The outcomes of health care commissioning by English Primary Care Trusts 2008-10

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CONTENTS

SUMMARY

Background: In 2006 the Department of Health set out a framework to strengthen health care commissioning in order to drive health reform, improve health, improve health care, and improve the financial health of the NHS. The Health Reform Evaluation Programme made a call for research to explore the commissioning processes within primary care trusts (PCTs) and the relationship between these processes and health outcomes.

Aim: To identify the extent to which commissioning investments achieved their expected outcomes, and the commissioning processes related to achieving successful outcomes.

Setting: All 152 PCTs in England at the time of the study.

Design: Controlled before and after study of marginal commissioning investments made in 2008/9 and 2009/10 for four conditions/services: diabetes, chronic obstructive pulmonary disease (COPD), coronary heart disease (CHD) and emergency and urgent care.

Methods: National surveys of PCT commissioning managers were undertaken in 2009 and 2010 to identify the largest commissioning investments starting in the four conditions/services in each PCT in 2008/9 and 2009/10, and the commissioning processes used to develop these investments. Routinely available data on outcomes expected from these investments over the period 2007/8 to 2010/11 was collated. For each of the four conditions/services, an analysis was undertaken to determine whether the change in reported investment was associated with change in expected outcomes. The effect of different reported approaches to commissioning was assessed for successful investments, and the cost-effectiveness modelled.

Findings:

- 51% (77/152) of PCTs agreed to participate in the survey in 2009 and 60% (91/152) in 2010.
- Around half of PCTs reported making marginal investments in each condition/service each year, with a mean reported marginal investment of £277 000 for diabetes, £180 000 for COPD, £456 000 for CHD, and £653 000 for emergency and urgent care per PCT in 2008/9.
- Commissioners expected their marginal investments to achieve improvements in service quality and responsiveness, health, health inequalities and financial balance. However, a limited number of outcomes were tested here due to lack of available routine data on outcomes, and the expectation that some outcomes would only be achieved in the longer term (beyond the endpoint of our study).
- There was no evidence that reported marginal investments reduced emergency admission rates for the four conditions/services. There was evidence of an improvement in good blood glucose management for diabetes, with an increase of half a percentage point in the percentage of the population achieving HbA1c <7 for every extra £10 spent per person with diabetes in the PCT per year. This analysis was compromised by a change in how the outcome was measured in different years. There was no evidence of any other effect on health outcomes.
- The presence or absence of particular reported commissioning processes (e.g. clinical or patient involvement) was not associated with achieving improvements in blood glucose management.
- The mean cost-effectiveness ratio for the diabetes investments was £217 300 per QALY, well above a cost-effectiveness threshold of £20,000.

Conclusions: Commissioners made investments with the aim of improving a wide range of outcomes. There is limited consistently measured routine data relevant to these outcomes. We found little or no impact on the outcomes we could measure. Commissioners were attempting to impact on outcomes, particularly reducing emergency admissions, where there is a lack of evidence-based interventions.

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ABBREVIATIONS

CHD	Coronary Heart Disease
COPD	Chronic Obstructive Pulmonary Disease
CCG	Clinical Commissioning Group
ED	Emergency Department
EUC	Emergency and Urgent Care
FESC	Framework for procuring External Support for Commissioners
GP	General Practitioner
HES	Hospital Episode Statistics
IP	Inpatient
LA	Local Authority
OP	Outpatient
PBC	Practice-based Commissioning
PCT	Primary Care Trust
PPI	Public and Patient Involvement
QOF	Quality Outcomes Framework
SHA	Strategic Health Authority

1. BACKGROUND

1.1 Commissioning health care in England

The term ‘commissioning’ is used in the National Health Service (NHS) in England to describe a wide range of activities such as assessing needs, allocating resources to best meet those needs, establishing contractual arrangements with service providers, and monitoring outcomes (Lewis et al, 2009). It is distinguished from the purchasing of health care by its proactive and strategic intent (Smith & Curry, 2011). Commissioning health care in England occurs at different levels, from an individual perspective of using personal budgets through to a regional or national perspective of commissioning specialised hospital services (Smith et al, 2004). A large amount of commissioning occurs at a local level by groups acting on behalf of local populations. Between 2006 and 2013 this local commissioning was undertaken by 152 Primary Care Trusts (PCTs) in conjunction with practice-based commissioners from primary care, replaced by Clinical Commissioning Groups and a national NHS Commissioning Board from April 2013.

Our research study was funded in response to a call in 2007 from the Health Reform Evaluation Programme, a research group funded by the Department of Health in England. Research was required to understand the processes and outcomes of commissioning by PCTs and practice-based commissioning. The research brief included the following questions about the outcomes of commissioning: “What is the impact of commissioning on tackling inequalities and improving health outcomes” and “Overall which approaches to commissioning are more and which are less successful in delivering key health reform goals concerning service quality and responsiveness, financial balance, reduced health inequalities and population health and well-being.” Policy makers were interested in these questions because of the national financial investment in commissioning (in 2008/9, the management costs of PCTs, which do not reflect the full running costs, were £1.38 billion according to the NHS Finance, Performance and Operations, NHS Information and Accounts Audited Summarisation Schedules1996-7 to 2008/9) and the belief that health care commissioning in PCTs was in need of strengthening.

In 2006 the Department of Health set out a framework to strengthen health care commissioning in PCTs as a way of driving health reform, improving health, improving health care, and improving the financial health of the NHS (Department of Health, 2006). They identified a range of changes that commissioning should deliver, including changes in service provision, access to services, quality of services, efficiency, tailoring of services to a local population, and improved health. The Department of Health continued to build on this organisational policy of strengthening commissioning by promoting ‘world class commissioning’ to improve commissioning capability (Department of Health, 2007). They set out eleven competencies of commissioning organisations and created a reward scheme for those delivering quality commissioning (Department of Health, 2008). World class commissioning was promoted within PCTs between 2007 and 2010. At the same time, practice-based commissioning was in operation to promote primary care-based clinical leadership within commissioning (Department of Health, 2009). A further shift towards the clinical leadership of commissioning health care occurred with the announcement in 2010 of the proposed replacement of PCTs by ‘GP commissioning consortia’ as they were then called (Department of Health, 2010). The focus on the general practitioner as lead commissioner was later changed to include a range of clinicians and these groups were called Clinical Commissioning Groups (Department of Health, 2011).The policy interest in measuring commissioning outcomes continued, with the introduction of the NHS Outcomes Framework which presents a list of indicators by which the performance of commissioners will be judged (Department of Health, 2012a)

Over the course of the policy drive to strengthen and reform commissioning, resource allocation to PCTs increased in real terms year on year between 2006/7 and 2010/11 (webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Managingyourorganisation/Financeandplanning/Allocations/index.htm). In later years, the context turned from one of increasing resources to PCTs to one of austerity, with the need for all commissioners to limit spending.

1.2 Research evidence on outcomes of commissioning

Smith & Curry (2011) offer an excellent overview of the impact of recent commissioning reforms in England. They identify different ways of measuring the outcomes of commissioning reforms. The first involves international comparisons, or national comparisons over time, in the outcomes which policy makers expect commissioners to impact on, for example reductions in emergency admissions rates. These types of comparisons are affected by changes other than commissioning, for example changes in service providers and population demographics, which make it difficult to distinguish the effect of commissioning. The second approach involves localised or pilot versions of reforms which allow for comparison between different models of commissioning. Miller et al (2012) offer a comprehensive literature review of historical and recent *clinical* commissioning models which take this latter approach of evaluating pilot schemes.

Smith & Curry (2011) consider the evidence base relevant to PCTs and practice-based commissioning. They state that “there is relatively little robust research evidence about the performance of commissioning” (p35). They identify four dimensions of expected impact for PCTs and practice-based commissioning: equity, effectiveness, efficiency and responsiveness. For equity, they present some limited evidence to show that PCTs and practice-based commissioning are unlikely to have had an impact. They show that health inequalities have persisted nationally, the world class commissioning competency score addressing equity did not improve, and a targeted approach to health inequality by a sub-group of PCTs largely failed to narrow inequalities. For effectiveness, they show evidence of a limited effect on shifting services out of hospital but cite achievement of reductions in waiting times for treatment, procuring new services and securing financial balance after a deficit. They show how mixed the evidence of effectiveness is by describing successful initiatives and unsuccessful ones such as PCTs with referral management initiatives being no more likely to change outpatient referral rates than those without (Imison & Naylor, 2010). For efficiency, again they found few studies which quantified impact (Smith & Curry 2011). They cite evidence of variation in service use around the country as an indication of continuing inefficiency and Audit Commission reports showing avoidance of decommissioning which might facilitative efficiency. Further, they draw on national level data to show that increases in spending on community services were not matched by decreases in spending on secondary care, indicating no impact on efficiency. International comparisons show the NHS in a favourable light in terms of efficiency but this cannot be attributed to commissioning. For responsiveness of services to the needs of patients, any evidence presented related to processes rather than outcomes.

Miller et al (2012) conclude in their recent review that research evidence about the impact of clinical commissioning models is limited but is supportive of general practice engagement in commissioning leading to achievement in outcomes. They identified some evidence that GP fundholders reduced referrals to secondary care, although evidence was mixed; that Total Purchasing Projects had reduced occupied bed days for emergency admissions; that the considerable activity around improving access to secondary care and improving the quality of primary and community care had lacked rigorous evaluation; and that reductions in prescribing costs and wait for elective surgery and outpatients occurred.

As part of the world class commissioning assurance process, PCTs prioritised specific outcomes to progress. A report of the progress made by PCTs between 2007 and 2008 identified that PCTs which prioritised specific outcomes achieved more improvement in them than PCTs not prioritising them (MHP Mandate, 2010). Five indicators were measured including smoking quitters and breast screening coverage.

In conclusion, there is evidence that commissioning can have an impact on some outcomes. However, the inconsistency in the small body of existing evidence suggests that it cannot be assumed that commissioning will always lead to the anticipated changes in costs, service delivery or outcomes. An additional complexity is that the types of outcomes required of commissioning include potentially conflicting priorities. For example, commissioners may need to trade off improved efficiency for improved access or equity (Dolan et al, 2003). Examples of conflicting priorities are offered by Smith & Curry (2011).

1.3 Research evidence on commissioning processes related to outcomes

Beliefs about aspects of good quality commissioning, which policy makers hoped would result in better outcomes, were operationalized in the world class commissioning competencies (Department of Health, 2006). These were related to:

- Clinical leadership and engagement
- Patient and public engagement
- Commissioning based on evidence and needs assessment
- Leadership and management
- Collaborative working with communities
- Procurement skills

Smith & Curry (2011) explain the importance of the competencies identified above. They identify commissioners as having weak clinical leadership compared with service providers, needing patient and public involvement in order to be responsive to patient needs, lacking staff capability and capacity particularly in analysis of information, having an information asymmetry compared with service providers, and being unable to use external support effectively. Assessments of PCT commissioning have identified weaknesses in processes of commissioning: the Audit Commission scrutinised the progress PCTs had made towards practice-based commissioning and identified processes that were under-utilised such as engagement of public health staff or local authorities (Audit Commission, 2007). The importance of clinical engagement is supported by research evidence which shows that GP engagement in commissioning can lead to improved outcomes (Miller et al 2012). PCTs can commission in different ways (commissioning processes) and it is important to test their effect on outcomes because of the paucity of evidence linking processes with outcomes.

1.4 The use of routine data to measure outcomes

Some outcomes which PCTs wish to achieve relate to activities, for example a reduction in emergency admissions, whereas others relate to health, for example a reduction in heart disease in the population. Measuring the outcomes achieved by PCT commissioning requires the availability of routine data. Most routine data at PCT level relate to the measurement of activity or performance rather than health outcome. Key sources of relevant routine data are the Hospital Episode Statistics

(HES) for measuring hospital utilisation rates and outpatient attendance rates, and the Quality Outcomes Framework (QOF) for measuring performance in primary care. For example, a recent study of the effect of a financial incentive for hospitals to reduce mortality rates used HES inpatient data and showed a reduction in mortality (Sutton et al, 2012). A recent study of referral management schemes within PCTs used HES outpatient data to show that these schemes had no impact on referrals (Imison & Naylor, 2011). QOF is a source of indicators of quality of primary care but also include a few indicators relating directly to health outcomes (e.g. % of people meeting HbA1c targets). We were interested in it as a source of data on outcomes which commissioners attempt to effect rather than the quality of primary care.

