies.”[8]

Technological diffusion is a complex phenomenon and there are a number of conceptual frameworks that have developed in the fields of sociology and economics to explain it. According to the classical diffusion paradigm:

“Diffusion... is seen as a particular type of communication that is concerned with new ideas or innovations. In the assumed linear model of communication the message has one direction: from the source to the received. The role of the adopter is that of a passive acceptor.”[9]

Under the linear model referred to in this quote, theoretical research moves on to applied research (in trials), to targeted development, to manufacturing and marketing, to adoption and finally, to use [10]. This ‘science-push’ theory [11] dates back to the 1940s and led to the so-called ‘S-shaped’ curve that describes the rate of technology adoption over time: slowly growing use initially but then accelerating before finally decelerating once more as saturation (which may in practice be at a less than 100% level of adoption) is approached. Under this conceptual framework, key characteristics of the adopters and innovations are examined to help explain this relationship and research using this theoretical framework focuses mainly on the diffusion of medicines.

A second theory took a political perspective, characterising the process of diffusion as a series of power struggles between different groups of decision-makers. Published in the 1960s and 1970s, this body of knowledge has been described as ‘incomplete and scanty’[8] and we do not consider it further.

In the 1980s, organisational theory became a popular explanatory framework for technology diffusion. The scope of research changed: the focus shifted from individual physicians to the health care organisations in which they worked, and the notion of medical technology broadened to include not just medicines, but all categories of medical innovations. The previous, linear model of diffusion was thus rejected in favour of a less systematic and more complex model, involving the interaction of providers and users in an iterative decision-making process [11]. Specifically, Bonair and Persson [9] distinguished three principal determinants of diffusion:

- the actors in the process;
- the structure or environment in which diffusion occurs; and
- the characteristics of the actual innovations.

Our review uses this framework to describe the key determinants considered by studies in the literature. Many factors, such as GP characteristics – age and gender, for instance – are easy to place in this framework (under ‘actors’ in this instance) but

others are less straightforward. For instance, secondary care led prescribing might be seen as a feature of the environment, to do with the structure and organisation of the NHS. However, it could be argued that it is essentially to do with relationships between particular actors, namely hospital consultants and GPs: the consultant's clinical decision influences the GP to adopt the new drug by continuing the patient's prescription.

Despite overlaps such as this example, the framework helps to untangle salient issues. We have placed issues that primarily describe the relationship between actors, such as the example just given, in the 'actor' category. However, the issue of boundaries between primary and secondary care are in the 'structural' section below, because this mainly involves matters such as geographical location, the absence of computerised links and the existence of different agendas or goals operating in the two sectors.

A1.3 UK Studies Set in Primary Care

Twenty-seven studies were found that reported on the factors affecting the uptake of new technologies in primary care (Table A1.1, Annex 1.4). Twenty of these covered medicines, including:

- medicines for Alzheimer's disease [11,14,16,17];
- atypical antipsychotics [18,19];
- statins [12,20];
- other cardiovascular medicines [15,20-27];
- proton pump inhibitors (PPIs) [15,19,21,25,28]; and
- antibiotics [21-23,26].

Ten studies reported on non-medicine technologies, three of which also covered medicines [11,29,30]. Non-medicine topics addressed included:

- genetic assessment [31,32];
- telemedicine [11,33];
- an anticoagulation clinic [13]; and
- a novel method for managing patients with Type II diabetes [34,35].

In terms of study design, eight studies included an analysis of longitudinal data [12,15,18,21,22,28,36,37] and three employed a cross-sectional data analysis [17,20,26]. One study used standard panel data techniques, which combine cross sectional and longitudinal analyses [19]. Three studies used questionnaire surveys [16,17,24] and eight employed face-to-face interviews [13,15,19,23,25,27,32,33]. One randomised controlled trial (RCT) also reported on a parallel process study [34]; and a qualitative and quantitative assessment of findings from another RCT was also reported [24]. The remaining studies were literature reviews and/or 'think pieces' [11,14,29-31,38], one of which also drew on expert opinion [11].

Key **actors** (and their interrelations) considered in the literature for their influence on the adoption and diffusion of new technologies in primary care include:

- GPs (their characteristics);
- hospital consultants;
- the media;
- patients;
- the pharmaceutical industry;
- policy makers;
- prescribing advisers;
- professional bodies / networks / partners.

Four studies found that a GP's personal clinical experience of a new medicine was key to whether or not it was subsequently adopted; i.e. cautious 'experimenting' with one or two patients and waiting for feedback from them before using more widely [15,23,25,27]. The experience of a dramatic clinical event could also trigger a change in prescribing [23,27].

There were mixed findings about any association between GPs' characteristics and the propensity to innovate. Positive associations between the prescribing rate for new medicines and male gender or overseas qualification were found in two studies [17,21] but not in a third that looked specifically at prescribing of PPIs [28]. No significant association was observed between the age of the GP and the rate of uptake of new technologies [17,26].

One study that assessed GPs on an innovation scale concluded that whilst most were cautious and "adaptive", "innovative" GPs had a positive impact on their partners' prescribing [26]. In an interview study of high, medium and low prescribers, all respondents described themselves as cautious and conservative in their prescribing behaviour [27]. However, a small number of high prescribers in this study, individuals with particular expertise in a specific clinical area, appeared more confident to try out new drugs and add them to their therapeutic armamentarium.

Many studies commented on the influence of the patient on the GP's prescribing decisions [19,24,25,27,31,33,34]. The therapeutic relationship between the doctor and patient was found to be of central importance and included patient compliance, patient convenience and patient consent: one study found that patients sometimes declined the GP's offer to switch their medication to a more evidence based alternative [24]. Patient awareness of, and demand for, new technologies could also influence the GP [19,31]. Patient groups were also thought to have exerted an influence on uptake, particularly in the case of new medicines for rare but serious diseases [11].

Three studies considered the effect of the media upon uptake [11,14,22]. All noted an association between the level of media coverage and subsequent prescribing increases, but no attempt was made to assess the relative importance of any impact.

The most commonly cited influential relationship upon GP prescribing was that of the hospital consultant, both as a source of information and as a lead for prescribing. There was some evidence that this relationship was more important than a GP's

relationship with other GP partners [25]. But collaboration with peers was a more important explanatory factor for GPs who were low prescribers of new medicines than for high prescribers [27]. One interpretation is that peers were important sometimes for restraining prescribing but not for increasing it; an alternative explanation is that GPs who are less confident about trying out new drugs are also more inclined to seek others' advice.

However, one study found that the influence of pharmaceutical company sales representatives was the most important source of information for one-third of GPs and a key influence in a GP's ultimate decision to prescribe in 40% of cases [25].

Two studies that assessed the impact of policy makers on uptake concluded that there were cultural problems with the top-down imposition of a new technology. In the case of telemedicine, encouraged by the NHS Executive as a means of reducing inequalities in access, a demonstration project revealed that the new technology constrained the doctor-patient relationship. It was ultimately rejected by the clinicians as a viable means of communication [33]. Equally, despite generous funding for the strategy, the central NHS Executive's goal of an integrated information system across the NHS was slow to develop, partly because local policy makers resisted the perceived challenge to their autonomy [38].

A third study also concluded that top-down policy making was ineffective. The Department of Health issued an 'Executive Letter' to purchasing authorities, advising that beta interferon should be prescribed only under specialist supervision [11], the first time that such a directive had been issued. However, wide variations in purchasing remained a year after the product was licensed in the UK.

Four studies found that prescribing advisers exerted some influence on GPs [15,19,24,27] but support for this finding was not universal [16,17]. All but one of these studies were carried out prior to the advent of primary care organisations and assessed the role of the Health Authority prescribing adviser, who had less involvement at practice level than PCT prescribing advisers do now. Interviews with four PCT prescribing advisers and six HA advisers were included in one study, but findings were not reported separately [19]. Greater GP acceptance of prescribing management was thought to be due to the non-confrontational style of these advisers, but the study did not consider whether this acceptance effected any change in prescribing.

Key **structural or environmental** factors considered in the literature for their influence on the adoption and diffusion of new technologies in primary health care include:

- availability of specialist/institutional care;
- availability of treatment and/or prevention options;
- disease characteristics;
- funding issues;
- GP education;
- national or local guidelines or formularies;

- practice characteristics;
- primary/secondary care barriers;
- quantity and/or quality of evidence;
- statutes, regulations and directives.

There were mixed findings about the impact of practice characteristics on adoption. Fundholding status (available to UK GPs between 1991 and 1999) was reported to be inversely associated with prescribing of PPIs [28] but no association was found for donepezil [17] or statins [20] or certain other cardiovascular medicines [26]. The degree of socioeconomic deprivation suffered by the practice population was found to be inversely association with statin prescribing by one study [20] but no association was found in the study of PPI prescribing [28]. Two studies found evidence that practice size (number of partners) was associated with the uptake of new technologies [17,24] but one study found no association [20].

A number of studies considered the impact of different types of education on the uptake of new technologies. Where an effect was apparent it was small [24,34] and, at best, comprised of one of a series of cues that accumulated to prepare the GP to prescribe [23]. This finding is in line with the conclusions from a systematic review of the implementation literature [39]. There was some evidence that GPs are unimpressed by, or too busy to assimilate, scientific evidence [13,24,25] and that bulletins or medical weeklies are more popular sources of information [15,23,25].

Key **product characteristics** considered in the literature for their influence on the adoption and diffusion of new technologies in primary care include:

- cost;
- effectiveness;
- ‘newness’ (uniqueness);
- safety;
- tolerability.

A consistent finding was that cost was considered only after other factors, particularly effectiveness, safety and tolerability, had been taken into account. Two studies found that GPs ranked patient convenience and/or compliance more highly than cost [15,19]. However, cost was often considered as a backdrop to overall decision-making [23,27] and, in the case of so-called ‘me-too’ products (i.e. where there was perceived to be therapeutic equivalence), cost issues took on more importance in the decision to adopt [11,15,25]. Also there was some evidence that low prescribers of new drugs were indeed more cost-conscious than were high prescribers [27]. Poor effectiveness of current drug therapy and/or adverse event profiles of alternative therapies were factors second only to the influence of the pharmaceutical industry [25]. Concern over side effect profiles associated with new drugs was an important reason for lack of uptake [27].