Some researchers have considered the relationships between measures from these routine datasets and these relationships may help to shape or interpret any analysis of the separate measures. First, we cannot assume in our study that any impact of commissioning initiatives on quality of care will necessarily translate into improvements in health because concerns have been expressed about the disappointing level of correlation between health care performance indicators and health (Arah & Westert, 2005). Researchers have found no relationship between the introduction of payment for improvements in performance in primary care and clinical outcomes (Serumaga et al, 2011). In cross sectional studies, positive correlations have been identified between different indicators of healthcare performance rather than indicators of performance and health. Researchers have found correlations between the quality of management of diabetes and chronic obstructive pulmonary disease in PCTs using QOF data, and rates of emergency admissions (Calderon-Larranaga et al, 2011; Dusheiko et al, 2011; Downing et al, 2007), showing that better performance in primary care is associated with lower use of secondary care. In longitudinal analyses, improvement in the quality of diabetes management over time was associated with a reduction in emergency admissions (Dusheiko et al, 2011). This indicates a more causal relationship between primary care performance and emergency admissions. Therefore we might expect that commissioning initiatives aimed at improving the quality of primary care might also impact on reducing emergency admissions. Correlations have also been found between quality of primary care and patient satisfaction (Brown & Lilford, 2006). Finally, when considering change over time in outcome measures, research has identified potential confounding factors including rural/urban status of population and affluent/deprived status of population (Badrinath et al, 2006). In addition, changes in the quality of care for coronary heart disease in general practice occurred more in large practices and in affluent areas (Campbell et al, 2005). Therefore the effects of size of practices in PCTs, rural status of PCTs and deprivation of PCT populations will need to be taken into consideration in our study.

1.5 Definitions, focus and context of this study

The focus of our study was local commissioning. We studied PCT commissioning, with practice-based commissioning occurring within these PCTs and treated as a process of commissioning. We focused on one aspect of commissioning only: health care commissioners within PCTs make marginal changes each year with the expectation that these will affect outcomes such as improving the health of a patient group or reducing unnecessary attendance at secondary care. These marginal changes – which we call commissioning initiatives - may require financial investment, reconfiguration of services, or disinvestment to achieve desired outcomes. We focused on marginal changes because research has shown that this is what commissioners do in terms of priority setting and rationing, rather than engage in large strategic change (Robinson et al, 2012). We expected to see marginal investments improving outcomes.

Our study was undertaken between November 2008 and September 2012. During this period, there were 152 PCTs in England, a reduction from 303 in 2006. Although some PCTs were in deficit, the context was one of increasing resource allocation to PCTs. The context was also one of uncertainty

within PCTs because during our second survey of PCTs in 2010, the announcement of the proposed replacement of PCTs by GP commissioning consortia (as they were then called) was made.

1.6 Relevance of the study to Clinical Commissioning Groups (CCGs)

Our study evaluates the outcomes of initiatives commissioned by PCTs. Although the commissioning bodies change from April 2013, the evidence gained from studying the impact of commissioning will be valuable in informing the new commissioning arrangements nationally (the National Commissioning Board) and locally (CCGs, public health, local authorities). Our study can also offer recommendations about methodological issues when measuring outcomes of commissioning, set a benchmark for the size of change achieved by previous commissioning models, and identify commissioning processes associated with successful outcomes which CCGs might wish to pursue.

2. AIMS AND OVERVIEW OF METHODS

2.1 Aims and objectives

The focus of our study was on a key commissioning function of PCTs: making changes to improve the health of their populations. PCTs make marginal changes to the services they commission each year (which we term “commissioning initiatives”) with the expectation that these will affect outcomes such as improving the health of a patient group or reducing unnecessary attendance at secondary care. PCTs may reconfigure services or invest or disinvest money to achieve these outcomes. Our primary aim was to measure the outcomes of commissioning in three long term conditions and one service - diabetes, chronic obstructive airways disease (COPD), coronary heart disease (CHD) and emergency and urgent care. A secondary aim was to identify the key commissioning processes associated with successful outcomes. Our objectives were:

1. To identify the largest commissioning initiatives undertaken in all PCTs in England in four conditions/services in 2008/9 and 2009/10 using a national telephone survey of PCTs in 2009 and 2010.

2. To identify the commissioning processes and budget allocation for the identified initiatives using the two national telephone surveys of PCTs.

3. To identify changes in outcomes in PCTs associated with the introduction of new commissioning initiatives, measurable using routinely available data, over the time period 2007/8 to 2010/11.

4. To examine the relationship between commissioning processes and outcomes for the PCTs with initiatives, for each condition/service.

5. To identify the short term cost-effectiveness of commissioning initiatives in each of the four condition/services.

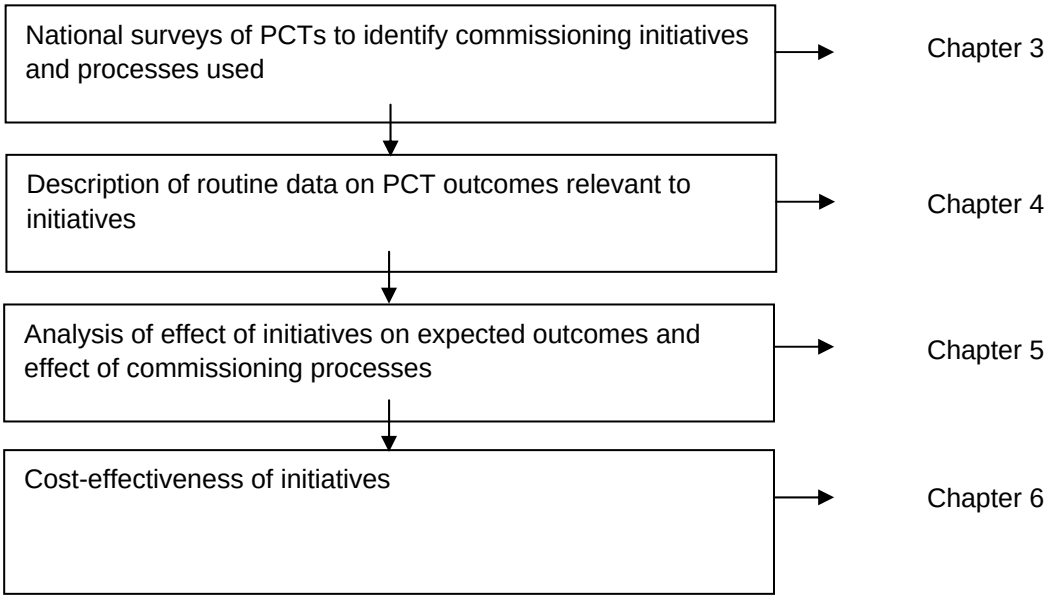
2.2 Design

The design was a controlled before and after study of commissioning in the 152 PCTs in operation in England when the study began in 2008. We identified the largest reported change made by PCT commissioners (commissioning initiative), in four tracker conditions/services, and used routine data to study the effect of these reported changes on key outcomes. The study had four components which we describe in different chapters of this report (Figure 2.1). We undertook national surveys of PCT commissioning managers in both 2009 and 2010 to collect information on commissioning initiatives and the processes used to commission them. We collated routinely available data on relevant outcomes over the period 2007/8 to 2010/11. We studied the change in these outcomes over time in PCTs with different sized investments, and the effect of processes used to commission the initiatives. As part of the surveys we gathered data on the size of investment made in the initiatives to consider the cost-effectiveness of investments which achieved outcomes. The surveys were undertaken by telephone using a structured questionnaire and were fully quantitative with no qualitative component.

2.3 Focus on four conditions and services

PCT commissioning is a large and complex process attempting to produce multiple outcomes. We focussed on specific conditions and services in this study, rather than commissioning as a whole, to allow us to explore the relationship between specific initiatives and specific outcomes. The research brief indicated that commissioning by both PCTs and practice-based commissioners was of interest. Therefore we selected three long term conditions which represented important health problems for which practice-based commissioners were known to be actively commissioning at the time of designing the study. These were diabetes, COPD and CHD. We selected a service as well as long term conditions because commissioners may commission with either a condition or a service focus. We selected emergency and urgent care because of policy interest in reducing unnecessary emergency admissions and our team's expertise in this area. These commissioning areas also collectively represent both a major burden of potentially preventable chronic and acute ill-health at population level and major areas of both primary and secondary care spending (Martin et al, 2008).

Figure 2.1 Components of the study



2.4 Collaboration within the Health Reform Evaluation Programme

This study was funded in conjunction with another within the Health Reform Evaluation Programme (Bate et al, 2011). It was agreed that we would undertake two telephone surveys of Directors of Commissioning in PCTs for the other study because this was an efficient use of resources within the programme. We completed the first survey by contributing to the design of the questionnaire, piloting the questionnaire, and completing the data collection of 67 structured telephone interviews. As agreed, we gave the data to the other project team for analysis and reporting. The second survey was not undertaken because the changing policy context led to a curtailment and refocus of that project as the PCTs they were aiming to undertake prospective in-depth research within were abolished. We returned 10% of the study funding to the funder at the end of our study because we had not completed this planned objective.

Dr Bate and colleagues submitted a final report of their study to the funders in April 2011 in which they reported the findings and conclusions of the survey (Bate et al, 2011). They reported the results of the survey in summary:

> "A total of 67 Directors of Commissioning (or equivalent senior posts) from across the 152 PCTs in England took part in the survey (response rate 44%). The study identified a number of key themes to enable effective commissioning which included aspects around: the role of national policy in incentivising effective commissioning; the need for robust and accessible information; adequate skill to analyse and interpret information; and the engagement and involvement of key stakeholder groups including clinicians at all levels, local authority and other local providers."

3. IDENTIFYING COMMISSIONING INITIATIVES AND PROCESSES: SURVEYS

3.1 Aims and objectives

The aim of the first part of this study was to identify the changes commissioners made to services within the four tracker conditions/services and the processes related to these changes. The objectives were to:

1. Identify the largest commissioning initiatives starting in all PCTs in England in each of four tracker conditions/services in 2008/9 and 2009/10.

2. Identify the commissioning processes, expected outcomes and budget allocation for the identified initiatives.

We added a third objective during the study:

3. To compare commissioning processes used in 2008/9 and 2009/10 to see if changes in commissioning processes occurred during a period of policy emphasis on improving the quality of commissioning.

3.2 Methods

We undertook a repeated cross sectional telephone survey of commissioning managers in 152 PCTs in England in 2009 and 2010. The survey was a structured questionnaire administered by telephone interview and did not include open questions to collect commissioners' views about commissioning or more in-depth insights about commissioning processes. We selected telephone rather than postal administration to ensure that commissioners understood the types of initiatives we were interested in. The term 'telephone interviews' is used in this chapter to refer to the administration of the survey; the term can be used to refer to qualitative interviews but no qualitative data were collected in our study.

3.2.1 Questionnaire development

The largest initiative

Most of the resource allocated to a specific condition or service within a PCT remains consistent year on year. Each year, commissioners may make marginal changes within a condition or service by investing extra resources, reconfiguring services or disinvesting resources. We wanted to identify the largest change that started in a particular year so that we could measure the impact of this change on outcomes. We called this change a 'commissioning initiative'. We recognised that the effect of the largest initiative in one year might be overshadowed by a larger initiative in previous years. For example the effect of an investment of £200,000 in diabetes in 2008/9 might be overshadowed by an

investment of £900,000 in 2007/8. Therefore we also sought to identify the largest initiative within the past three years.

We developed four condition-specific questionnaires to identify the largest initiative commissioned within that condition/service which started during the previous financial year. Commissioners were then asked to describe that initiative or the larger initiative in the previous two years, its expected outcomes, and processes used to develop and manage the commissioning of that initiative.

Expected outcomes

The original research brief for this study identified the following outcomes that were expected to be related to commissioning activity:

- Service quality and responsiveness
- Health outcomes
- Health inequalities
- Financial balance

We identified specific outcomes within these types of outcomes during the development and piloting of our questionnaire with commissioners (Figure 3.1). We also offered the option of reporting other outcomes. Commissioners were asked to list the primary and secondary outcomes they expected from the initiative and the time it would take to achieve these expected outcomes.

Figure 3.1 Outcomes itemised in the questionnaire

Health reform goals	Potential outcomes of initiatives
Service quality and responsiveness	Reduction in emergency hospital admissions Reduction in hospital outpatient use Increase in hospital outpatient use Reduction in waiting times for outpatients Increase in access to care Increase in patient choice Movement of care into the community
Health outcomes	Improved disease-specific health outcomes Improved general health outcomes Reduction in mortality
Health inequalities	Reduction in health inequalities
Financial balance	More efficient use of resources Improved financial stability for the PCT

Processes

We used three sources to identify potential commissioning processes that might be associated with outcomes. First, world class commissioning was introduced in response to concerns about the low quality of commissioning; we used the competencies to identify a set of processes that were associated with high quality commissioning (Department of Health, 2007). Second, evaluations of commissioning models both within the NHS (Goodwin et al, 1998) and worldwide have identified processes of commissioning considered to be important (Ham, 2008). Third, during the pilot, commissioners identified processes that they felt helped or hindered an initiative to produce outcomes and these were added to the final questionnaire. The processes grouped into five domains (Figure 3.2).

Figure 3.2 Processes included in the questionnaire

Domain	Justification
clinical leadership and engagement	Clinical leadership has been promoted as a positive aspect of commissioning through successive policies of practice-based commissioning, GP commissioning consortia, and clinical commissioning groups. We asked if clinicians had instigated the initiative and if they had been involved in shaping and developing it.
public and patient involvement	Policy makers have attempted to promote public and patient involvement in commissioning and indeed this was a world class commissioning competency. We asked whether local patients, patient organisations and the general public had been involved in developing and shaping the initiative.
evidence and needs assessment	Good commissioning involves detailed assessments of need and cost, and evidence-based initiatives known to produce the required outcomes.
leadership and management	World class commissioning and evaluations of commissioning models have identified leadership and management as important to quality commissioning.
managing barriers	During our pilot interviews, commissioners discussed the practical difficulties they sometimes faced around resistance to shifting resources and disinvestment, and how different organisations having competing priorities that were not aligned with commissioners' priorities could hamper the success of any initiative.

Piloting
A draft questionnaire was piloted with commissioners in two PCTs. In one PCT we met with two commissioners who had completed the draft questionnaire to discuss the clarity of questions and any gaps. We then developed another draft which was used with four commissioners in another PCT where telephone interviews were undertaken and commissioners asked to provide feedback on the questionnaire.

Final questionnaire
The final questionnaire used in the 2009 survey is in Appendix 1. This focused on initiatives starting in 2008/9 or a larger initiative in the previous two years. The questionnaire was amended slightly for the 2010 survey because we only asked repeat respondents for details of the largest initiative starting in 2009/10. If the PCT was new to the sample in 2010 we asked about initiatives in the previous four years.

3.2.2 Ethics and Research Governance

Our study was classed as 'service evaluation' by South Humber Local Research Ethics Committee and therefore we were not required to apply for research governance in the 152 PCTs. We obtained ethical approval for the study from the University of Sheffield. We then wrote to the research governance lead in each PCT and informed them of our intention to carry out the research within their PCT. Four research governance leads informed us that they did not wish their PCT to participate in the study and we excluded them from the recruitment process.

3.2.3 Recruitment of PCTs

We wrote to the chief executive of each of the 152 PCTs to invite them to participate in the research. We requested the names and contact details of the managers leading commissioning for the four tracker conditions/services. Letters were sent out in batches of 20 between March and July 2009. We contacted non-responders at least four times by telephone.

Of the 148 PCTs approached at this stage, 77 PCTs agreed to participate, 59 PCTs did not want to participate and 12 PCTs did not respond. For the 2010 survey, we wrote to the chief executive of PCTs that had not participated in the 2009 survey to invite them to take part in the 2010 survey. A further 14 PCTs were recruited, giving a total of 91 PCTs.

3.2.4 Undertaking the structured telephone interviews

Our plan was to undertake structured telephone interviews with the commissioning manager for each condition/service in each participating PCT. PCTs that agreed to participate provided us with the details of the relevant commissioning managers. Some of the people named did not wish to participate in the research or did not respond to our request for an interview.

Between May and November 2009 we administered the questionnaire to 277 commissioning managers in the 77 PCTs who led commissioning for diabetes (n=74), CHD (n=65), COPD (n=71) and emergency and urgent care (n=67). We had some cancellations of interviews due to the 2009

H1N1 flu pandemic workload of PCT commissioners in this time period. This occurred particularly with CHD commissioners, who were often working in public health departments, and emergency and urgent care commissioners.

Between March and September 2010 we administered the questionnaire to 269 commissioning managers in the 91 PCTs who led commissioning for diabetes (n=72), CHD (n=67), COPD (n=64) and emergency and urgent care (n=66). Again, we had some cancellations of interviews due to work pressures. The proposed restructure of commissioning arrangements and abolition of PCTs was announced during the time we were attempting to arrange these interviews.

There were changes in personnel between the two years and we sometimes interviewed a different person in 2010 than in 2009 or were unable to follow up the 2009 interview in 2010 because there was either no one in post or the new commissioner did not wish to participate.

3.2.5 Analysis

The survey data was collected for use in the controlled before and after study rather than for a standalone purpose. The data are presented here to show in detail the data used in the analysis in Chapter 5. The surveys also offer an interesting snapshot of what commissioners report was commissioned, and how, within PCTs in that time period.

The data were analysed using PASW version18. Three analyses were undertaken:

1. We identified non-response bias by comparing characteristics of participating PCTs with those of non-participating PCTs.[a] We used the t-test and chi-squared for comparing the two groups.

2. We described the reported initiatives, expected outcomes and reported processes in each year. We asked about 27 processes on the questionnaire and this left us open to problems associated with undertaking multiple statistical tests when testing processes in Chapter 5. We reduced the numbers of process variables tested in Chapter 5 by selecting key processes and also grouping processes which appeared to address the same underlying concept. This latter approach was undertaken by creating three new variables: evidence and needs assessment; leadership and management; and barriers. Within each group we selected relevant items, scored them 5=strongly agree through to 1= strongly disagree, and took the mean to produce a single score. We tested the appropriateness of combining items using Cronbach's alpha which should lie between 0.7 and 0.9 if individual items are consistent with an underlying concept (Fitzpatrick et al, 1998).

3. We compared reported *processes* used to commission initiatives starting in 2008/9 and 2009/10 to test whether reported processes changed over time. For this we restricted our change over time comparisons to the group of PCTs for which we had data at both time points and that had an initiative to report in both years. We compared proportions of commissioners reporting the use of processes using McNemar's test for paired data (Fleiss, 1981).

For all tests we report a p value, and declare significance at the 5% level.

[a] PCT population, age breakdown, proportion single-handed practices, index of multiple deprivation 2007 source: Information centre: http://www.ic.nhs.uk/statistics-and-data-collections/

PCT surplus deficit score: Department of Health
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_079580

CHD, Diabetes and COPD unadjusted prevalence source: QMAS database - 2007/08 data as at end of June 2008. Available from NCHOD: http://www.nchod.nhs.uk/

WCC competency score and rank 2009: World Class Commissioning League Table, Health Service Journal 12th August 2010.
http://www.hsj.co.uk/topics/world-class-commissioning-scores-2010/world-class-commissioning-league-table/5018174.article

3.3 Results

3.3.1 PCT response rates

51% (77/152) of PCTs agreed to participate in the survey in 2009 and a further 14 PCTs agreed to participate in 2010 (60%, 91/152).

3.3.2 PCT non-response bias

We compared the characteristics of participating PCTs with non-participating PCTs for the 2010 survey (Table 3.1). Non-participating PCTs were ranked lower in the world class commissioning assurance exercise and were more likely to be in deficit.

3.3.3 Description of commissioning managers responding

For both surveys, respondents were commissioning managers with special responsibility for the service/condition, with the exception of a small number of participants who were the directors of commissioning. That is, we interviewed commissioners who were most likely to know about initiatives relevant to our study. We interviewed up to four commissioners in each participating PCT; sometimes a single commissioner covered all long term conditions and completed the three questionnaires related to diabetes, CHD and COPD. In the 2009 survey, participants had been within their position at their PCT for a median of 2 years. However, over a third of participants had been in post for a year or less (37%, 99/271), with 15% in post for 6 months or less. That is, a considerable minority of respondents had little corporate memory of commissioning for the condition/service of interest. Only 12% (32/271) of respondents had been in post longer than three years and therefore could answer with confidence the question about the initiatives commissioned within the past three years. Some respondents asked colleagues for details of initiatives prior to the interview (as we had requested) so were able to provide this information.

3.3.4 The initiatives

Numbers of initiatives

Around two thirds of managers in each survey reported that the PCT had commissioned initiatives that started within the previous financial year, or reported that a larger one had occurred in the previous two years: 63% (191/305) in the 2009 survey and 58% (140/241) in the 2010 survey.

Table 3.1 Comparison of participating and non-participating PCTs (2010 survey)

Variable	Participating PCTs	Non-participating PCTs	P value
PCT size (mean population)	356,000	303,000	0.092
Deprivation score (mean)	24.39	22.76	0.283
% single-handed practices (mean)	13	14	0.836
% patients age 75+ (mean)	7.6	7.5	0.660
CHD unadjusted prevalence (mean %)	3.6	3.4	0.112
Diabetes unadjusted prevalence (mean %)	3.9	3.9	0.782
COPD unadjusted prevalence (mean %)	1.6	1.4	0.070
Surplus/deficit as % of turnover 2006/7 (mean %)	-0.09	-1.09	**0.024**
Mean 2009 total competency score (out of 120).	49	48	0.424
Mean 2010 total competency score (out of 132).	74	72	0.305
Mean WCC rank 2009 (Lowest rank best)	68	84	**0.031**
Mean WCC rank 2010 (Lowest rank best)	67	80	0.058
N	91	61	

Table 3.2 Timing of numbers of largest known initiatives described

Year started	Diabetes	COPD	CHD	EUC
2006/7	9	12	8	7
2007/8	13	12	12	12
2008/9	39	39	37	42
2009/10	28	31	35	39

Figure 3.3 Typology of initiatives

Condition	Aim of initiative	Examples
Diabetes	Improving glucose control	Patient education, psychological support, additional insulin pump funding.
	Management of complications	Improvements to podiatry services, retinal screening, complex wound care.
	Moving from secondary to community and primary care	Local enhanced services to enable patient reviews and insulin initiation to be undertaken in primary care, funding diabetes specialist nurses and clinical diabetologists to work in the community.
COPD	Improved self management	Investment in pulmonary rehabilitation programmes, patient support groups, self-care telephone helpline, text service from Met Office providing alerts when unfavourable weather conditions due, telehealth monitoring service.
	Improved community support to prevent admissions	Investment in community respiratory teams to provide support at home, active follow-up following hospital discharge, early supported discharge teams, purpose built centre with community beds and integrated services.
	Improved support in primary care to reduce outpatient use	Specialist workers (nurses and GPs with special interest in COPD) in primary care, training to allow GPs to undertake patient reviews in primary care, spirometry training, screening for undiagnosed patients.
	Improved efficiency of prescribing	Oxygen assessment service review to reduce unnecessary oxygen prescribing, prescription reviews.
CHD	Improved management in primary care	Patient reviews and diagnostic testing in primary care, case finding and vascular screening programmes, wireless telemedicine in primary care.
	Improved community services to reduce outpatient use	Community services and specialist nursing services for patients with heart failure, atrial fibrillation and arrhythmia, community open access echo facilities.
	Other	Cardiac rehabilitation services, increasing capacity for cardiac interventions, opening cardiology centre.
EUC	Offer primary care alternative in emergency departments (EDs)	GP in ED to treat minor conditions or stream patients away from ED, telephone help for GPs wanting to admit patients to provide them with information about community alternatives.
	Improvements in ambulance service	Liaison officers to improve handover at ED, additional vehicles to support discharge, alternative pathways for non-urgent calls to prevent admissions.
	Improved community support to prevent admissions	Increase in intermediate care/nursing home beds to allow step-up step-down provision, rapid response teams to allow patients to be dealt with in own home, admission avoidance teams working in ED to prevent admissions.
	Enhancing existing services and improving access	Opening of GP-led health centres, nurse-led walk-in centres, urgent care centres, integrating of services to ensure patients can access appropriate services, extending hours of existing services.
	Recommissioning of services to improve efficiency	Changing existing providers and altering existing service specification to improve the services available for the cost.
	Other	Opening of clinical decision unit with observation beds in ED.

Timing of initiatives
Most of the initiatives reported occurred in the financial years 2008/9 and 2009/10 (Table 3.2).

Description of initiatives
Respondents described the initiatives and we constructed a typology of these initiatives (Figure 3.3).

Numbers of people affected by initiatives
Over 80% of the reported initiatives were PCT-wide and could have been of benefit to most individuals with the specific condition or at risk of needing emergency or urgent care. This was consistent across conditions. Whilst some were aimed at a small sub-group of people with the condition (for example insulin pump schemes only suitable for a minority of diabetes patients) we calculated spend per total patients with the condition because outcome data was not specific to patient sub-groups eligible for an intervention.

Size of investment in initiatives
Commissioners described a wide range of investments (mean £391k, median £204k 2008/9; mean £362k, median £133k 2009/10). In 2008/9 two PCTs reported cost-neutral service reconfigurations and no PCTs reported disinvestments. In 2009/10 there were 12 cost-neutral reconfigurations and two disinvestments reported.

When respondents described initiatives in the 2009 survey, the largest investments occurred in 2008/9. Respondents describing the largest investment in the previous two years tended to describe small investments compared with no investment made in 2008/9.