A1.4 Studies in Other Settings

Although the search strategy was not designed to identify them, 12 studies were found that reported on the factors affecting the uptake of new technologies in either secondary care settings and/or in locations outside the UK. A summary of the findings from these studies is reported in Table A1.2, Annex 1.4.

Some factors identified as influencing uptake differed from those found by the studies in UK primary care. These included:

- the existence of a (hospital) culture that was amenable to technological monitoring [40];
- the importance of cost [12,41,42]; and
- information sources relied upon by specialists, such as early observational studies [42], the scientific literature [15] and conferences [11].

Consultants use evidence as a *social* tool to establish and reinforce their authority and control over diffusion [13] and are responsible for the introduction of most new technologies in secondary care [42].

However, many findings supported those identified in the UK primary care setting. For instance, the importance of specialists' relationships with colleagues [15,41,43] echoed the finding in primary care studies that GPs are highly influenced by their specialist colleagues, although specialists' relationship with GPs is usually more top-down than interactive. The notion of "preparedness to prescribe", documented in an Australian study of the uptake of 'high risk' medicines in secondary care [43], reflected findings from four qualitative studies in the UK that adoption of new technology is an iterative process with feedback loops [15,23,25,27]. A Danish study of GP prescribing [44], like the UK study by Jones and colleagues [15], found considerable variation in the uptake of different new drugs by the same GP.

A1.5 Case Studies

Case Study 1: Anticholinesterases for Alzheimer's Disease

There are currently three medicines licensed for the treatment of Alzheimer's disease in the UK. A survey of HAs in May 2000 found wide variation in both the use and funding of anticholinesterases for Alzheimer's disease [45]. Fewer than half of responding HAs provided funding for anticholinesterases, although over 80% reported that NHS prescribing of the medicines occurred within their area. Most (70%) HAs confined prescribing to secondary care, and one quarter sanctioned joint secondary and primary care prescribing. Reasons for differences in funding decisions included HA perception of cost-effectiveness and the postponement of a decision pending either a drug review or government guidance [45].

Two other studies explored reasons for variation in uptake of Alzheimer's disease medicines. Melzer [14] considered the public and professional perceptions about the

medicines' effectiveness and cost-effectiveness, and highlighted the need for transparent and appropriate reporting of findings from clinical trials. The importance of good relations between the regulatory bodies and the pharmaceutical industry in providing such information was stressed.

Martin and colleagues [17] examined HA advice regarding the prescribing of donepezil, and linked this with a postal survey of all GPs in England that had prescribed donepezil to two or more patients within six months of the launch of the drug. Findings were compared with responses from a random sample of GPs who had not prescribed donepezil ("non-prescribers"). Prescribing advice did not appear to be correlated with early prescribing of donepezil. Most HA prescribing advisers reported that they had advised GPs not to initiate an FP10 prescription for any licensed drug for Alzheimer's disease (83% of responders), but proportions of prescribers (58%) and non-prescribers (57%) that were located within these HAs were very similar. Equally, where Health Authorities had advised that GPs should not prescribe the medicines even under specialist supervision (63%), the proportions of prescribers and non-prescribers within these HAs were identical (37%). Only 7% of HAs indicated that GPs were free to make their own decision and the proportion of all prescribers (4%) and non-prescribers (6%) from these HA was too small to detect a significant difference.

Prescribers were more likely than non-prescribers to be male, to be from training practices and from larger group practices [17]. Prescribers were less likely to consider financial constraints, although fundholding status appeared to be unrelated to prescribing propensity. There was little difference between the two groups in terms of knowledge about the disease or in management strategies and most responders indicated that their main role was not to medicate but to support. Unsurprisingly, prescribers were more likely to agree that the medicines should be prescribed for patients with mild or moderate disease and that GPs should initiate prescribing. However, a key point was that most prescriptions (66%) had been initiated by a specialist.

In January 2001, NICE issued guidance about the prescribing of these medicines, recommending that only specialists should initiate treatment and that GPs should prescribe anticholinesterases only under a shared care protocol with clear treatment endpoints. A follow-up survey of HA prescribing advisers in February 2002 [16] demonstrated that a more consistent approach had emerged in the provision and funding of anticholinesterases than had been found in the survey predating NICE guidance [45]. All responding HAs had formally approved the medicines and three-quarters had specifically dedicated funding. All but one respondent reported NHS prescribing of the medicines within their HA. No respondent recommended GP initiation of prescribing, but over half sanctioned shared care arrangements and boundaries between primary and secondary care had obstructed compliance for only a minority of HAs.

The decision by GPs to prescribe donepezil appears to be a complex one. Key GP characteristics associated with donepezil prescribing include GP gender and the individual GP's attitude to funding concerns [17] but fundholding status appeared to be unrelated. Secondary care led prescribing was key and may have become even

more important since NICE issued its guidance. NICE’s guidance appears to have affected HA funding decisions and advice, but there is no evidence yet of any impact on GP prescribing [16]. An association with other structural factors was found, such as the number of partners in the practice or its training status, but there was no evidence that knowledge of the disease or of the management strategy influenced the decision to prescribe. A difference in perception of the medicine’s characteristics by prescribers and non-prescribers was identified [17].

Case Study 2: Genetic Risk Management

The new genetics are one example of an innovative health care technology. New and/or better tests have become available that facilitate the assessment of genetic risk for both rare and common diseases [31]. Some examples of the types of genetic testing that are available are given in Box A1.1.

Box A1.1: The New Genetics	
<i>Type of genetic testing</i>	<i>Example of disease area</i>
Better tests for uncommon conditions	Cystic fibrosis
New tests for rare causes of common conditions	Breast cancer, early onset Alzheimer’s
New tests for common genetic contributions to common conditions that identify risk predisposition (or risk protection) alleles for common chronic conditions (“predispositional” tests)	Breast cancer, ovarian cancer

In the UK, genetic testing is currently undertaken at specialist regional centres or at private genetic companies. The specialist centres mainly deal with relatively rare inherited and congenital disorders and referrals to these centres are rarely made by GPs. Instead, GPs typically refer patients to a specialist in the relevant disease area (e.g. neurologist, oncologist), who may then refer the patient on to a geneticist [31]. The availability of genetic tests has led to rising patient demand for genetic information and advice [31,32].

UK specialist genetic centres are “struggling to cope with increased workloads” [31]. One reason why specialist centres are overworked is the small number of geneticists, which is about 1-2 per million population. GPs outnumber geneticists by a ratio of 500:1 [32] and health policy makers are keen that GPs should embrace new skills and roles. Specifically, policy makers would like GPs to be skilled in the assessment of genetic risk; to discuss the implications of genetic testing with patients; and to control access to specialist referral centres. However, GPs appear reluctant to adopt this new role:

“GPs are sick to death of being asked to do traditional secondary care as primary care. Where do we get the time to see our normal patients and do what GPs traditionally do?” (quoted in [32])

GPs see the new genetics as “another in a series of changes imposed on general practice” [32]. Interviews with policy makers and experts support this view, perceiving the new technology not as a mere extension of the GP role, but as a new skill set to be added onto existing practice. However, GPs stress the importance of the traditional skills of patient advocacy and patient centred care [32]. Having a holistic view of the patient – and the patient’s relatives – in terms of their environment, lifestyle, diet, smoking and drinking habits, is perceived as a key strength of the generalist doctor.

Although GPs are aware of the availability of genetic tests, they often seem reluctant to discuss these with patients. The first reason for this reluctance is the presence of a ‘therapeutic gap’: if the patient were to find out that they had a predisposition to a particular disease, and if no treatment or preventative measure were available, would such knowledge be in the patient’s interest? Could such knowledge adversely affect the patient’s quality of life? Secondly, GPs feel that patients might be less inclined to follow lifestyle advice if they knew of a genetic predisposition and thus felt the issue was one of ‘fate’ and not under the patient’s control.

To summarise, whether GPs will take up a new role in genetic services will depend on a number of factors. Firstly, the workload of specialist genetic services, generated in part by patient demand, may put pressure on GPs to adopt new roles. Secondly, the extent to which GPs feel that an extended role will enhance their traditional skills, rather than jeopardise them, will affect their willingness to accept new roles. Thirdly, the availability of treatment or prevention for the disease appears to govern GPs’ willingness to introduce the topic of new genetic technologies into the dialogue between patient and doctor. Lastly, GPs’ perception of the impact on the patient that might result from use of the new technology affects whether the technology is used.

An external influence determining whether the remit of primary care includes the management and assessment of genetic risk is government guidance: if NICE appraises and approves the technology, then funding must be provided. A NICE guideline for familial breast cancer is currently under development; this may provide guidance regarding GPs’ role.

Annex 1.1: References Found in the Literature Review

1. Bosanquet N. A strategy for primary care: development plans for Birmingham. *Health Policy Unit Review Papers: 8*. Cambridge: Daniels Publishing, 1994.
2. Ashworth M, Armstrong D, Lloyd D, Colwill S. The effects on GP prescribing of joining a commissioning group. *Journal of Clinical Pharmacy and Therapeutics* 2002;27(3):221-228.
3. Avery AJ, Walker B, Heron T, Teasdale SJ. Do prescribing formularies help GPs prescribe from a narrower range of drugs? A controlled trial of the introduction of prescribing formularies for NSAIDs. *British Journal of General Practice* 1997;47(425):810-4.
4. Wensing M, Van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? *British Journal of General Practice* 1998;48(427):991-997.
5. Booth N, Jain NL, Sugden B. The TextBase project – implementation of a base level message supporting electronic patient record transfer in English general practice. *Proceedings/AMIA Annual Symposium* 1999:691-5.
6. McCarthy M, Wilson-Davis K, McGavock H. Relationship between the number of partners in a general practice and the number of different drugs prescribed by that practice. *British Journal of General Practice* 1992;42(354):10-2.
7. Rimmer B, Ross SK. Perspectives on primary care prescribing. *Health Bulletin, Edinburgh* 1997;55(4):243-262.
8. Battista RN. Innovation and diffusion of health-related technologies. A conceptual framework. *International Journal of Technology Assessment in Health Care* 1989;5(2):227-48.
9. Bonair A, Persson J. Innovation and Diffusion of Health Care Technologies. In: Szczepura A, Kankaanpaa J, editors. *Assessment of Health Care Technologies: Case studies, Key Concepts and Strategic issues*. Chichester: John Wiley & Sons, 1996.
10. Gelijns A, Rosenberg N. The dynamics of technological change in medicine. *Health Affairs* 1994:28-46.
11. Robert G, Stevens A, Gabbay J. 'Early warning systems' for identifying new healthcare technologies. *Health Technology Assessment (Winchester, England)* 1999;3(13):iii-99.
12. Booth-Clibborn N, Packer C, Stevens A. Health technology diffusion rates. Statins, coronary stents, and MRI in England. *International Journal of Technology Assessment in Health Care* 2000;16(3):781-6.
13. Ferlie E, Fitzgerald L, Wood M. Getting evidence into clinical practice: an organisational behaviour perspective. *Journal of Health Services Research & Policy* 2000;5(2):96-102.