It was important to consider not simply the size of investment but investment per patient with the condition. The Association of Public Health Observatory estimate of the numbers of people with each condition was used as the denominator in these calculations (APHO website). These estimates are based on actual prevalence data from the Health Survey for England and adjusted for age, sex, ethnicity, smoking status, rurality and deprivation score of PCT. For diabetes and COPD the estimates from the Health Survey for England included identification of undiagnosed cases. For CHD, estimates were based on patient-reported doctor diagnosed CHD and therefore unlikely to include the same degree of undiagnosed disease. The PCT population was used as the denominator for emergency and urgent care initiatives. Investment per head of relevant population differed by condition/service (Table 3.3).

Budgets used for investments
Most initiatives starting in 2008/9 were described as funded recurrently and from the standard PCT budget (Table 3.3).

3.3.5 The expected outcomes

We asked respondents for one or two main outcomes, any secondary outcomes, when they would be likely to see the change (immediately, within one year, within two years, longer than two years) and the size of change expected for the main outcomes. The expected outcomes of initiatives were very similar for initiatives starting in 2008/9 and 2009/10. These are displayed for initiatives starting in 2008/9 (Table 3.4). The most common main outcomes expected were a reduction in emergency admissions (48% of initiatives) and improved disease-specific health outcomes (40% of initiatives). The most common main outcomes expected to occur immediately or within one year were

- reduction in emergency admissions (36%)
- improved disease-specific outcomes (23%)
- increase in access to care (20%)
- movement of care into the community (20%)
- and 'other' (18%).

The expected outcomes differed by condition/service (Table 3.5). The most frequently reported main outcomes by condition are highlighted by the shaded cells in Table 3.5 (shaded if main outcomes for >=15% of initiatives for that condition/service). As well as the common outcomes identified in Table 3.4, other important outcomes were reduction in outpatient use for diabetes and more efficient use of resources for diabetes and emergency and urgent care.

Table 3.3 Size of investment in largest initiatives in 2008/9

	Diabetes N=39	COPD N=39	CHD N=37	EUC N=42
Investment (£)				
Mean	276,597	179,901	455,642	642,550
Median	200,000	100,000	255,000	440,000
Range	10k -1,500k	6.5k-800k	0k-7,198k	0k-4,000k
Mean investment per patient with condition (£)	17.88	16.61	27.63	2.15
Type of investment				
%Recurrent	85% (33/39)	76% (28/37)	86% (31/36)	68% (27/40)
Source of budget				
Standard PCT	92% (36/39)	84% (32/38)	83% (30/36)	95% (39/41)

Table 3.4 Expected outcomes for initiatives starting in 2008/9 (N=157)

Type of outcome	Outcome	% stating this as **main or secondary** outcome	% stating as **main** outcome only	% stating as main outcome expected immediately or within one year
Service quality and responsiveness	Reduction in emergency hospital admissions	72%	48%	36%
	Reduction in hospital outpatient use	48%	15%	11%
	Increase in hospital outpatient use	4%	0%	0%
	Reduction in waiting times for outpatients	13%	1%	1%
	Increase in access to care	63%	22%	20%
	Increase in patient choice	43%	8%	7%
	Movement of care into the community	58%	23%	20%
Health outcomes	Improved disease-specific health outcomes	72%	40%	23%
	Improved general health outcomes	57%	15%	7%
	Reduction in mortality	41%	12%	1%
Health inequalities	Reduction in health inequalities	56%	15%	5%
Financial balance	More efficient use of resources	64%	15%	12%
	Improved financial stability for the PCT	31%	8%	5%
Other	Reducing emergency department waiting time (n=7) or attendances (n=9), promoting self care (n=9), and reducing length of stay (n=6).	25%	19%	18%

Table 3.5 Percentage of initiatives in each condition/service with different main outcomes expected within a year for initiatives starting in 2008/9

Type of outcome	Main outcome	Diabetes N=39	COPD N=39	CHD N=37	EUC N=42
Service quality and responsiveness	Reduction in emergency hospital admissions	15%	59%	19%	50%
	Reduction in hospital outpatient use	28%	10%	8%	0%
	Reduction in waiting times for outpatients	5%	0%	0%	0%
	Increase in access to care	23%	5%	19%	29%
	Increase in patient choice	8%	3%	3%	12%
	Movement of care into the community	18%	28%	3%	29%
Health outcomes	Improved disease-specific health outcomes	46%	31%	11%	2%
	Improved general health outcomes	8%	13%	8%	0%
	Reduction in mortality	0%	0%	5%	0%
Health inequalities	Reduction in health inequalities	10%	8%	3%	0%
Financial balance	More efficient use of resources	15%	5%	3%	21%
	Improved financial stability for the PCT	8%	3%	0%	10%
Other		13%	20%	0%	36%

3.3.6 The processes used to commission initiatives

On the questionnaire we asked about clinical leadership and engagement, public and patient involvement, use of research evidence and needs assessment, management and leadership, and potential barriers such as disinvestment and competing priorities. We expected that initiatives with clinical leadership, based on evidence, managed well and without barriers would be more likely to produce expected outcomes.

Clinical leadership and engagement

Respondents reported that the PCT was the most frequent instigator of initiatives starting in the financial years 2008/9 and 2009/10 (Table 3.6). Practice-based commissioners instigated about one in eight initiatives. There was a shift to 'group commissioning' over time (in the paired analysis 10/68 v 28/68, p=0.001). An example of a 'group' was a combination of the PCT, PBC and service providers. Practice-based commissioners were reported as instigating initiatives either alone or in groups for 18% (28/154) of initiatives starting in 2008/9 and 29% (40/138) starting in 2009/10. This increase was not statistically significant in the paired analysis (15/68 v 19/68, p=0.481).

Table 3.6 Did a specific person or group instigate this initiative?

	PCT	PBC	Provider	Group+	Other	N
2008/9 initiative	55%	13%	5%	24%	3%	154
2009/10 initiative	35%	12%	3%	40%	10%	138

+some combination of PCT, PBC, service providers or others such as cardiac networks together instigated initiative

Respondents reported that most initiatives had some involvement from a clinician when being developed and shaped (Table 3.7). Full involvement was less likely from general GPs not usually involved with the PCT than from specialist clinicians such as diabetologists and GPs usually involved with the PCT. We created a variable indicating ANY involvement by a GP including PBC, GPs usually involved with the PCT and other GPs. 82% (125/157) of initiatives had some GP largely or fully involved in its development or shaping in 2008/9 and 79% (103/131) in 2009/10. There was no change in reported clinical involvement between initiatives starting in 2008/9 and 2009/10.

Public and patient involvement (PPI)

There was less likely to be PPI than clinical involvement reported by respondents (Table 3.8). We looked at the extent to which there was any reported PPI in an initiative and found that 35% (52/149) of initiatives had PPI fully or largely involved for 2008/9 and 51% (67/132) for 2009/10. There was evidence of increasing PPI reported over the two years within the paired analysis (21/65 v 33/65, p=0.043).

Evidence and needs assessment

Most initiatives were reported as being based on assessments of need and evidence (Table 3.9).

Table 3.7 Extent of reported CLINICAL involvement in developing and shaping initiative

		Fully	Largely	To some extent	Not at all	N/A	N
Specialist clinicians	2008/9	38%	32%	24%	5%	2%	151
	2009/10	36%	33%	23%	7%	1%	133
GPs who are usually involved in the PCT	2008/9	39%	27%	30%	4%	<1%	153
	2009/10	34%	32%	29%	2%	2%	133
Other GPs	2008/9	18%	20%	50%	10%	1%	153
	2009/10	12%	25%	47%	14%	1%	131
PCT public health specialists*	2008/9	31%	21%	33%	15%	0%	149
	2009/10	23%	27%	37%	13%	0%	131
Practice-based commissioners	2008/9	33%	20%	38%	9%	0%	152
	2009/10	33%	20%	37%	9%	1%	133

*Public health specialists may or may not be clinical

Table 3.8 Extent of reported PPI in developing and shaping initiative

		Fully	Largely	To some extent	Not at all	N/A	N
Local patients	2008/9	13%	15%	56%	16%	0%	144
	2009/10	17%	24%	41%	18%	0%	131
Patient organisations	2008/9	10%	8%	49%	31%	1%	143
	2009/10	16%	14%	28%	36%	6%	128
General public	2008/9	5%	3%	36%	51%	5%	142
	2009/10	4%	9%	37%	45%	5%	130

Table 3.9 Reported use of needs assessment and evidence in developing and shaping initiative

		Strongly agree	Agree	NA / DK	Disagree	Strongly disagree	N
A detailed needs assessment was undertaken by the PCT	2008/9	27%	59%	2%	10%	0%	152
	2009/10	28%	47%	18%	6%	0%	131
A search for research evidence of effectiveness was undertaken by the PCT	2008/9	28%	54%	5%	13%	<1%	152
	2009/10	21%	63%	8%	8%	0%	131
Research evidence of effectiveness was found	2008/9	22%	52%	4%	17%	0%	149
	2009/10	22%	50%	18%	8%	1%	131
A detailed assessment was made of the cost of the initiative	2008/9	35%	58%	1%	7%	0%	153
	2009/10	47%	47%	3%	2%	0%	131

Leadership and management

Most initiatives were reported as having leadership and performance management in place (Table 3.10).

Managing barriers: disinvestment and competing priorities

A sizeable minority of initiatives were reported as facing barriers around disinvestment and competing priorities (Table 3.11).

Other processes measured

We asked about involvement of Strategic Health Authorities (SHAs) and Local Authorities (LAs): 9% and 14% of initiatives starting in 2008/9 had SHAs and LAs respectively reported as either fully or largely involved in their shaping and development. We also asked whether the initiative was developed from a similar one elsewhere: 67% of respondents strongly agreed or agreed that this was the case for initiatives starting in 2008/9. Finally,16% of respondents strongly agreed or agreed that the Framework for procuring External Support for Commissioners (FESC) had been used for initiatives starting in 2008/9.

Table 3.10 Reported leadership and management for initiative

		Strongly agree	Agree	N/A / Don't know	Disagree	Strongly disagree	N
A set of performance management indicators is in use	2008/9	35%	59%	<1%	5%	0%	153
	2009/10	46%	47%	4%	4%	0%	133
A PCT person has been designated as responsible for measuring performance	2008/9	37%	59%	1%	3%	0%	154
	2009/10	48%	45%	4%	3%	0%	127
The initiative remains a priority within the PCT senior management	2008/9	45%	42%	4%	8%	1%	154
	2009/10	45%	42%	10%	3%	0%	129
There has been continuity of management for this initiative through its development & implementation	2008/9	35%	36%	3%	23%	3%	154
	2009/10	43%	42%	7%	7%	1%	131
There has been enough leadership of this initiative through its development & implementation	2008/9	29%	51%	3%	17%	<1%	153
	2009/10	40%	44%	9%	6%	1%	130

Table 3.11 Reported barriers around disinvestment and competing priorities for initiative

		Strongly agree	Agree	NA / Don't know	Disagree	Strongly disagree	N
The need for the PCT to shift resources between providers has presented a barrier	2008/9	3%	27%	18%	40%	10%	154
	2009/10	11%	17%	15%	44%	13%	127
The need for the PCT to disinvest from some areas has presented a barrier	2008/9	4%	21%	29%	38%	8%	154
	2009/10	9%	11%	17%	51%	12%	125
All organisations involved have had the same priorities	2008/9	12%	50%	4%	30%	4%	154
	2009/10	12%	41%	15%	28%	5%	129
The need for multiple organisations to work together has presented a barrier	2008/9	3%	24%	5%	57%	11%	154
	2009/10	9%	22%	13%	49%	7%	129

3.3.7 Grouping processes for analysis

We reduced the number of processes for testing in later chapters to nine (Figure 3.4). The last group of processes 'barriers' is different from the others. It is not an action taken by PCTs but rather a difficulty they faced.

Figure 3.4 Groups of processes for testing in Chapter 5

Grouped process	Categories and scales
Who instigated the initiative	PCT=1, PBC=2, Other=3
PBC instigated the initiative alone or as part of a group	Yes=1, no=0
Specialist clinicians were involved in developing and shaping the initiative	Largely or fully=1, some extent or not =0
Any GP was involved in developing and shaping the initiative	Largely or fully=1, some extent or not =0
Public health specialists were involved in developing and shaping the initiative	Largely or fully=1, some extent or not =0
Any PPI developed and shaped the initiative	Largely or fully=1, some extent or not =0
Assessment was made of need, cost and evidence	Mean of sum of items in Table 3.7. Score ranging from 1-5, where high score is best i.e. lots of assessments made.
There was leadership and management	Mean of sum of items in Table 3.8. Score ranging from 1-5, where high score is best i.e. strong leadership.
There was a lack of barriers around disinvestment and competing priorities	Mean of sum of items in Table 3.9. Score ranging from 1-5, where high score is best i.e. fewer barriers.