14. Melzer D. New drug treatment for Alzheimer's disease: lessons for healthcare policy. *BMJ* 1998;316(7133):762-4.
15. Jones MI, Greenfield SM, Bradley CP. Prescribing new drugs: qualitative study of influences on consultants and general practitioners. *BMJ* 2001;323:378-81.
16. Mace S, Taylor D. Adherence to NICE guidance for the use of anticholinesterases for Alzheimer's disease. *Pharmaceutical Journal* 2002;269:680-81.
17. Martin RM, Rink E, Wilkinson DG, Mann RD. Did knowledge, opinions, background, and health authority advice influence early prescribing of the novel Alzheimer's disease drug donepezil in general practice? National postal survey. *Pharmacoepidemiology & Drug Safety* 1999;8(6):413-422.
18. Stark C, et al. Anti-psychotic drug prescribing trends in primary care in Scotland 1994-97. *Health Bulletin* 2000;58(2):96-101.
19. Prescribing Research Group. Component 4: Demand-side effectiveness. In: Department of Health, ABPI, editors. *PPRS: The Study into the Extent of Competition in the Supply of Branded Medicines to the NHS*. London: Department of Health, 2002.
20. Packham C, Robinson J, Morris J, Richards C, Marks P, Gray D. Statin prescribing in Nottingham general practices: a cross-sectional study. *Journal of Public Health Medicine* 1999;21(1):60-4.
21. Inman W, Pearce G. Prescriber profile and postmarketing surveillance. *Lancet* 1993;342(8872):658-61.
22. McGavock H, Webb CH, Johnston GD, Milligan E. Market penetration of new drugs in one United Kingdom region: implications for general practitioners and administrators. *BMJ* 1993;307(6912):1118-20.
23. Armstrong D, Reyburn H, Jones R. A study of general practitioners' reasons for changing their prescribing behaviour. *BMJ* 1996:949-52.
24. Nazareth I, Freemantle N, Duggan C, Mason J, Haines A. Evaluation of a complex intervention for changing professional behaviour: the Evidence Based Out Reach (EBOR) Trial. *Journal of Health Services & Research Policy* 2002;7(4):230-8.
25. Prosser H, Almond S, Walley T. Influences on GPs' decision to prescribe new drugs - the importance of who says what. *Family Practice* 2003;20(1):61-8.
26. Salisbury C, Bosanquet N, Wilkinson E, Bosanquet A, Hasler J. The implementation of evidence-based medicine in general practice prescribing. *British Journal of General Practice* 1998;48(437):1849-52.
27. Jacoby A, Smith M, Eccles M. A qualitative study to explore influences on general practitioners' decisions to prescribe new drugs. *British Journal of General Practice* 2003:120-125.

28. Jones MI, Greenfield SM, Jowett S, Bradley CP, Seal R. Proton pump inhibitors: a study of GPs' prescribing. *Family Practice* 2001;18(3):333-8.
29. Rosen R. Can NICE influence the diffusion of new technologies? In: Appleby J, Harrison A, editors. *Health care UK 1999/2000: the King's Fund review of health policy*. London: King's Fund, 1999;6-8.
30. Stocking B. The introduction and costs of new technologies. In: Beck E, Lonsdale S, Newman S, Patterson D, editors. *In the best of health? The status and future of health care in the UK*. London: Chapman and Hall, 1992:326-348.
31. Kinmonth A-L, Reinhard J, Bobrow M, Pauker S. The new genetics: implications for clinical services in Britain and the United States. *BMJ* 1998;316(7133):767-770.
32. Kumar S, Gantley M. Tensions between policy makers and general practitioners in implementing new genetics: Grounded theory interview study. *BMJ* 1999; 319(7222):1410-1413.
33. May C, Gask L, Atkinson T, Ellis N, Mair F, Esmail A. Resisting and promoting new technologies in clinical practice: the case of telepsychiatry. *Social Science & Medicine* 2001;52(12):1889-1901.
34. Pill R, Stott NCN, Rollnick SR, Rees M. A randomized controlled trial of an intervention designed to improve the care given in general practice to Type II diabetic patients: Patient outcomes and professional ability to change behaviour. *Family Practice* 1998;15(3):229-235.
35. Stott NC, Rees M, Rollnick S, Pill RM, Hackett P. Professional responses to innovation in clinical method: diabetes care and negotiating skills. *Patient Education & Counseling* 1996;29(1):67-73.
36. Dixon S, Coleman P, Nicholl J, Brennan A, Touch S. Evaluation of the impact of a technology appraisal process in England: The South and West Development and Evaluation Committee. *Journal of Health Services & Research Policy* 2003;8(1):18-24.
37. Roberts SJ, Feely M, Bateman DN. Prescribing of anti-epileptic drugs in the Northern and Yorkshire region: 1992-1995. *Seizure* 1998;7(2):127-32.
38. Dhillon G, Hackney R. IS/IT market support systems: augmenting UK primary health care groups. *Topics in Health Information Management* 1999;20(2):83-90.
39. NHS Centre for Reviews and Dissemination. *Effective health care: getting evidence into practice*. London: Royal Society of Medicine Press, 1999:16.
40. Bassett KL, Iyer N, Kazanjian A. Defensive medicine during hospital obstetrical care: a byproduct of the technological age. *Social Science & Medicine* 2000;51(4):523-37.

41. Freed GL, Clark SJ, Konrad TR, Pathman DE. Factors affecting physicians' early adoption of combined DTP-Hib vaccine. *Ambulatory Child Health* 1997;3(1 I):27-33.
42. Rosen R, Mays N. The impact of the UK NHS purchaser-provider split on the 'rational' introduction of new medical technologies. *Health Policy* 1998;43(2):103-23.
43. Peay MY, Peay ER. Innovation in high risk drug therapy. *Social Science & Medicine* 1994;39(1):39-52.
44. Steffensen FH, Sorensen HT, Olesen F. Diffusion of new drugs in Danish general practice. *Family Practice* 1999;16(4):407-413.
45. Taylor D, Mace S, Fry C. The use of anticholinesterases for Alzheimer's disease in Britain. *Pharmaceutical Journal* 2001;266:263.
46. *Pharmaceutical Industry Competitiveness Task Force: Final Report*. London: Department of Health, 2002.
47. Griffin JP, Griffin TD. The economic implications of therapeutic conservatism. *Journal of the Royal College of Physicians of London* 1993;27(2):121-6.
48. Department Of Health. A First Class Service: Quality in the New NHS. *Consultation Document on Quality in the New NHS*. London: Department of Health, 1998:86.
49. Health Committee. *National Institute for Clinical Excellence: second report of session 2001-02: Vol. I: Report and proceedings of the Committee. Session 2001-02; HC 515-I*. London: The Stationery Office, 2002.
50. Marshall M, Sheaff R, Rogers A, Campbell S, Halliwell S, Pickard S, et al. A qualitative study of the cultural changes in primary care organisations needed to implement clinical governance. [Comment]. *British Journal of General Practice* 2002:641-5.
51. Watkins C, Harvey I, Carthy P, Moore L, Brawn R. Attitudes and behaviour of general practitioners and their prescribing costs: a national cross sectional survey. *Quality & Safety in Health Care* 2003:29-34.
52. NICE. Imatinib (Glivec) is NICE's 50th Technology Appraisal Guidance. Press Release 2002;2002/052.
53. Fletcher AP. Prescriber profile and postmarketing surveillance. *Lancet* 1993; 342(8880):1179.
54. Inman WH, Pearce G. Prescriber profile and postmarketing surveillance. *Lancet* 1993; 342(8885):1491.
55. Kimbel KH. Prescriber profile and postmarketing surveillance. *Lancet* 1993; 342(8880):1178-9.

56. Leufkens HG, Urquhart J. Prescriber profile and postmarketing surveillance. *Lancet* 1993;342(8880):1178.
57. Wells F. Prescriber profile and postmarketing surveillance. *Lancet* 1993;342(8880):1178.
58. The NHS in action: Dr Lionel Joyce, Chief Executive, Newcastle City NHS Trust. *Government Business, London, Issue* 1998;9:25-27.
59. Rosen R. Applying research to health care policy and practice: medical and managerial views on effectiveness and the role of research. *Journal of Health Services & Research Policy* 2000;5(2):103-8.
60. Mason A, Towse A, Drummond M, Cooke J. *Influencing prescribing in a primary care led NHS*. London: Office of Health Economics, 2002.

Annex 1.2: Databases Searched

Review/ search topic: Uptake of new technologies in primary care

Database	Server	Dates covered by database	Date searched	Number of hits	Text file reference	Search history reference
AMED	OVID	1985-2002/11	05/12/02	3	amed 05-12-02.txt	search history AMED 05-12-02.doc
Cinahl	OVID	1982-2002/10	05/12/02	25	cinahl 05-12-02.txt	search history AMED 05-12-02.doc
DHData / King's Fund Database	Silverplatter/ ARC	1983 – 2002/11	05/12/02	201	Dhdkf.txt	APG1.HIS
Econlit	Silverplatter/ ARC	1969-2002/10	05/12/02	1	econlit.txt	APG1.HIS
Embase	OVID	1980-2002/11	26/11/02	316	embase 05-12-02.txt	search history Embase 05-12-02.doc
Helmis	Silverplatter/ ARC	1984 – 1998 (checked)	05/12/02	19	Helmis.txt	APG1.HIS
Medline	OVID	1966-2002/10	05/12/02	152	medline 05-12-02.txt	search history Medline 05-12-02.doc
PAIS	Silverplatter/ ARC	1972-2002/10	05/12/02	0		APG1.HIS
SIGLE	Silverplatter/ ARC	1980-2002/06	05/12/02	0		APG1.HIS
Sociological abstracts	Silverplatter/ ARC	1986-2002/09	05/12/02	4	socio.txt	APG1.HIS

Total

Total number of Records 721

Endnote Library

Number imported into Endnote 721

Total number after deduplication 649

Total number after manual deduplication 528

Annex 1.3: Search Strategy (for the Medline Database)

1. Family Practice/
2. PHYSICIAN'S ROLE/ or PHYSICIANS, FAMILY/ or PHYSICIAN'S PRACTICE PATTERNS/
3. general practi\$.ab,ti.
4. family practi\$.ab,ti.
5. (gp or gps).ab,ti.
6. (family doctor\$ or family physician\$).ab,ti.
7. (primary care or primary health care or primary healthcare or pcg or pct or pco).ab,ti.
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. (NHS or national health service).mp.
10. (britain or united kingdom or uk or gb).ab,cp,ti.
11. (england not new england).mp.
12. (british or english or scottish or irish or welsh).ti,ab.
13. (scotland or northern ireland or n ireland).ab,ti,cp.
14. (wales not new south wales).mp.
15. 9 or 10 or 11 or 12 or 13 or 14
16. (new or innovat\$ or different or novel).ti,ab.
17. (technolog\$ or drug\$ or medicine\$ or device\$ or procedure\$ or system\$ or therap\$ or treatment\$ or molecu\$ or intervention\$ or pharmaceutical\$ or product\$).ti,ab.
18. ((new or innovat\$ or different) and (technolog\$ or drug\$ or medicine\$ or device\$ or procedure\$ or system\$ or therap\$ or treatment\$ or molecu\$ or intervention\$ or pharmaceutical\$ or product\$)).ti,ab.
19. (uptake or implement\$ or adopt\$ or diffus\$ or promot\$).ti,ab.
20. diffusion of innovation/
21. 19 or 20
22. 18 and 21
23. 8 and 15 and 22
24. limit 23 to (english language and yr=1992-2002)

Annex 1.4: Tables of Uptake Literature Review Findings

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
Armstrong et al. 1996 [23]	Qualitative analysis of semi-structured interviews with 18 GPs	Medicines, especially ACE inhibitors; fluoxetine; antibiotics for H pylori	South East London, UK Primary care	GPs Patients Hospital consultants	Volume/authority of evidence Educational events Cost pressures Therapeutic 'challenges'	Effectiveness Adverse events	Individual GP prescribing is relatively stable over time, with 3 or 4 changes over a 6-month period. Reasons for change were complex. Most changes needed a period of preparation, but some occurred following a challenge to usual routines.
Booth-Clibborn, Packer et al. 2000 [12]	Longitudinal analysis (3 years) of prescribing data	Statins	West Midlands, UK Primary care	Reports factors pertaining to secondary care only – see Table A2			Statins diffused rapidly within primary care, with expenditure rising 81% over 3 years, from £2.8 million in 1995 to £15 million in 1998.
Dhillon & Hackney 1999 [38]	Literature review / think piece	NHS Information Strategy	UK Primary care	Policy makers / planners GPs	NHS modernisation Internal market Technological revolution Primary/ secondary care boundaries	Market support system	"If IS/IT is to be correctly managed, gain acceptance and attain a role as a mechanism for decision support, it must be driven from the bottom by those physicians in the front-line market and it must be appropriate."
Dixon et al, 2003 [36]	Postal surveys Telephone interviews Longitudinal analysis of	Cervical screening Antenatal care	UK Primary care	Directors of Public Health Clinical / Medical	South & West Development and Evaluation Committee (DEC)	Frequency of screening / clinic visits	The DEC reports recommended a reduction in the frequency of cervical screening / antenatal visits. While health authority personnel felt the

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
	routine NHS data (4 case studies)			Directors from acute and community NHS Trusts Lead GPs			DEC reports were of good quality and had influenced clinical practice, hospital doctors were more equivocal. Data analysis failed to demonstrate any impact of the reports on clinical practice.
Ferlie, Fitzgerald et al. 2000 [13]	Case study (using interviews) of devolution of secondary care clinic to primary care	Anticoagulation clinic for patients at high risk of stroke, run by nurses using computerised decision support system	North Thames, UK Primary / secondary care	Local opinion leader GPs Managers	Funding uncertainty Medico-legal uncertainty Primary/ secondary care divide	Quality of evidence base	Project was unsuccessful. There was a weak link between the quality of the evidence base and rate of uptake. NHS management played a limited role in enabling clinical change.
Inman & Pearce 1993 [21]; Fletcher 1993 [53]; Inman & Pearce 1993 [54]; Kimbel 1993 [55]; Leufkens & Urquhart 1993 [56]; Wells 1993 [57]	Longitudinal analysis (7 years) of prescribing data for over 28,000 GPs	New medicines monitored by the Prescription Event Monitoring (PEM) system (10 categories of drug)	England, UK Primary care	GPs Pharmaceutical companies	Safety monitoring systems Post marketing surveillance	Safety	Prescribing of new medicines was associated with male gender, and qualification overseas, and inversely associated with response to requests for post-marketing data. Response to the PEM system was generally higher for the more innovative preparations. Promotional post-marketing surveillance may distort prescribing patterns and adversely affect response to PEM system.
Jacoby et al, 2003 [27]	Semi-structured interviews with 56 GPs, selected as a purposive	8 innovative/semi-innovative medicines: finasteride; fluticasone	Northern & Yorkshire region, UK	GPs Practice	Education: literature, workshops	Efficacy Safety	Findings focussed on GP characteristics. GPs own past clinical experience, level of confidence, expertise in clinical areas and

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
	sample of high, medium and low prescribers of the 8 new drugs	(asthma); losartan (hypertension); meloxicam; nicorandil; ranitidine bismuth citrate; tramadol; venlafaxine	Primary care	partners/locums Hospital consultants Pharmaceutical companies Pharmaceutical advisers Patients	Guidelines Practice characteristics: fundholding status; practice size	Tolerability Compliance issues (dosing, delivery mode) Cost Newness	cost-consciousness were key influences. Both low and high prescribers saw themselves as cautious and conservative. Low prescribers appeared to be more influenced by group norms (adherence to practice formulary; awareness of partners' prescribing patterns).
Jones, Greenfield et al, 2001 [28]	Longitudinal analysis (3 years) of prescribing data for 50 GPs who regularly used a teaching hospital	PPIs: lansoprazole omeprazole pantoprazole	Birmingham, UK Primary care	GPs Hospital consultants	Primary/secondary care boundaries Practice characteristics: fundholding status; number of partners; list size; gender; date and place of qualification; training status Deprivation (Townsend index)	Costs	GP and practice variables explain only a small proportion of the variation in prescribing costs. Fundholders were more likely to prescribe fewer PPIs, Royal College of General Practitioners members to prescribe slightly more. There was some evidence that prescribing of lansoprazole was hospital led. No association found between prescribing propensity and gender, place of qualification, age, practice list size or Townsend deprivation index.
Jones et al. 2001 [15]	Interviews with 50 GPs and 38 hospital consultants	New /newly prescribed drugs, including a list of 8 (1 PPI; 3 SSRIs; 1	Birmingham, UK Primary and	GPs Hospital	Education (literature, meetings) Effectiveness / side-	Therapeutic value	GPs were inconsistent in their uptake of new drugs. 86% of the GPs had prescribed 5-7 of the 8

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
	Longitudinal analysis (2¾ years) of GP prescribing data	ACE inhibitor; 1 potassium channel activator; 1 biphosphonate; 1 beta adrenoceptor stimulant)	secondary care	consultants Pharmaceutical company reps	effects profile in alternative pharmaceuticals Availability of alternative pharmaceuticals	Cost Side effect profile Interactions with other drugs Dose (once daily vs. twice daily) Safety	drugs listed. 'Use' for GPs often excluded secondary care led prescribing. GPs had little awareness of new drugs before launch and often relied on pharmaceutical company information. Hospital consultants were also an important influence. Willingness to prescribe varied with perceived risk. Cost was generally secondary to other considerations, such as effectiveness and tolerability.
Kinmonth, Reinhard et al. 1998 [31]	Literature review	Genetic risk assessment and management	UK and US Primary care	Patients and relatives GPs Hospital consultants Patient groups	Prevalence of disorder Availability of therapeutic /preventative choices	Sensitivity and specificity of tests	US and UK have different cultures; innovation may be faster in the US, but there may be a greater opportunity for development within a research framework within the UK.
Kumar & Gantley 1999 [32]	Interviews with 12 GPs and 2 geneticists	Genetic services	UK Primary care	GPs Geneticists Policy makers Patients and relatives	Specialist services available Therapeutic/ preventative choices available Education	Not addressed	GPs emphasised the need to build on current practice, whereas policy makers focused on extending GPs' role to include new skills.