3.4 Implications for main analysis

- We identified a set of initiatives described by commissioners to test in Chapter 5. Most initiatives were investments rather than reconfigurations or disinvestments. Therefore we tested whether the 'size of investment per patient with the condition' produced expected outcomes.
- The most common main outcomes expected to occur immediately or within one year were a reduction in emergency admissions (36% of initiatives), improved disease-specific outcomes (23%), increase in access to care (20%), movement of care into the community (20%), and 'other' (18%). For specific conditions/services, there were additional outcomes of reduction in outpatient use for diabetes and financial efficiency for diabetes and emergency and urgent care.
- There were too few initiatives with a main outcome of reduction of health inequalities and improving the financial balance of the PCT to pursue these types of outcomes further.
- We identified a reduced set of reported processes to test for impact on initiatives found to produce expected outcomes (see Figure 3.4).

4. MEASURING OUTCOMES: SOURCES OF ROUTINE DATA

4.1. Objective

To identify and describe routine data on outcomes expected from the initiatives identified in Chapter 3.

4.2 Methods

We took the commonly expected outcomes of initiatives (see end of Chapter 3) and looked for relevant routinely available data to measure change over time. We needed to identify data at a PCT level rather than say at a general practice level, measured before and after the initiatives, that is, between 2007/8 and 2010/11.[1] The outcomes and sources of related routine data that we identified are summarised below (Figure 4.1).

Figure 4.1 Source of routine data on outcomes

Health reform goals	Potential outcomes of initiatives	Condition/service	Source of routine data
Service quality and responsiveness	Reduction of emergency hospital admissions	Diabetes COPD CHD EUC	HES IP
	Reduction of outpatient attendances	Diabetes	HES OP
	Improved access to care	Diabetes CHD EUC	Nothing available
	Movement of care into the community	Diabetes COPD EUC	Nothing available
Health outcomes	Disease-specific health outcomes	Diabetes COPD	QOF[2]
Financial efficiency	More efficient use of resources	Diabetes EUC	Nothing available
Other	Reduced waiting time and attendances in emergency departments	EUC	HES A&E

1 In our original proposal we intended to collect data from 2004/5 and did this. However, whilst analysing the data we were concerned about undertaking a time series analysis as planned because of the lack of information about PCT investment prior to 2008/9. We changed our analysis to one comparing changes in outcomes in investing PCTs compared with changes in non-investing PCTs, based on a comparison of the year before the investment and the year after the investment .

2 Note that we were interested in QOF as a source of measurement of outcomes which PCTs were hoping to achieve through extra investment. We were not interested in QOF as a source of indicators of the quality of primary care or the relationship between QOF and outcomes, which has been explored by other researchers.

Using routine data is attractive to researchers because they are readily available, can be used retrospectively and offer a rich source of information about large numbers (Powell et al 2003). However, there are problems with using routine data which have essentially been collected for another purpose. Powell et al (2003) identify four key problems with it: measurement properties, controlling for case mix, coping with chance variation and data quality, some of which are relevant to studies ranking performance and thus are not relevant to our study. Problems relevant to our study include undermining of validity of measures by changes in reporting practices over time, chance variability showing differences that are not real or mask real differences, and regression to the mean. We pay attention to these issues during our analysis and interpretation of findings.

4.2.1 Rate of emergency hospital admissions: diabetes, COPD, CHD and EUC

We used Hospital Episode Statistics (HES) inpatient data to calculate rates of emergency hospital admissions. These were calculated using numbers of finished and unfinished continuous inpatient spells for patients of all ages in each financial year 2007/8-2010/11. Details of fields extracted are provided in Appendix 2. For the emergency and urgent care analysis we used all emergency admissions. For the disease-specific conditions we extracted data based on the specific ICD10 primary diagnosis codes (Figure 4.2).

Figure 4.2 ICD codes for calculating condition–specific admission rates

Condition	ICD 10 3 digit primary diagnosis code.
Diabetes	E10: Insulin-dependent diabetes mellitus E11: Non-insulin-dependent diabetes mellitus E12: Malnutrition-related diabetes mellitus E13: Other specified diabetes mellitus E14: Unspecified diabetes mellitus
COPD	J40: Bronchitis not specified as acute or chronic J41: Simple and mucopurulent chronic bronchitis J42: Unspecified chronic bronchitis J43: Emphysema J44: Other chronic obstructive pulmonary disease
CHD	I20: Angina pectoris I21: Acute myocardial infarction I22: Subsequent myocardial infarction I23: Certain current complication following acute MI I24: Other acute ischaemic heart diseases I25: Chronic ischaemic heart disease I50: Heart failure

We extracted annual counts by age, sex and PCT of residence for each subgroup. Directly age and sex standardised emergency admission rates were calculated using the standardisation methods detailed within the methods section of the Clinical and Health Outcomes Knowledge Base report (Lokhani et al, 2011a). The European population used by the National Centre for Health Outcomes Development was applied (Lokhani et al, 2011b).

We extracted HES data by PCT using 2006/7 resident population codes (152 PCTs). The Office of National Statistics mid-year populations had been adjusted for further boundary changes in 2010/11 (151 PCTs). The 2010/11 boundary changes were as follows: PCT code 5CC (Blackburn with Darwin PCT) became TAP (Blackburn with Darwin Teaching Care Trust Plus). We assumed this to be a direct conversion and TAP was used as the comparator for 5CC for previous years. Two PCTs (5P3 - East and North Hertfordshire and 5P4 - West Hertfordshire) merged to create 5QV (Hertfordshire). We calculated estimated populations for 5P3 and 5P4 for 2009/10 by applying the proportions within each age/sex band for the two PCTs in 2008/9 to the combined population in 2009/10 (www.nchod.nhs.uk.)

Data validation was undertaken by comparing our rates of emergency hospital admissions for diabetic ketoacidosis and coma with those from the NHS Information Centre compendium (www.nchod.nhs.uk.). Very small differences were apparent which were likely to be due to our exclusion of duplicate episodes.

4.2.2 Outpatient attendances: diabetes

We obtained HES outpatient data to calculate outpatient attendance rates for diabetes by PCT. Diagnosis coding for outpatient attendances is poor so we used treatment specialty as a proxy for disease group. The treatment specialty field was used because this is the specialty where the consultant worked rather than the specialty where they held their contract. Attendances were extracted for the following specialties: 300 = General medicine, 302 = Endocrinology, 307 = Diabetic medicine, 653 = Podiatry and 654 = Dietetics because people with diabetes may be referred to any of these clinics. A member of our team is a clinical researcher in diabetes and recommended that we focus on endocrinology and diabetes medicine clinics because a large proportion of attendees at these clinics would have diabetes. We extracted data for these two clinics and checked raw data on numbers of attendances by PCT for each of the four years. Regardless of whether we measured outpatient attendances at diabetes medicine clinics only, endocrinology clinics only, or the two combined, we found extremely large changes between years within individual PCTs. We display this data for the first 10 PCTs in our dataset (Table 4.1) to illustrate the concerns this raised about the quality of the data. For example, for PCT 1, attendances appeared to quadruple between 2007/8 and 2008/9 and for PCT 9 attendances appeared to increase by a factor of ten between 2009/10 and 2010/11. We did not have enough confidence in the accuracy of this data set for our intended analysis so did not calculate rates for analysis in Chapter 5. Imison & Naylor (2010) use total outpatient attendance rates per PCT between 2005/6 and 2008/9 to compare PCTs with referral management schemes and those without. They showed large fluctuations in their data over time and had to exclude 58 of the 152 PCTs because of concerns about data quality. The fluctuations we saw at a speciality level were much larger than those at the total attendance level, and were too large for the data to be useable.

Table 4.1 Numbers of attendances at diabetes medicine and endocrinology clinics combined for first ten PCTs

PCT	2007/8	2008/9	2009/10	2010/11
1	919	4603	5732	5241
2	1189	1420	1804	2951
3	6276	6824	7406	8185
4	13310	12701	8458	7481
5	5231	7612	9587	10112
6	12450	14465	15509	15409
7	10062	10577	11133	11449
8	13607	16478	17355	17278
9	1264	1608	1662	15088
10	17159	22088	16928	13384

4.2.3 Disease specific health outcomes: diabetes, COPD

Disease specific health improvements were frequently expected for diabetes and COPD initiatives (see Table 3.5). The only routinely available measures of health outcome, or processes related to health outcome, at PCT level over the relevant time period were in the Quality and Outcomes Framework (QOF). We obtained this data from the NHS Information website for the period 2007/8 to 2010/11 (http://www.ic.nhs.uk/statistics-and-data-collections/audits-and-performance/the-quality-and-outcomes-framework). A large number of indicators were measured each year (see Appendix 3). We identified five potential indicators related to the initiatives in our study (Figure 4.3).

We then considered the relevance of these five indicators to each of the initiatives in our study. When survey respondents described the expected outcome for their single largest initiative as 'improved disease-specific health outcomes', we assigned this initiative to a specific QOF indicator. For example, for diabetes we considered whether an initiative was likely to affect the QOF outcomes of the proportion diabetes patients with good or moderate blood glucose control or the proportion of diabetes patients undergoing retinal screening. This was a subjective process undertaken by FS and AOC prior to analysis. We assumed that any diabetes initiative that was designed to help patients manage their condition better would lead to an improvement in HbA1c. Similarly we considered whether the COPD initiatives had the potential to affect QOF indicators related to spirometry and measurement of FEV_1.

.

- For diabetes, we identified 31 PCTs which had invested in initiatives in 2008/9 with the aim of improving blood glucose control. There were two QOF indicators related to blood glucose control. The thresholds for achievement for these two indicators changed over time (Figure 4.3).
- For diabetes, we identified only 5 PCTs which had invested in initiatives in 2008/9 to increase retinopathy screening. This was a small number of PCTs but we felt that it would be useful to test the effect of these initiatives, and that it would be possible to do so because the QOF indicator was measured consistently over time.
- For COPD, we identified only 3 PCTs with initiatives aimed at improving diagnosis confirmed by spirometry. In addition, the related QOF indicator was measured differently over time. Therefore we made the decision not to pursue this outcome measure further.
- For COPD, we found it difficult to relate initiatives to the QOF indicator of the % patients with a record of FEV_1. Therefore we made the decision not to pursue this outcome measure further.

Figure 4.3 Outcomes from Quality and Outcomes Framework data

Condition	Outcome	2007/8	2008/9	2009/10	2010/11
Diabetes	The percentage of patients with diabetes in whom the last HbA1c is X or less (or equivalent test/reference range depending on local laboratory) in the previous 15 months	DM20 X<7.5	DM20 X<7.5	DM23 X<7.0	DM23 X<7.0
	The percentage of patients with diabetes in whom the last HbA1c is Y or less (or equivalent test/reference range depending on local laboratory) in the previous 15 months	DM7 Y<10	DM7 Y<10	DM25 Y<9	DM25 Y<9
	The percentage of patients with diabetes who have a record of retinal screening in the previous 15 months	DM21	DM21	DM21	DM21
COPD	The percentage of all patients with COPD diagnosed in whom the diagnosis has been confirmed by post bronchodilator spirometry	COPD9	COPD12	COPD12	COPD15
	The percentage of patients with COPD with a record of FEV_1 in the previous 15 months	COPD10	COPD10	COPD10	COPD10

The QOF scheme has upper payment thresholds for each indicator and allocates points and payments to general practices which meet these thresholds. QOF data presents the points achieved, the numerator (i.e. number of people who have met a specific target), the denominator (number of people on the list who are eligible) and the disease register size. The number of points achieved does not capture the variation in measures between practices and PCTs due to the threshold effect, and therefore we used the percentage of patients with a condition for whom a PCT achieved the QOF indicator. We calculated this percentage using the QOF numerator divided by the total number of people who were on the QOF register for that disease.

4.2.4 Other outcomes

A key source of relevant routine data was HES A&E which offered waiting time and number of attendances at emergency departments from 2007/8 to 2010/11. However, these data were available as 'experimental statistics' in the earlier years because they were known to be incomplete. There were "11.9 million attendances reported in 2007/8 HES A&E excluding planned follow-up returns, compared to 19.1 million reported in Quarterly Monitoring of Accident and Emergency aggregate data for the equivalent period" and there were "15.8 million attendances reported in HES A&E (excluding planned follow-up appointments), compared to 21.4 million reported in Quarterly Monitoring of Accident and Emergency (QMAE) aggregate data for the equivalent period" for 2010/11 (quoted from www.hesonline.nhs.uk). The coverage increased from 62% to 74% over the time frame of our study but we made the decision not to pursue this outcome data in Chapter 5 due to concerns about the coverage and quality.