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
Mace & Taylor 2002 [16]; Taylor et al. 2001 [45]	Questionnaire surveys of HA prescribing advisers (95 advisers in 2000; 63 in 2002)	Anticholinesterases for Alzheimer's disease	England and Wales, UK Primary care	NICE Specialists GPs HA prescribing advisers	HA funding provision NICE guidance Primary and secondary care boundaries Protocols	Not addressed	In January 2001, NICE recommended that anticholinesterases be made available on the NHS. In 2002, although all HAs had approved the use of the medicines, one quarter of HAs provided no formal funding. In both surveys, NHS prescribing occurred regardless of HA funding provision, with NHS trusts and primary care organisations providing alternative financial support.
Martin, Rink et al. 1999 [17]	National postal survey of 75 HA pharmaceutical advisers Structured postal survey of 311/473 GPs who prescribed donepezil to ≥ 2 patients within 6 mths of launch compared with random sample of 484/947 non-prescribers	Anticholinesterases for Alzheimer's disease	England, UK Primary care	HA prescribing advisers GPs	Pharmaceutical advice Financial constraints Primary/secondary care boundaries	GP perceptions of appropriateness and effectiveness	Early prescribers and non-prescribers had received similar HA advice. Early prescribers differed from non-prescribers in their opinions about using Alzheimer's disease medicines.
May, Gask et al. 2001 [33]	Qualitative study (ethnographic); interviews with 15 professionals	Telemedicine for psychiatric referral assessment	UK (area not stated) Primary care	GPs Mental health professionals	Primary/secondary care boundaries Technological revolution	Technological limitations	The system was ultimately rejected because it threatened the nature and practice of the doctor-patient relationship.

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
	(psychiatrists, GPs, mental health professionals and technical experts) and 22 patients			Patients Policy makers			
McGavock, Webb et al. 1993 [22]	Longitudinal analysis (4 years) of country-wide community prescribing data, using defined daily doses	Market penetration of new medicines: ACE inhibitors H2 receptor antagonists antibiotics	Northern Ireland, UK Primary care	GPs Media Pharmaceutical industry	Disease prevalence Competitor medicines Local laboratory reporting policy (antibiotics)	Order of market entry	Prescribing of the 3 classes of drug increased rapidly over the study period. First drug on the market usually retained the largest share. Second drug flourishes, but remains less successful than the market leader for at least 4 years. Increases in the volume of prescribing may be due to company marketing activities, rather than changes in disease prevalence.
Melzer 1998 [14]	Review / think piece	Anticholinesterases for Alzheimer's disease	UK, US, Europe Primary and secondary care	NICE Patients/carers Manufacturers Professional bodies Funding bodies Media	Prevalence of disorder Ageing population Access to institutional care Availability of information/evidence	Perceived and actual benefits	Improved regulation of new technologies requires examination and debate of the relevant evidence. Overvaluing new technology may threaten funding for vital, but more mundane care.
Nazareth et al, 2002 [24]	Questionnaire surveys of GPs from 52 practices	Evidence based guidelines on NSAIDs, antidepressants, aspirin	North of England and London, UK	GPs Pharmacists	Evidence based guidelines	Clinical effectiveness	Most GPs remembered pharmacist's visit; few could recall content of guideline; still fewer had applied it in clinical practice.

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
	Questionnaire surveys and interviews with 12 pharmacists	and ACE inhibitors.	Primary care		Practice size	Cost saving	Main barriers identified by pharmacists to the implementation of the guidelines were: organisational problems (e.g. inability to access echocardiographic diagnosis); GP scepticism of evidence base; and lack of interest in changing prescribing behaviour.
Packham, Robinson et al. 1999 [20]	Cross-sectional analysis of prescribing and practice data within one HA	Statins for cardiovascular disease	Nottingham, UK Primary care	GPs Patients	Deprivation (Townsend index; Jarman UPA(8) index) Practice characteristics: size; fundholding status; training status; number of partners Fibrate prescribing rates Medical referral rates Cardiovascular drug costs (net of lipid costs)	Not addressed	Significant inverse relationship between rate of statin prescribing and level of deprivation of that practice's population. Prescribing of other lipid-lowering agents of the fibrate class was positively associated with statin prescribing. No other practice characteristic was found to be associated with statin prescribing levels.
Pill, Stott et al. 1998 [34]; Stott, Rees et al. 1996 [35]	RCT and parallel prospective process study of 29 GP practices	Evidence-based, personal care plans, using visual aids to encourage patient participation, for patients with Type II diabetes	South Glamorgan, Wales, UK Primary care	GPs Nurses Patients	Training sessions for clinicians and nurses	Acceptability of innovation to professionals Need for behavioural change in professionals	The intervention achieved behavioural change in fewer than 20% of clinicians and there was no significant clinical improvement in the experimental group of patients relative to the control group.

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
		Control: printed educational materials					
Prescribing Research Group et al. 2002 [19]	Literature review Interviews with 60 key stakeholders Econometric analysis of prescribing data	9 therapeutic areas (for the econometric analysis): PPIs; SSRIs; migraine treatments; antirheumatics; loop diuretics; antipsychotics; broad spectrum penicillins and cephalosporins; tricyclic antidepressants; calcium antagonists	UK Primary care	GPs Hospital consultants Pharmaceutical industry Government Patients Practice nurses Pharmaceutical advisers	NICE guidance Pharmaceutical Price Regulation Scheme	Clinical efficacy Safety Tolerability Patient convenience /compliance Cost	Prescribers consider costs only after taking into account clinical efficacy, safety, tolerability and (often) patient compliance or convenience. Important factors in GPs prescribing a new drug are a clear therapeutic advantage over current alternatives and peer influence, especially from hospital consultants.
Prosser et al, 2003 [25]	Semi-structured interviews with 107 GPs using critical incident technique	19 new drugs launched between January 1998 and May 1999	North West England, UK Primary care	GPs Professional colleagues Patients Pharmaceutical industry	Educational information	Effectiveness Side effects profile Cost New 'class' of drug	The main influence on GPs' decision to initiate prescribing of a new drug was the company pharmaceutical representative. Other factors included failure of, or intolerance to, current therapy; patient requests; convenience and patient acceptability; side-effect profile of new drug; local and national guidelines; hospital consultant endorsement.
Robert, Stevens	Review of methods for	Biosensor for home	UK	GPs	Dissemination of	Cost-	The dynamic and evolutionary nature of

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
et al. 1999 [11]	early detection of new technologies	glucose monitoring Telemedicine Beta interferon Dornase alfa for cystic fibrosis Donepezil	Primary care	Hospital consultants Patient interest groups Pharmaceutical companies Professional organisations Department of Health Media	evidence: journal publications, conference proceedings Technological development Technological and professional networks Regulations/directives	effectiveness profile Evolution of products Number and type of competitor products	innovation is particularly important in influencing the uptake of non-medicines. Government, professional and patient bodies are all important actors in determining the uptake of new medicines.
Roberts, Feely et al. 1998 [37]	Longitudinal analysis (4 years) of GP prescribing volume (adjusted items) and cost in 16 HA areas	Antiepileptic medicines (AEDs)	North of England, UK Primary care	GPs Hospital consultants	Clinical trial locations Severity of disease	Cost	Prescribing volume increased by 15% over the study period, of which 1/3 was due to increased usage of newer medicines. Percentage increase in prescribing cost not reported. Notable differences in volume and choice of AEDs used in different HA areas. New medicines taken up earlier in the teaching hospital health districts.
Rosen, 1999 [29]	Think piece	New technologies for NICE appraisal	England, UK	NICE Primary Care Organisations	Quality of data used in appraisals 'Technology creep'	Rapid evolution of new technologies	Given their overwhelming workload, Primary Care Organisations will not necessarily prioritise work to influence technology diffusion... and it is now much

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
				NHS trusts	(application of existing technologies to new patient groups)		harder to exert political or financial leverage over (NHS) trusts in relation to their use of new technologies.
Salisbury, Bosanquet et al. 1998 [26]	Audits of implementation of 3 key prescribing changes in 39 randomly selected practices Kirtan Adaption-Innovation inventory (KAI) for 184 GPs	Stroke prophylaxis ACE inhibitors Trimethoprim	Southern England, UK Primary care	GPs Medical /pharmaceutical advisers Patients Practice nurses Pharmaceutical company reps Hospital consultants	Practice characteristics: size; fundholding status; training status; number of partners; computer usage; team meetings Protocols/ guidelines	Not addressed	Considerable variability between practices in terms of their implementation scores. GPs were inclined to an adaptive, cautious approach; the presence of more innovative partners in a practice explained 16% of the variance in implementation. No other factor was significantly associated with the implementation score.
Stark et al. 2000 [18]	Longitudinal analysis (4 years) of prescribing volume and cost	Anti-psychotic medicines: risperidone sertindole olanzapine clozapine quetiapine	Scotland, UK Primary care	GPs Hospital consultants	Effectiveness and side effect profile associated with older treatments	Side effect profile Effectiveness evidence	Prescriptions for anti-psychotic medicines rose 28% over 4-year period, but costs rose 155%. 90% of this cost increase accounted for by use of 5 atypical anti-psychotics. Most of these prescriptions are likely to be initiated in secondary care.
Stocking, 1992 [30]	Review / think piece	Equipment Procedures	England, UK	Department of Health Chief Medical	Budgetary constraints Medicines Control		There are no regulations concerning introduction and use of new equipment in the UK. Clinical and cost effectiveness

Table A1.1: Factors affecting the uptake of new technologies in primary care in the UK

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
		Drugs		Officer	Agency Committee on the Safety of Medicines Contracts		<p>rarely assessed.</p> <p>Diffusion of new procedures and services ranges from well-planned to haphazard. Major new technologies receive ringfenced funding from Department of Health. Much scope for variation in clinical practice.</p> <p>Introduction of drugs is highly regulated, both for licensing and in clinical practice.</p> <p>Despite the lack of controls, the tight budgetary situation has meant diffusion of medical technology is relatively slow in UK.</p>

Table A1.2: Factors affecting the uptake of new technologies outside the UK or in secondary care settings

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
Anon, 1998 [58]	Interview with Chief Executive of a mental health NHS trust	Atypical antipsychotics Antidepressants Alzheimer's medicines	Newcastle upon Tyne, UK Secondary care	Psychiatrists Patients Mentors Trust chief executive	Disease characteristics Guidelines Committee for approval of new medicines	Effectiveness	"Helping doctors succeed (in making patients better) is my primary purpose as a manager, not to be a budget watcher."
Bassett, Iyer et al. 2000 [40]	Case studies	Electronic foetal monitoring (EFM)	British Columbia, Canada Secondary care (Obstetrics)	Foetuses Pregnant women Midwives Hospital doctors	Private vs. public information Guidelines / protocols (encouraging active management) Political and social influences	No evidence of benefit to patients (foetal or maternal) Societal interests in technology	Rapid diffusion from high- to low-risk care (i.e. standard care) reflects a medical model suited to graphic EFM records.
Booth-Clibborn, Packer et al. 2000 [12]	Longitudinal analysis (3 years) of prescribing data and questionnaire surveys of 13 acute hospital pharmacies, 4 cardiology departments and 19 radiology departments	Statins Coronary stents MRI scanners	West Midlands, UK Secondary care (acute hospital NHS trusts)	Opinion leaders Manufacturers Patients Purchasers	Guidelines (local/national) Clinical trials	Cost	Statins and coronary stents diffused much more rapidly than MRI scanners (8/19 hospitals had these). Main influences on adoption for statins were high purchasing cost (inverse relation) marketing activities by companies (positive association). For stents, main influences were local guidelines and an opinion leader. For MRI scanners, high cost was main deterrent.