4.2.5 Summary of outcomes with data available for testing in Chapter 5

We report seven condition/service specific outcomes in Chapter 5. They were selected because they were the expected outcomes of a reasonable proportion of initiatives within the time scale of the study and there was reasonable quality routine data available over the relevant time period (Figure 4.4).

Figure 4.4 Seven outcomes to be explored in Chapter 5

Data source	Diabetes	COPD	CHD	EUC
HES	Emergency admissions	Emergency admissions	Emergency admissions	Emergency admissions
QOF	HbA1c <7 HbA1c<9 Retinopathy			

4.2.6 Analysis

The full analysis is reported in Chapter 5. Here we display a graph for each outcome for each condition showing the mean outcome for our respondents and non-respondents. This shows any changes in the outcome over time, changes in how the measurement was made over time, and any differences between respondents and non-respondents.

4.3 Display of outcome data

4.3.1 Rate of emergency admissions

Directly standardised rates of emergency admissions per 100,000 population for each disease/service are shown in Figures 4.5 to 4.8. Rates for diabetes, COPD and all conditions increased over time. Rates for CHD decreased over time; this decrease looks unusual in the context of rising emergency admission rates nationally but is supported by Public Health Observatory analysis showing a 16.5% reduction in directly standardised rates in England between 2003/4 and 2010/11 (South East Public Health Observatory website, accessed August 2012). Rates for respondents were always higher than for non-respondents, but both groups followed the same pattern over time. Note that different scales are used for the y-axis of each graph due the different admission rates of each condition.

Figure 4.5 DIABETES emergency admission rates per 100 000 population (directly standardised)

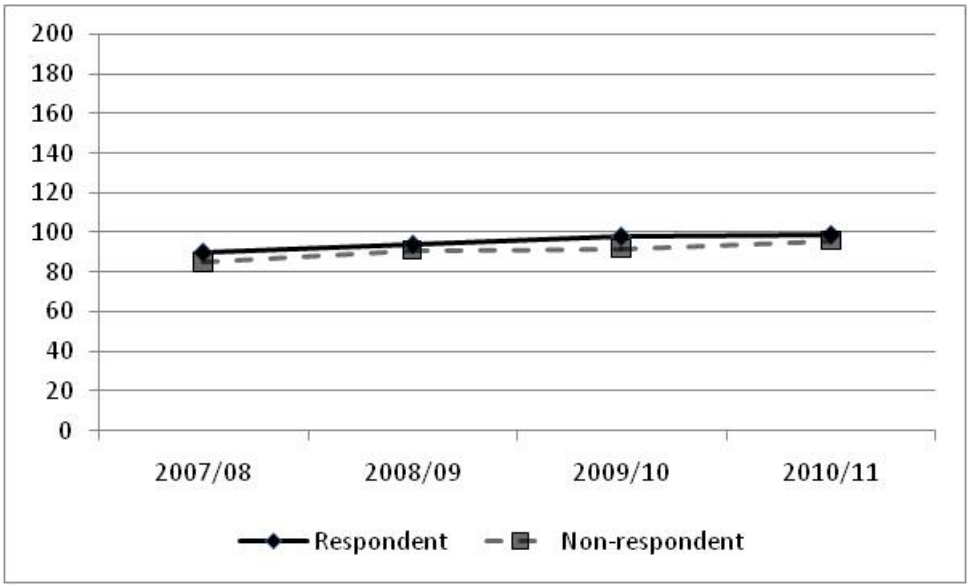


Figure 4.6 COPD emergency admission rates per 100 000 population (directly standardised)

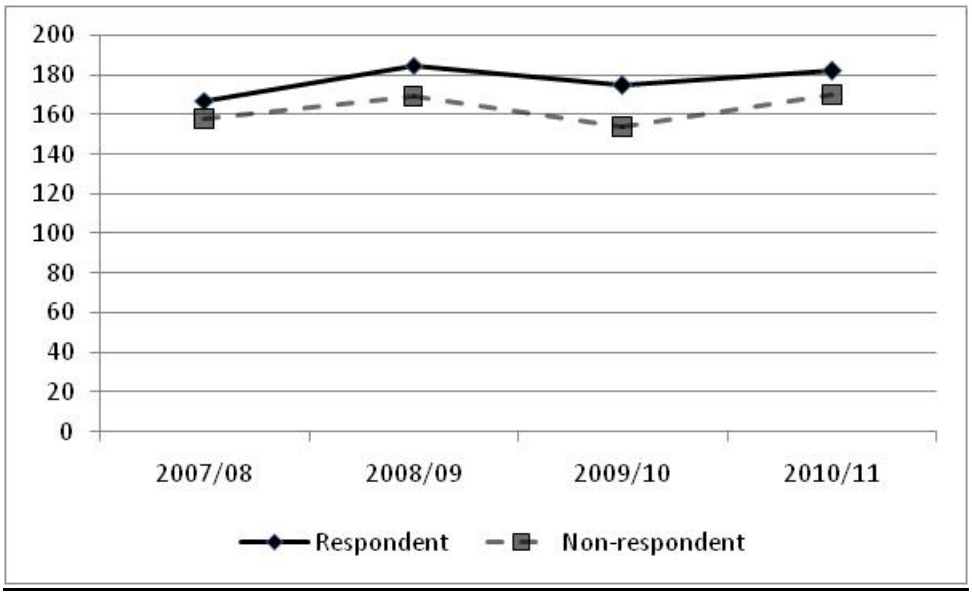


Figure 4.7 CHD emergency admission rates per 100 000 population (directly standardised)

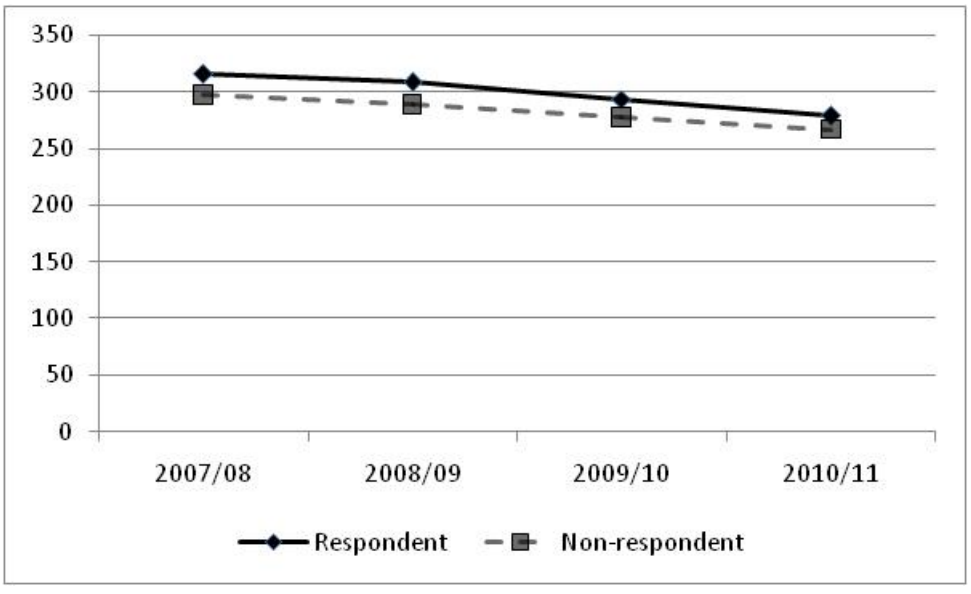
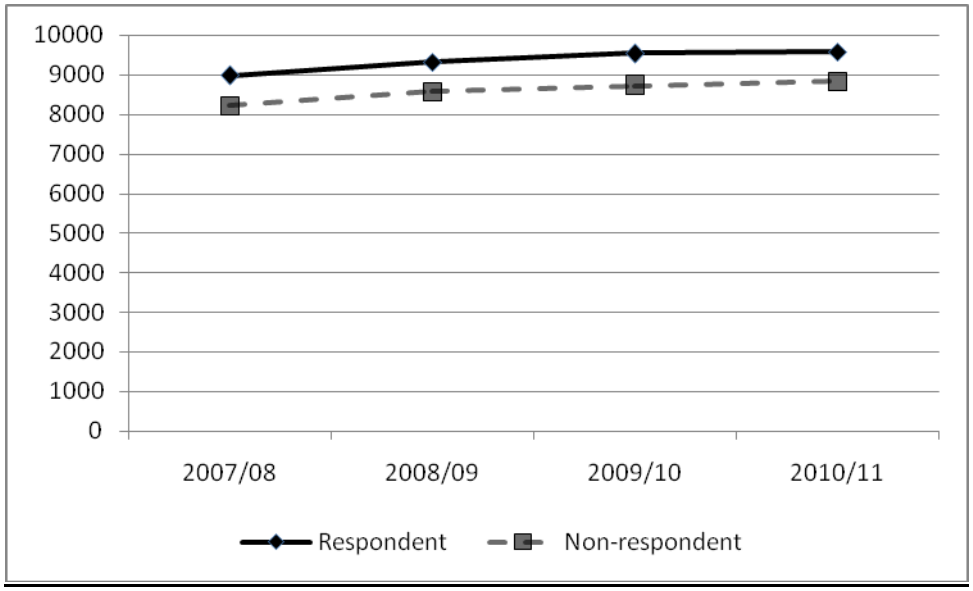


Figure 4.8 ALL emergency admission rates per 100 000 population (directly standardised)



4.3.2 Disease-specific health outcomes

The following three graphs show changes in disease-specific outcomes over time (Figures 4.9 to 4.11). The QOF indicator thresholds for GOOD and MODERATE control of HbA1c in diabetes changed during the time period of our study, with tougher targets set from 2009/10 onwards (Figures 4.9 and 4.10). We felt that the difference between the indicators used over the years was problematic but nonetheless worth pursuing within the analysis in Chapter 5. Respondents and non-respondents were almost identical in outcomes over time.

Figure 4.9 GOOD control of diabetes: % diabetes patients with HbA1c <7.5 (2007-9) or 7.0 (2009-11)

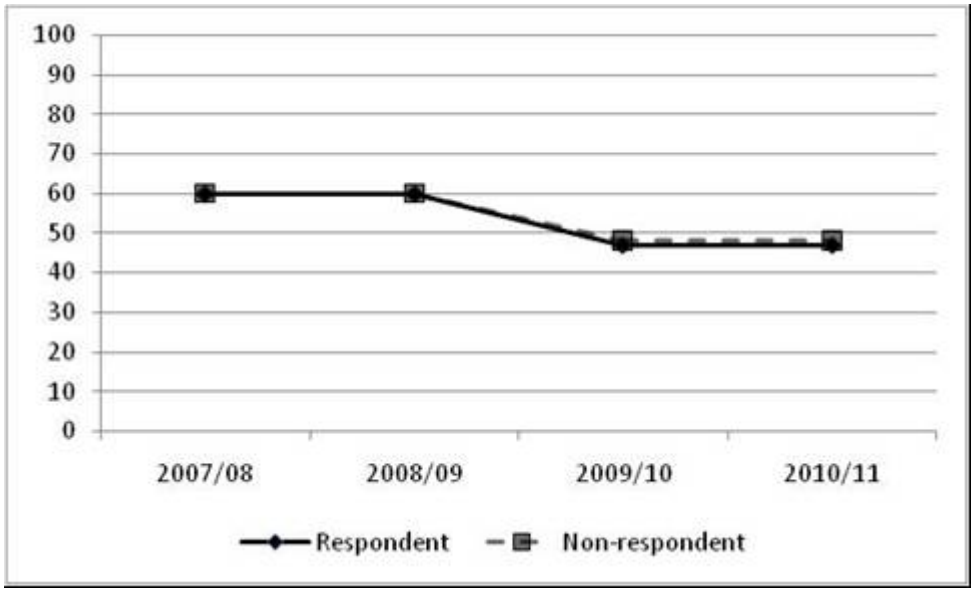


Figure 4.10 MODERATE control of diabetes: % diabetes patients with HbA1c <10.0 (2007-9) or 9.0 (2009-11)