Table A1.2: Factors affecting the uptake of new technologies outside the UK or in secondary care settings

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
Ferlie, Fitzgerald et al. 2000 [13]	Case study (using interviews)	Low weight heparin and elective orthopaedic surgery Changing childbirth management Minimal access surgery for inguinal hernia	North Thames, UK Secondary care	Local opinion leader GPs Managers	Funding uncertainty Medico-legal uncertainty Primary/secondary care boundaries	Evidence base	A weak link between evidence base and uptake, with professional boundaries limiting the flow of knowledge between settings. Different practitioners used different hierarchies of evidence. NHS management played a limited role in enabling clinical change. Little evidence of purchasers forcing change through contracts. Role changes proved complex to negotiate.
Freed, Clark et al. 1997 [41]	Questionnaire survey	Combined DTP-Hib vaccine	Texas, North Carolina, US Primary care (ambulatory clinic)	Paediatricians Family physicians State	Payer mix (proportion of Medicaid patients associated with lower uptake in specialists; no association with generalists) Practice setting (more providers associated with higher adoption rates)	Cost (combined vaccine cheaper than separate vaccines)	Early adoption was not uniform among physicians and was associated with speciality (specialists more likely to adopt than generalists), speciality society membership, practice ownership, practice size and proportion of Medicaid patients.
Griffin & Griffin, 1993 [47]	Review of prescribing of new medicines in Europe	New medicines	UK; other European countries Primary and secondary care	GPs Pharmaceutical industry Government	Pressure to prescribe generically Constraints on advertising	Cost-effectiveness	The prescribing of medicines in the UK has become increasingly conservative, relative to other European countries. Main causes are financial and regulatory pressures. This trend is in the interests of neither

Table A1.2: Factors affecting the uptake of new technologies outside the UK or in secondary care settings

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
				Patients	Budgetary constraint Price/profit regulation		patients nor the economy.
Jones et al, 2001 [15]	Interviews with 50 GPs and 38 hospital consultants Longitudinal analysis (2¾ years) of GP prescribing data	New/newly prescribed drugs, including a list of 8 (1 PPI; 3 SSRIs; 1 ACE inhibitor; 1 potassium channel activator; 1 biphosphonate; 1 beta adrenoceptor stimulant)	Birmingham, UK Primary and secondary care	GPs Hospital consultants Pharmaceutical company reps	Education (literature, meetings) Effectiveness and side-effect profile in alternative pharmaceuticals Availability of alternative pharmaceuticals	Therapeutic value Cost Side effect profile Interactions with other drugs Dose (once daily vs. twice daily) Safety	Consultants did not report 'use' of a new drug, unless use was regular. Consultants often aware of new drugs before their launch; sources included pharmaceutical reps, scientific literature, meetings and colleagues. Willingness to prescribe varied with perceived risk for both consultants and GPs. Cost generally secondary to other considerations, e.g. effectiveness and tolerability.
Melzer 1998 [14]	Review / think piece	Anticholinesterases for Alzheimer's disease	UK, other European countries, US Primary and secondary care	NICE Patients / carers Manufacturers Professional bodies Funding bodies Media	Prevalence of disorder Aging population Access to institutional care Availability of information / evidence	Perceived and actual benefits	Improved regulation of new technologies requires examination and debate of the relevant evidence. Overvaluing new technology may threaten funding for vital, but more mundane care.
Peay & Peay 1994 [43]	Interviews	High risk medicines	'Major city', Australia	Specialists	Medical communication networks	Risk	Contact with colleagues – as information source or as information seeker – were

Table A1.2: Factors affecting the uptake of new technologies outside the UK or in secondary care settings

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
			Secondary care		Research environment Information sources		predictors of general innovative behaviour, but not of early use. Early use of high risk medicines is predicted by preparedness to prescribe and the presentation of particular circumstances which are appropriate for its use.
Robert, Stevens et al. 1999 [11]	Review of methods for early detection of new technologies	Computerised tomography scanners (head) Left ventricular assist devices Paediatric intensive care units Laparoscopic cholecystectomy	UK Secondary care	Hospital consultants Patient interest groups Electronics companies Department of Health Expert groups Media	Dissemination of evidence: journal publications, conference proceedings Technological development (electronics, mathematics etc) Technological and professional networks	Cost-effectiveness and adverse event profiles Evolution of products Number and type of competitor products	Development of innovative devices is often dependent on developments in other fields (such as electronics). Inexpensive techniques may be championed in non-teaching centres.
Rosen & Mays 1998 [42], Rosen 2000 [59]	Review Case studies using semi-structured interviews	Vascular stents for treatment of blocked blood vessels Triple test for detection of Down's syndrome Excimer lasers for treatment of optical	UK (9 sites, location not reported) Secondary care (NHS acute hospitals)	"Providers" (hospital consultants; hospital managers) "Purchasers" (HAs: public health doctors;	Directives (laws, regulations, planning systems; contracts) Incentives (budgetary controls, charges, subsidies) Purchaser-provider split	Evidence of effectiveness Cost	Purchasers' chief concern was the immediate financial integrity of the hospital. They had limited control over diffusion, because they lacked the resources to engage in intensive negotiation with providers. Clinicians were the main advocates for technologies, influenced chiefly by findings

Table A1.2: Factors affecting the uptake of new technologies outside the UK or in secondary care settings

Study	Type of study	Technology	Setting	Determinants considered			Key findings
				Actors	Environmental / structural	Product characteristics	
		disorders		contract managers)			from early observational studies.
Steffensen, Sorensen et al. 1999 [44]	Longitudinal analysis (4 years) of drug diffusion time, by practice population and GP characteristics	5 new medicines: sumatriptan (anti-migraine) finasteride (benign prostatic hyperplasia) tramadol (analgesic) clarithromycin (macrolide) azithromycin (macrolide)	North Jutland, Denmark Primary care	GPs	Practice characteristics: single-handed or partnership practice; gender ratio; number of consultations; number of home visits; number of laboratory tests or diagnostic procedures	Prescription only medicines, new compounds	All 5 medicines adopted more quickly in partnership practices than in single-handed practices. Number of prescriptions per patient for other medicines inversely associated with late prescribing for all new medicines except finasteride. Although late prescribers shared some common characteristics, the study did not support theoretical GP adopter categories.

Appendix 2: Interviews with PCT Prescribing Leads

A2.1 Background and Method

Qualitative interviews were undertaken with 20 GPs acting as prescribing leads for PCTs, in order to find out how additional NHS funding is affecting the uptake of new technologies in primary care. The views of PCT prescribing leads were sought as a readily identifiable group of GPs who can be expected to know about PCT policies and concerns. As actively practising GPs they have a relevant view on the uptake of new technologies in primary health care including, but not limited to, prescription medicines.

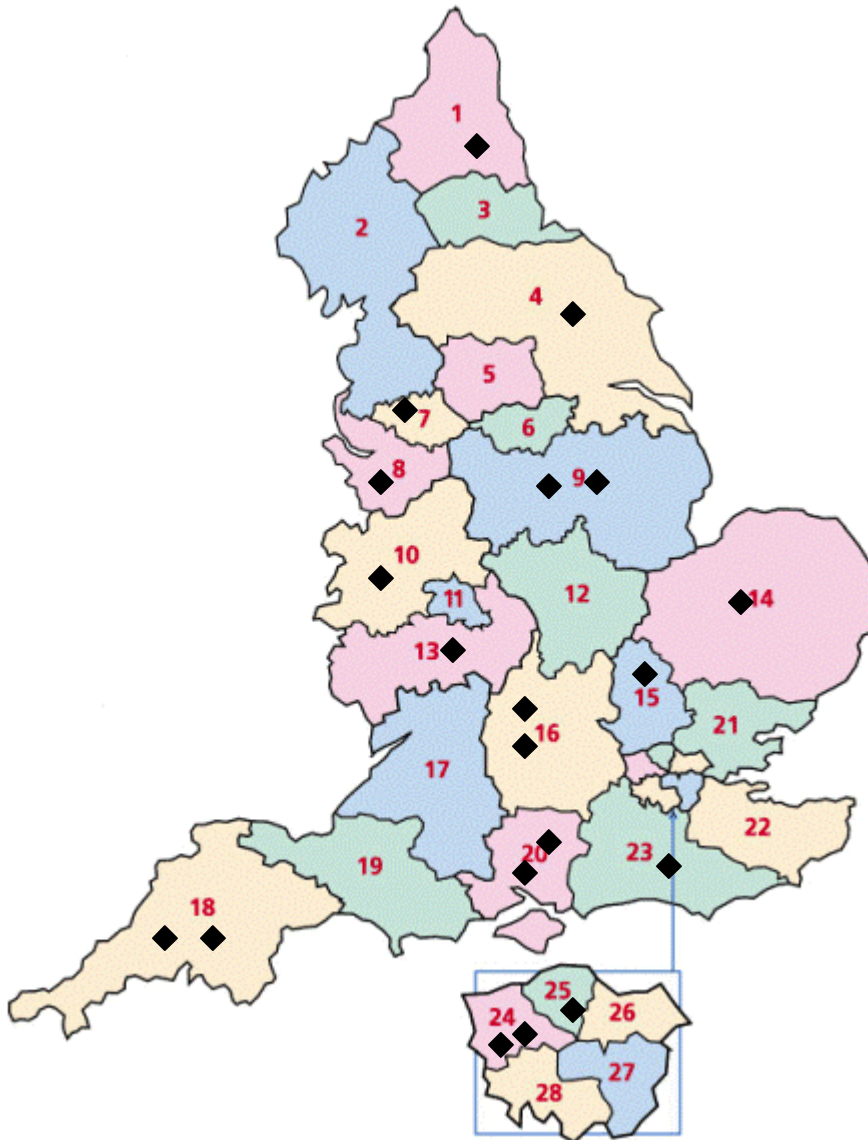
A common list of seven questions – the ‘topic guide’ – formed the structural basis of each interview. The questions covered issues such as whether or not additional funding had reached the PCT; the types of new technologies that had been developed; the reasons why these innovations had been pursued; and the promotional methods employed. Where the uptake of new technologies had been discouraged by the PCT, the types of technologies and reasons for the PCT’s decision were sought. Lastly, the prescribing leads were asked to give examples of good practice of innovation within their PCT. (A copy of the ‘topic guide’ is reproduced in Annex 2.1 to this appendix).