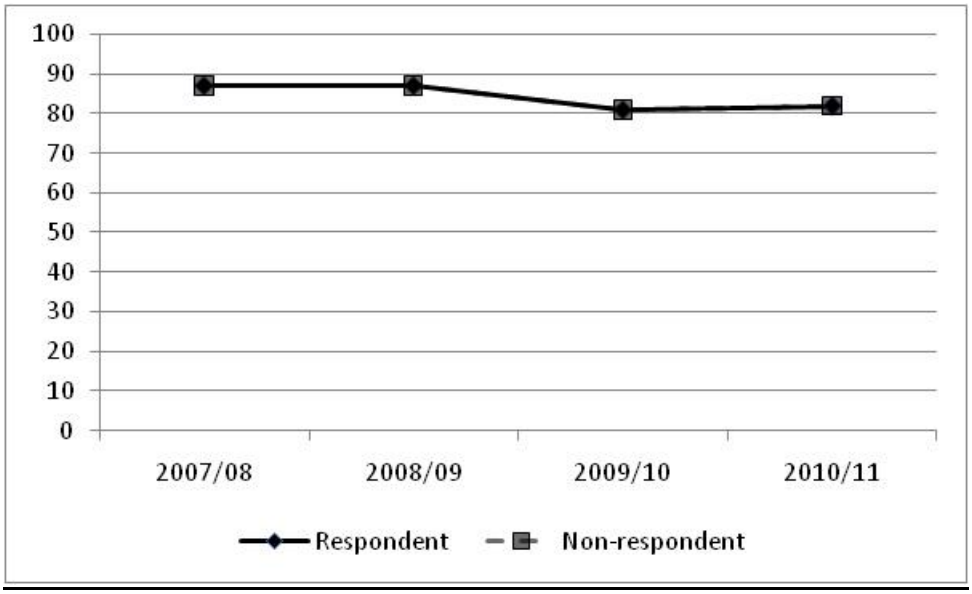
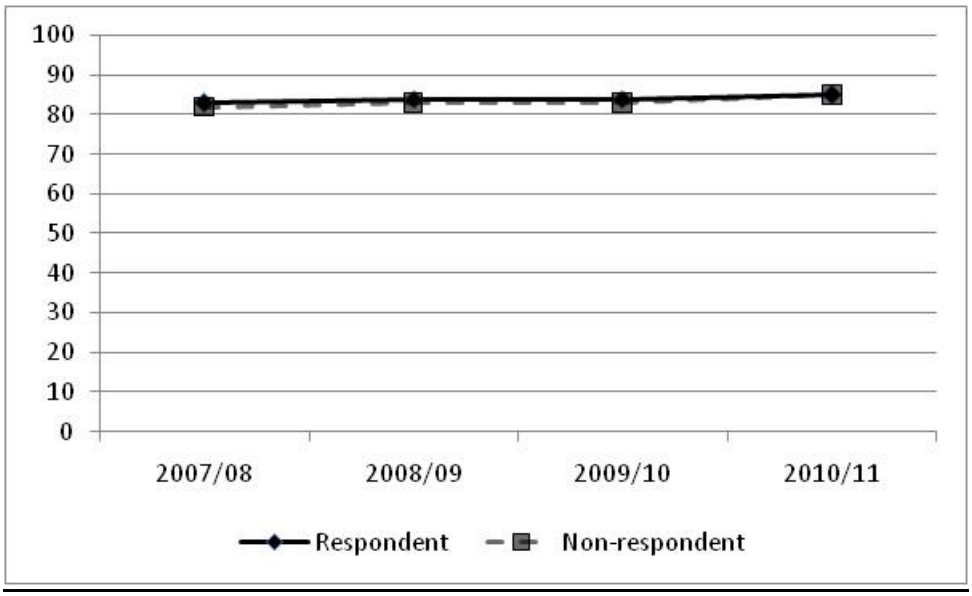


Figure 4.11 % diabetes patients with record of RETINAL screening in the previous 15 months



4.4 Implications for analysis in Chapter 5

Only seven outcome measures were useful for our main analysis in Chapter 5. Given the change over time in the HbA1c QOF indicator definitions, conclusions based on the analysis of these outcome measures should be viewed with caution. Whilst the QOF outcomes were similar for respondents and non-respondents to our PCT surveys, the directly standardised admission rates differed systematically, with respondents having higher rates than non-respondents.

5. CHANGES IN OUTCOMES ASSOCIATED WITH COMMISSIONING INITIATIVES

5.1 Objectives

1. To identify whether commissioning initiatives affect outcomes that can be measured using routinely available data.

2. To identify which commissioning processes reported by PCT commissioners are associated with the changes in routine outcomes that were consistent with achieving their aims.

5.2 Methods

5.2.1 Overview

We considered the effect of investment in initiatives described in Chapter 3 on the outcomes described in Figure 4.4. When we found changes in outcomes associated with investment in initiatives we then tested the effect of the commissioning processes described in Figure 3.3.

5.2.2 Design

Outcomes are affected by many issues and it is challenging to distinguish the effect of a single investment. Similarly we used our design. We designed our study to address attribution of change to any investment. We identified PCTs which made extra investment of a specific size in a specific condition at a specific time to achieve a specific outcome in a specific timeframe compared with PCTs which did not. That is, the design addressed specificity, temporality and dose-response (Bradford-Hill, 1965).

5.2.3 Analysis

We had partial information on the size and timing of investments for the years prior to 2008/9. For this reason we chose to go back no further than 2007/8 in our analyses. This precluded the use of an interrupted time series analysis across the whole period from 2004/5 to 2010/11, which had been our original aim. We chose instead to limit our analysis to before-after comparisons with 2007/8 as our earliest baseline year.

We undertook three analyses:

1. PRIMARY ANALYSIS: Test of effect of initiatives starting in 2008/9.

   We anticipated that, where a PCT had started a new initiative in 2008/9 with specified main outcomes expected within a given time period, we would be able to see a change in those outcomes compared with PCTs reporting that they had made no changes in that year. We expected the size of change in outcome to be related to the size of any initiative in terms of investment made per year per patient with the condition. We excluded the small number of

PCTs with reconfigurations and disinvestments. Separate analyses were undertaken for individual outcomes for individual conditions. Specifically we:

Tested for a one year effect by measuring the change in outcomes between 2007/8 and 2009/10 for PCTs with an initiative starting in 2008/9 with a main outcome expected within a year, compared to PCTs without any initiative. We excluded PCTs which had their largest initiative in the previous two years to ensure that outcomes from initiatives in previous years did not contaminate the analysis. We undertook a linear regression with the outcome in 2009/10 as the dependent variable, adjusting for the outcome in 2007/8, and testing the size of investment per patient with the condition. We adjusted for confounding variables (see later). We undertook weighted least squares regression, weighted by the denominator of rates used in the dependent variable, to account for rates based on small populations.

Tested for a two year effect by selecting initiatives with a main outcome expected within two years and repeated the above analysis with a dependent variable of outcome in 2010/11.

2. CONFIRMATORY ANALYSIS: Test of effect of initiatives starting in 2009/10

We undertook a one year analysis for initiatives starting in 2009/10 with a main outcome expected within a year, comparing outcomes in 2008/9 and 2010/11. Our aim was to confirm whether patterns seen for initiatives in 2008/9 were repeated for 2009/10.

3. CUMULATIVE ANALYSIS: Test of effect of initiatives starting in 2008/9 and 2009/10

We combined reported investments made in 2008/9 and 2009/10 and compared outcomes in 2007/8 and 2010/11 for any initiatives with main outcomes expected within two years for 2008/9 initiatives and within one year for 2009/10 initiatives.

The statistical analysis was based on reported size of investment as a continuous variable. We also display change over time by dichotomising the investment into ‘large’ (>£10 per patient with condition) and ‘small’ (<=£10), and graphing the mean outcome for large, small and no investments over the period 2007/8 to 2010/11.

5.2.4 Adjusting for confounders

We adjusted analyses for deprivation (Index of Multiple Deprivation 2007), age structure (% PCT population aged over 75) and the proportion of single-handed practices within a PCT because these have been found to be associated with our outcomes (see Chapter 1).

5.2.5 Testing processes

We found one statistically significant change in outcome for GOOD blood glucose control for diabetes. We selected PCTs making an investment in 2008/9 or 2009/10 with this expected outcome within two or one year respectively, and undertook a linear regression with the outcome in 2010/11 as the

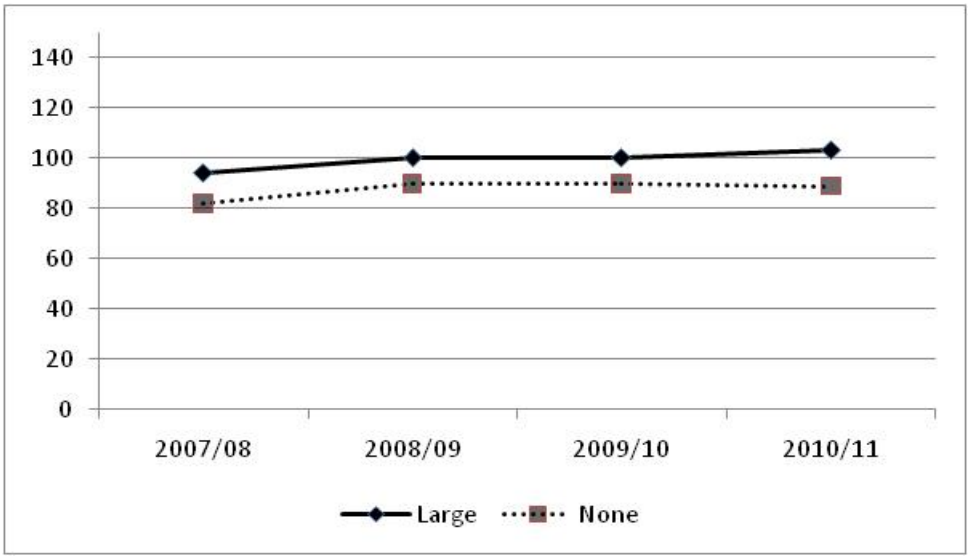
dependent variable, adjusting for the outcome in 2007/8 and the size of investment per patient with the condition, and testing the nine processes described in Figure 3.3. We undertook weighted least squares regression, weighted by the denominator of rates used in the dependent variable, to account for rates based on small populations. Two PCTs had invested in an initiative in both 2008/9 and 2009/10; process variables related to the 2008/9 initiative were selected for these two PCTs.

5.3 Results

5.3.1 Diabetes emergency admissions rate

Investment to reduce emergency admissions for diabetes was not common in our sample. Only 9 PCTs made investments during 2008/9 or 2009/10 with the main outcome of reducing emergency admissions for diabetes within two years (2008/9 investments) and one year (2009/10 investments). All investments were large (>£10 per patient with diabetes). In this sample, PCTs making large investments had slightly higher directly standardised rates at baseline than those making no investment (Figure 5.1), and rates increased slightly over time.

Figure 5.1 Directly standardised diabetes emergency admission rates for PCTs with large or no investments between 2008/9 and 2009/10



When we tested the effect of 'size of initiative investment' as a continuous variable, changes within a year were in the right direction but there was no evidence of an effect (Table 5.1).

Table 5.1 Effect on diabetes emergency admissions of investment of £10 per diabetes patient

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within a year for 2008/9 initiatives	5,17	-1.43 (-3.14,0.28)	0.120	-1.47 (-3.31,0.37)	0.138
Within two years for 2008/9 initiatives	5,17	+0.52 (-3.44, 2.4)	0.726	+0.73 (-1.93, 2.06)	0.592
Within a year for 2009/10 initiatives	4,55	-2.52 (-5.56, 0.56)	0.113	-1.81 (-4.35,0.75)	0.180
Within two years for 2008/9 and a year for 2009/10 initiatives	9,12	-0.25 (-1.82, 1.32)	0.761	+0.07 (-1.69,1.83)	0.933

5.3.2 COPD emergency admissions

Investments to reduce emergency admissions were much more common for COPD. 33 PCTs made investments in 2008/9 or 2009/10 with the expectation of reducing emergency admissions for COPD within one or two years. In our sample, PCTs making larger investments started off in 2007/8 with higher emergency admission rates (Figure 5.2), and rates generally increased over time for all groups.

Figure 5.2 Directly standardised COPD emergency admission rates for PCTs with large, small or no investments between 2008/9 and 2009/10

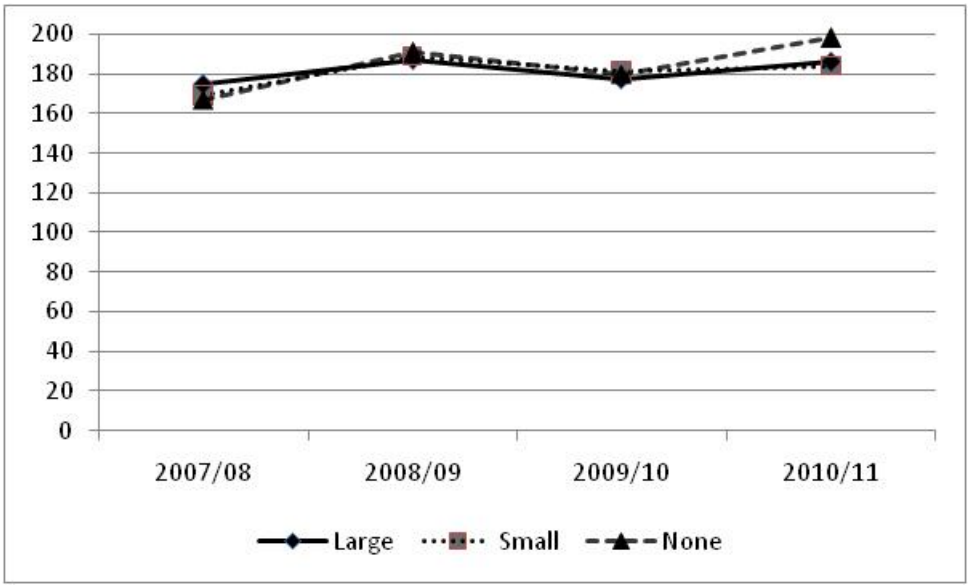


Figure 5.2 indicates that PCTs in our sample which reported making no investment to reduce COPD emergency admissions had a steeper increase in admission rates than those making an investment. When this was tested, the effect was in the right direction, with larger reductions occurring after two years than one year, but these changes were not statistically significant (Table 5.2).