Initially, addresses for 32 PCT prescribing leads were obtained from responses to the MANMED survey conducted by OHE and CHE in 2001 (Mason et al. 2002). A letter was sent to each of the prescribing leads, thanking them for participating in the MANMED survey, enclosing a copy of the final MANMED report and requesting their assistance with the current project. Follow-up calls were made over the next few weeks, to find out whether the leads were interesting in participating. When the prescribing leads consented to participate, a convenient time and date was arranged. A further letter was then sent, specifying the arrangements made and enclosing a copy of the ‘topic guide’ detailing the questions to be covered in the interview.

This initial stage yielded 15 interviewees. The predominant reason offered for declining to be interviewed was that the GP was no longer the prescribing lead for the local PCT (16/32). In order to increase the sample to around 20, a further 12 PCTs were identified by random selection from within the total of PCTs in those regions of the country that were underrepresented by the initial group of interviewees. This second stage yielded a further five interviews, taking the total to 20. The overall response rate was 20 interviews from 44 approaches (45%).

The geographical distribution of the 20 interviews is widespread, as is shown by Figure A2.1. There is no apparent geographical or urban/rural bias.

Figure A2.1: Location of PCT Prescribing Lead Interviewees, by Strategic Health Authority Area (number of symbols indicates number of interviewees in each area)



Key to Strategic Health Authorities:

- | | | |
|---|--------------------------------|--------------------------------|
| 1. Northumberland, Tyne & Wear | 2. Cumbria & Lancs | 3. County Durham & Tees Valley |
| 4. N & E Yorks & Northern Lincs | 5. W Yorks | 6. S Yorks |
| 7. Greater Manchester | 8. Cheshire & Merseyside | 9. Trent |
| 10. Shropshire & Staffs | 11. Birmingham & Black Country | 12. Leics, Northants & Rutland |
| 13. Coventry, Warwickshire, Herefordshire & Worcs | 14. Norfolk, Suffolk & Cambs | 17. Avon, Gloucs & Wilts |
| 15. Beds & Herts | 16. Thames Valley | 20. Hants & Isle of Wight |
| 18. SW Peninsula | 19. Dorset & Somerset | 21. Essex |
| 24. NW London | 25. N Central London | 26. NE London |
| 27. SE London | 28. SW London | |

The interviews took place over a seven-week period from the beginning of January 2003. Each interview was conducted by telephone, at a pre-arranged time, by a member of the review team¹⁴ and typically lasted 20-30 minutes. All interviews covered the same set of questions, as specified in the 'topic guide'. Interviewees were asked open questions so as to give them the opportunity to express their views in their own words and according to their own priorities. This means that although some counting of numbers of similar responses is possible for certain questions, the information provided by the interviews is primarily qualitative. Furthermore if, say, five of the 20 GPs interviewed are recorded as having made a specific point, this should not be interpreted as meaning that the other 15 either disagree with that point or consider it unimportant.

A second round of interviews was conducted during the first three weeks of May 2003. The reason for the second interviews was the announcement in February of a proposed new GMS contract governing how PCTs would pay their local GP practices. Even if the contract is not ultimately accepted by GPs, and this remains a possibility, some of its elements may find their way into future arrangements. The proposed contract contains elements that would, if introduced, be fundamentally different in several ways from how GPs have been remunerated hitherto. In the context of the present study there are two elements of the proposed contract that are of particular interest:

- the 'quality framework' would award practices additional money for achievement of a wide range of quality standards specified in the contract, e.g. increasing 'the percentage of patients with a history of myocardial infarction who are currently treated with an ACE inhibitor'. Section 5 of the main report provides more details. But, by default, provision of services and use of technologies not specifically included would not be incentivised in any way;
- GP practices would be required to provide 'essential services'. They would also be expected to provide 'additional services', unless they have a particular reason for opting out. But practices would also have the option of negotiating with their local PCT to be funded to provide 'enhanced services'. Some of these enhanced services would have national specifications set for them but others may be developed according to local priorities.

We re-contacted the 20 PCT prescribing leads who had taken part in the initial interviews to seek their views on the impact that the proposed new GMS contract would be expected to have were it, or these elements of it, to be implemented. Of the 20, 17 were available to be re-interviewed, two were non-contactable despite repeated attempts and one declined to be interviewed again. Those who were willing to be interviewed were sent the four questions as set out in Annex 2.2.

¹⁴ Ten of the interviews were conducted by Anne Mason and 10 by Clive Pritchard. The interviewers agreed approaches at the outset and subsequently compared notes of their findings.

A2.2 Findings

Impact of additional funding

The unprecedentedly large increases in NHS funding in 2001/02 and 2002/03 are facts. The money has been, or is being, spent. One aim of this study is to get an early view of how much of it is being turned into more and/or better primary health care. The interviews with PCT prescribing leads sought those GPs' perceptions of what difference the extra money was making to primary care in their area, and particularly to the uptake of innovative medicines and other new technologies.

The overwhelming response was that extra money was of course welcome but that none, or hardly any, of it was available for discretionary development of new services by GPs or for introduction of new medicines unless mandated by NICE guidance or National Service Frameworks. Fifteen (75%) of the GPs interviewed said that despite the overall NHS funding increases, they still had no funds available for local initiatives.

The destination most often mentioned (by 14/20) for much of the extra resources was secondary care, especially to pay off accumulated debts (specifically mentioned by 6/20). The cost of complying with National Service Frameworks, and especially that for coronary heart disease, was specifically cited by 6/20 interviewees.

Spending on GP prescribing was generally reported as increasing rapidly, and often more rapidly than prescribing budgets. Eleven said that their PCT's 2002/03 prescribing budget would be overspent; one said that it would be underspent.

Investment in new primary care technologies

Interviewees were asked if they could think of specific technologies in primary care that in their PCT area had either been invested in for the first time in the last two years – i.e. since the large increases in total NHS funding had started – or on which they had significantly increased expenditure.

Investments in information technology in primary care were cited by half of the respondents (10/20). Within this heading, more specific examples included electronic patient booking systems (3) and electronic links for pathology and x-ray results (3).

Otherwise, the most frequently mentioned specific examples were technologies required by National Service Frameworks and NICE guidance:

- increased expenditure on statins, as implied by the coronary heart disease National Service Framework, was mentioned by all but two prescribing leads (18/20);
- increased spend on atypical anti-psychotics, in line with NICE guidance, was mentioned by 11/20;
- Alzheimer’s medicines, a subject of NICE guidance, were mentioned by 4/20;
- diabetes medicines, affected both by NICE guidance and a National Service Framework, were mentioned by 4/20; and
- nicotine replacement therapy (NICE guidance) was mentioned by 3/20.

Three interviewees referred to the need to invest to achieve the government-set targets for primary care access (an appointment with a GP within 48 hours of calling). A range of other examples of improving patient access both within primary care and to secondary care services were mentioned by one or two of the GPs interviewed. Other new services mentioned included introducing a smoking cessation service, and a counselling service provided by psychologists.

Main influences

Overall, the large majority of respondents were able to think of examples of new investments and/or significant service expansions in primary care (18/20). Mostly these were responses to central requirements and not local initiatives.

All but two prescribing leads made it clear that National Service Frameworks were followed in primary care in their PCT. One made no mention of the role of National Service Frameworks, and the remaining interviewee dismissed National Service Frameworks as merely “tick boxes” that can improve patient care only if properly resourced.

The same GP was of the opinion that “most GPs put NICE [guidance] on the shelf”. Three other interviewees made no mention of NICE guidance as driving new or increased primary care expenditures. The other 16/20 prescribing leads, however, made explicit mention of NICE guidance as a driver.

The local PCT or its predecessor Health Authority (HA) was cited as influencing new or increased primary care expenditures on specific technologies by 7/20 respondents. A slightly smaller number, 6/20, cited secondary care as an influence. Individual GPs were mentioned twice as the main influence for an investment/expansion. The national NHS Information Strategy was credited once.

PCT methods to encourage uptake of new primary care technologies

Numerous different, financial and non-financial, measures were mentioned by the PCT prescribing leads interviewed. But for the large majority of the new investments/expansion examples highlighted no explicit method of encouraging uptake was cited. This does not necessarily mean that, in those cases, no incentives exist, only that the respondent did not identify any. In some cases, such as being able to receive pathology or x-ray results electronically rather than on paper, there was no need to offer further encouragement beyond the service itself.

It is a legal requirement for all PCTs to have and to operate a prescribing incentive scheme in which all GP practices must participate. The MANMED survey of primary care organisation (PCO) prescribing leads and prescribing advisers (and hospital chief pharmacists) undertaken in mid-2001 looked at the nature of the prescribing incentive schemes in place. This is written up in detail in Mason et al. 2002. That survey found wide variations between different PCOs' schemes in the therapeutic areas covered, and the mix of financial and non-financial targets included in the schemes.

Prescribing incentive schemes were mentioned by just five of the 20 prescribing leads we interviewed. One of these five also referred to a scheme, outside the terms of the national General Medical Services contract, to pay GPs for each patient they reviewed for statin prescribing for primary prevention. One of the non-medicine technologies – electronic sphygmomanometers – was distributed free to GPs by the PCT, funded by a successful bid for central NHS funds for that purpose. Two other interviewees referred to the policy of PCTs reimbursing GPs for 50% of the cost of specified items of IT.

The range of other, non-financial, means of encouragement mentioned included: meetings with and presentations to GPs (mentioned by 5/20); letters and newsletters to GPs (3/20); clinical governance audits of compliance with National Service Frameworks and NICE guidance (1/20); and a newsletter to patients to raise awareness of nicotine replacement therapy (1/20). On the negative side, one interviewee suggested that “GPs are used to ignoring PCT targets because they are perceived as unrealistic”.

Primary care technologies not introduced

The number of examples given by interviewees of primary care technologies considered but rejected, deliberately delayed or only partially implemented by PCTs, was much smaller than the number of examples cited of new investments or significantly expanded spends.

This observation should be seen, however, in the context of 75% of respondents having expressed the view that there was no money available for discretionary local developments. Such an environment may discourage innovative thoughts by GPs

well before they get to the stage of explicit consideration if they are likely to require additional resources even if only in the short-term. In addition, any attempted ban on a particular health service or product might well be challenged in the courts. Some of the prescribing leads interviewed spoke of local prioritisation committees which consider new treatments and review individual, exceptional, cases. The general approach seemed to be to raise awareness and encourage rational and appropriate care, rather than attempting to ban particular technologies. One PCT routinely informed GPs about new drugs and advised them to wait for guidance before initiating prescribing.

Quite often, respondents referred to restrictions they knew of on elements of secondary care – such as cosmetic surgery and assisted conception – but examples from primary care were not mentioned with great frequency. Then again, only three of the 20 GPs interviewed stated that they were aware of no specific examples of primary care technologies that had been rejected or actively discouraged.

Electronic booking systems were mentioned as having been considered but rejected in two PCTs. Another PCT had rejected electronic transmission of test results from hospitals to GPs; and another had rejected electronic prescribing links between GPs and local pharmacies. Delays to IT improvements were mentioned in two other cases.

Two prescribing leads said that attempts were made to restrict the growth in prescribing of Cox II inhibitors. Two rejections of tiotropium for COPD were noted, although it was hospital consultants who had requested the medicine. But no other specific rejection or restriction examples of primary care medicines or non-medicine technologies were raised by more than one interviewee.

Main reasons for low uptake

Insufficient funding was the overwhelming reason offered for lack of uptake by PCTs of new primary care technologies, other than those which are centrally mandated by the Department of Health and NICE. Seventy-five per cent of respondents (15/20) gave this as a reason.

A local PCT view that a technology was insufficiently justified by the available evidence on effectiveness (tiotropium for COPD in one PCT, electronic booking for patients in another) or cost-effectiveness (photodynamic therapy for wet macular degeneration, in a third PCT), was given by one interviewee in each case. PCT concerns about “inappropriate” prescribing were the reason given by two prescribing leads for trying to restrict the growth in prescribing of Cox II inhibitors in those places.

A lack of initiative by the PCT’s management, lack of local IT expertise, the conservatism of local GPs, and lack of interest by secondary care NHS Trusts (in the case of electronic transmission of pathology and x-ray results), were each offered

once, by different interviewees, as reasons for lack of uptake of particular new technologies in primary care.

Other comments

We also asked the GP prescribing leads if they knew of any particular examples of good practice in the implementation of new primary care technologies, or if they would like to make any general comments. Thirteen of the 20 interviewees offered examples of what they considered to be good practice, but they generally referred to new technologies implemented by their own PCTs, as already described above.

A range of more general comments was made, by 12/20 prescribing leads, covering topics as diverse as the roles of PCTs and GPs and complaints about excessive paperwork. A few comments were made about NHS funding and its impact on primary care. The only type of comment made by more than one respondent was a view that funding, although increasing for the NHS as a whole, is still not reaching primary care in sufficient quantities. Four prescribing leads made that point. However, a different perspective was provided by one interviewee who said that hassles were mainly with the primary/secondary care interface rather than funding problems in their PCT area.

Potential impact of the proposed new GMS contract

In the second round of interviews in May 2003, 17 of the 20 PCT prescribing leads originally interviewed in January/February 2003 were available to give their views on the impact of the proposed new GMS contract were it to be implemented.

The great majority of the respondents, 15/17, expressed the view that the contract would cause GPs to increase activity in the areas specified in the quality framework, i.e. those for which financial incentives would be provided. Increased provision of diagnostic testing – including endoscopy – was specifically mentioned by five respondents, which was more often than any other type of technology.

Twelve of the 17 thought that technologies not explicitly incentivised would be considered by GPs to be lower priority activities and so would be likely to receive comparatively less attention. That problem would be worse the tighter was PCT funding. Two respondents thought that uptake of non-specified technologies would not be affected either way. Two thought that by encouraging GPs to question their ways of working, the proposed contract would encourage greater uptake of new technologies in primary care, even if not specified in the quality framework.

The option for GPs to negotiate with their local PCT to provide ‘enhanced services’ was expected by 6/17 respondents to have a possibly significant impact on take-up of new primary health care technologies. The other 11 respondents considered that some impact was either possible or probable but that it would only be small. Concerns over

the availability of PCT funds to devote to enhanced services in practice were voiced by six of these 11.

No other individual elements of the proposed GMS contract were identified as likely significantly to affect uptake of new technologies. The general thrust of the contract towards greater patient data collection, monitoring and audit was thought by 5/17 to require more and better IT in primary care. Three of the 17 respondents thought that by raising the quality issue so clearly, the proposed contract should lead to better quality and more use of new technologies in primary care.

Annex 2.1: Topic Guide for PCT Prescribing Lead Interviews

<p><i>When we talk about 'new technologies' in primary care, we are referring to new medicines, information technology, diagnostic aids, etc.</i></p>	
<p>1. Additional funding</p>	<p>In the April 2002 Budget, the Government announced a large amount of additional funding for the NHS as a whole, commencing in 2002/03. This followed a large increase in total NHS funding in 2001/02. What difference has this extra funding made to PCT expenditure on new technologies in primary care, including medicines?</p>
<p>2. Specific new technologies</p>	<p>Can you give me some examples of specific new technologies that have been introduced, or on which expenditure has been much expanded, in your PCT in the last two years?</p>
<p>3. Main influences</p>	<p>Thinking about those specific examples, can you briefly describe who decided and why the technologies were introduced/expanded? In other words, what were the main influences?</p>
<p>4. Methods used to encourage uptake</p>	<p>Were there any particular methods that the PCT used to encourage their uptake?</p>
<p>5. Technologies not introduced</p>	<p>Are there any examples of specific new technologies that you know of that were <i>not</i> introduced or were particularly restricted by the PCT?</p>
<p>6. Reasons for lack of uptake</p>	<p>Do you know why the PCT didn't introduce these new technologies?</p>
<p>7. Good practice and local contacts</p>	<p>In the course of your work, have you seen/heard/read about any particular example of good practice in the implementation of new technologies? Do you know if the project/service has been evaluated in any way (e.g. audit)? Please could you provide us with contact information for the project/service?</p>
<p>8. Any other comments?</p>	

Annex 2.2: Second Round of Questions for PCT Prescribing Leads, Concerning the Proposed New GMS Contract

Notes:

- When we talk about ‘new technologies’ in primary care, we are referring to new medicines, information technology, diagnostic aids, etc.
- Assume that the proposed new GMS contract or something similar to it is implemented.

1. The quality framework awards practices additional money for achievement of quality standards specified in the contract, e.g. increasing ‘the percentage of patients with a history of myocardial infarction who are currently treated with an ACE inhibitor’. What impact do you think these ‘quality payments’ will have on GPs’ use, in your local area, of technologies specified in the quality framework?

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2. What will be the effect on use of technologies that are not specified in the contract?

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3. GP practices will be required to provide ‘essential services’. They will also be expected to provide ‘additional services’, unless they have a particular reason for opting out. But practices will also have the option of negotiating with their local PCT to be funded to provide ‘enhanced services’. Some of these enhanced services will have national specifications set for them but others may be developed according to local priorities. What impact do you think this will have on use of new medicines and take-up of other new technologies in primary care, compared with the current situation?

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4. Do you think any other aspects of the proposed new GMS contract will affect take-up of new technologies in primary health care? Which aspects of the contract? Having what effect?

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AIMS

The American Pharmaceutical Group (APG) was set up in 1985 to improve understanding of the industry, and of the health care contribution of the US companies in particular, among Government, Parliament and interested stakeholders. Its aims include:

- Ensuring an overriding commitment to better patient care and information
- Maintaining a reputation and standing as a high quality, responsible and well-informed Group, so that it makes a constructive contribution to health care policy and debate
- Providing information from, and direct access to, its parent companies
- Advising how the UK can attract inward investment from the US, especially as APG members account for more inward investment than any other national pharmaceutical group
- Taking a lead role on policy issues affecting health care and pharmaceuticals, such as patient empowerment and greater competition
- Inputting APG views to national organisations such as the Association of the British Pharmaceutical Industry and the Ministerial Industry Strategy Group.

FACTS ABOUT THE APG

The APG represents 11 companies which together contribute more than a third, by value, of the medicines supplied to the NHS. The member companies:

- Provide NHS patients with medicines worth £2.5 billion a year
- Export over £1 billion of prescription medicines annually
- Employ 15,000 people, including 2,000 in research and development
- Make capital investments of some £700 million a year.

The member companies are: Abbott Laboratories; Amgen; Bristol Myers Squibb; Janssen-Cilag; Lilly; Merck Sharp and Dohme; Ortho Biotech; Pfizer; Procter and Gamble Pharmaceuticals; Schering-Plough; and Wyeth Pharmaceuticals.