Table 5.2 Effect on mean directly standardised emergency admission rates for COPD of investment of £10 per COPD patient

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within a year for 2008/9 initiatives	22,17	-0.76 (-5.22, 3.70)	0.737	-0.63 (-4.98,3.72)	0.775
Within two years for 2008/9 initiatives	28,17	-1.59 (-6.99,3.81)	0.556	-2.27 (-7.48, 2.94)	0.384
Within a year for 2009/10 initiatives	17,5	-0.30 (-3.35, 2.75)	0.845	-0.33 (-3.35,2.69)	0.827
Within two years for 2008/9 and a year for 2009/10 initiatives	33,10	-1.84 (-4.84,4.80)	0.225	-1.69 (-4.56, 1.19)	0.244

5.3.3 CHD emergency admissions

Seventeen PCTs made investments during 2008/9 or 2009/10 with the main outcome of reducing emergency admissions for CHD with a year or two. Most investments were large (>£10 per patient with CHD). In our sample, PCTs making large investments had higher directly standardised rates at baseline than those making small or no investment (Figure 5.3). Rates decreased steeply over time regardless of size of investment. When we tested the effect of 'size of initiative investment' as a continuous variable, the effect was in the right direction for change within a year but this was not statistically significant (Table 5.3).

Figure 5.3 Directly standardised CHD emergency admission rates for PCTs with large, small or no investments between 2008/9 and 2009/10

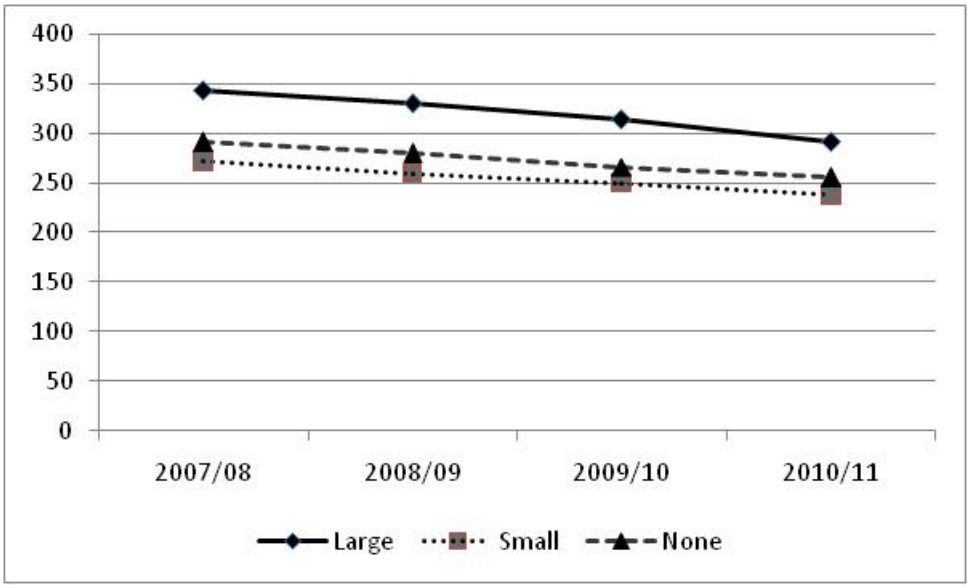


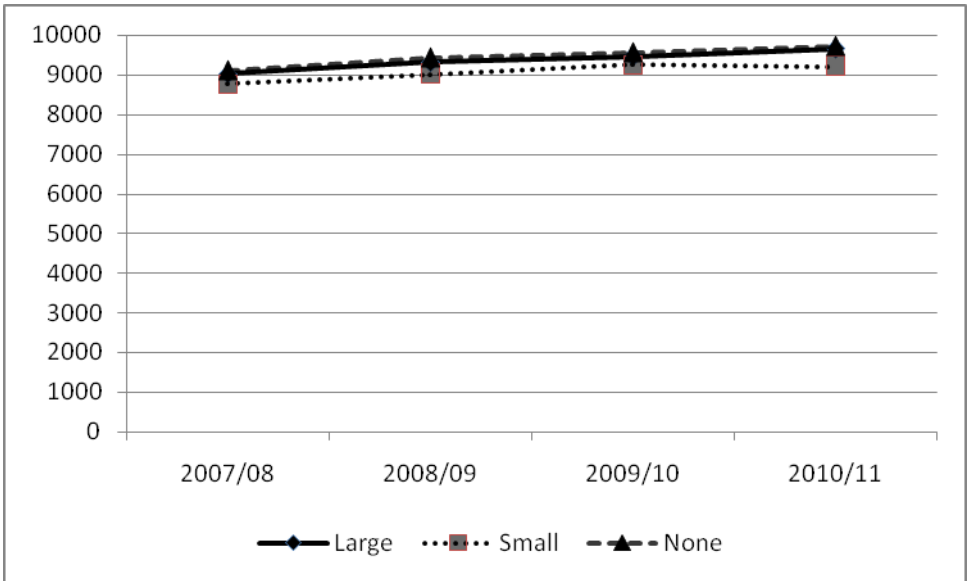
Table 5.3 Effect on CHD emergency admissions of investment of £10 per CHD patient in the PCT

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within a year for 2008/9 initiatives	7,13	-7.1 (-29.7, 15.5)	0.539	-7.2 (-33.0, 18.6)	0.588
Within two years for 2008/9 initiatives	14,13	4.2 (-6.6, 15.0)	0.447	4.6 (-6.4, 15.6)	0.408
Within a year for 2009/10 initiatives	3,40	-7.5 (-48.9, 33.9)	0.718	-2.7 (-45.5, 40.1)	0.900
Within two years for 2008/9 and a year for 2009/10 initiatives	17,10	1.7 (-3.7, 7.1)	0.532	3.2 (-2-2, 8.6)	0.247

5.3.4 All emergency admissions (EUCS)

A large number of PCTs invested to reduce emergency admissions overall. 29 PCTs made investments during 2008/9 or 2009/10 with the main outcome of reducing emergency admissions overall within one or two years. Most investments were large (>£1.50 per head of PCT population). In our sample, PCTs making large investments had similar directly standardised rates at baseline to those making no investment (Figure 5.4), and rates increased over time regardless of size of investment. PCTs making large or no investments had identical rates of admissions over time, with some indication of a slower rate of increase for PCTs making small investments (Figure 5.4).

Figure 5.4 Directly standardised emergency admission rates for PCTs with large, small or no investments between 2008/9 and 2009/10



When we tested the effect of 'size of initiative investment' as a continuous variable, the direction of effect indicated a reduction in admissions within a year but this was not statistically significant (Table 5.4).

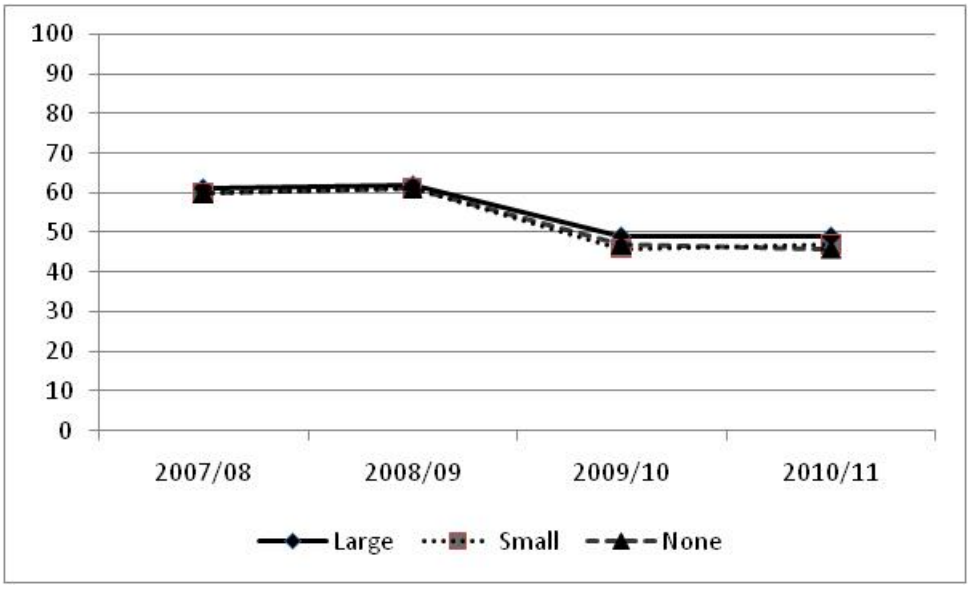
Table 5.4 Effect on emergency admissions of investment of £10 per head of population

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within a year for 2008/9 initiatives	19,14	-128 (-955, 699)	0.755	-137 (-962, 687)	0.735
Within two years for 2008/9 initiatives	19,14	88 (-1228,1405)	0.892	112 (-1300, 1524)	0.872
Within a year for 2009/10 initiatives	12,29	90 (-388, 568)	0.705	74 (-423, 571)	0.763
Within two years for 2008/9 and a year for 2009/10 initiatives	29,7	32 (-492, 556)	0.902	26 (-547,601)	0.926

5.3.5 GOOD control of diabetes (HbA1c <7 or 7.5)

Unfortunately there were changes to this QOF indicator in 2009/10, changing from the percentage of diabetes patients with HbA1c <7.5 within a PCT in 2007/8 to <7.0 in 2009/10 (see Figure 4.9). Therefore caution is needed when interpreting the results below. A large number of PCTs – 23 - invested to improve diabetes control within two years. Figure 5.5 shows that PCTs in our sample started at the same baseline regardless of whether they made large, small or no investments to improve control of diabetes in 2008/9 or 2009/10. There was some evidence that the 14 PCTs making large investments became the best performers by 2010/11. By 2010/11 the average percentage of people with good control of diabetes was 49% in PCTs with large investments, 47% in PCTs with small investments, and 46% in PCTs with no investments.

Figure 5.5 Change over time in % of diabetes patients with good control by PCTs with large, small or no investments between 2008/9 and 2009/10



When we tested the effect of 'size of initiative investment' as a continuous variable we found that the direction of effect indicated a larger improvement occurred over time in PCTs making investments. The effect size was larger at two years than one year. There was a cumulative effect of investment which resulted in a statistically significant increase of half a percentage point for every £10 spent per person with diabetes in the PCT during 2008/9 and 2009/10 (Table 5.5).

Table 5.5 Effect on GOOD control of HbA1c of investment of £10 per head of diabetes population

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within a year for 2008/9 initiatives	14,17	0. 47 (-0. 5,1.4)	0.347	0.45 (-0.7,1.5)	0.415
Within two years for 2008/9 initiatives	17,17	0.74 (-0.04, 1.5)	0.073	0.67 (-0.21,1.5)	0.142
Within a year for 2009/10 initiatives	7,55	0.27 (-0.20, 0.75)	0.261	0.36 (-0.14,0.86)	0.151
Within two years for 2008/9 and a year for 2009/10 initiatives	23,12	0.46 (0.06, 0.86)	0.032	0.50 (0.1, 0.9)	0.023

5.3.6 MODERATE control of diabetes (HbA1c <10 or 9)

The QOF indicator changed in 2009/10, with tougher targets of <9.0 set for 2009/10 compared with previous years of a target of <10.0 (See Figure 5.6). Again, this means that caution is needed when interpreting the results below. Figure 5.6 shows that for our sample, even at baseline, the mean percentage of people with diabetes who had moderate control of HbA1c was high (87%). In our sample, all three groups of large, small and no investing PCTs started at the same baseline and ended in the same place. The direction of effect indicated an improvement but there were no statistically significant effects of investment on moderate blood glucose control (Table 5.6).

Figure 5.6 Change over time in % of diabetes patients with moderate control by PCTs with large, small or no investments between 2008/9 and 2009/10

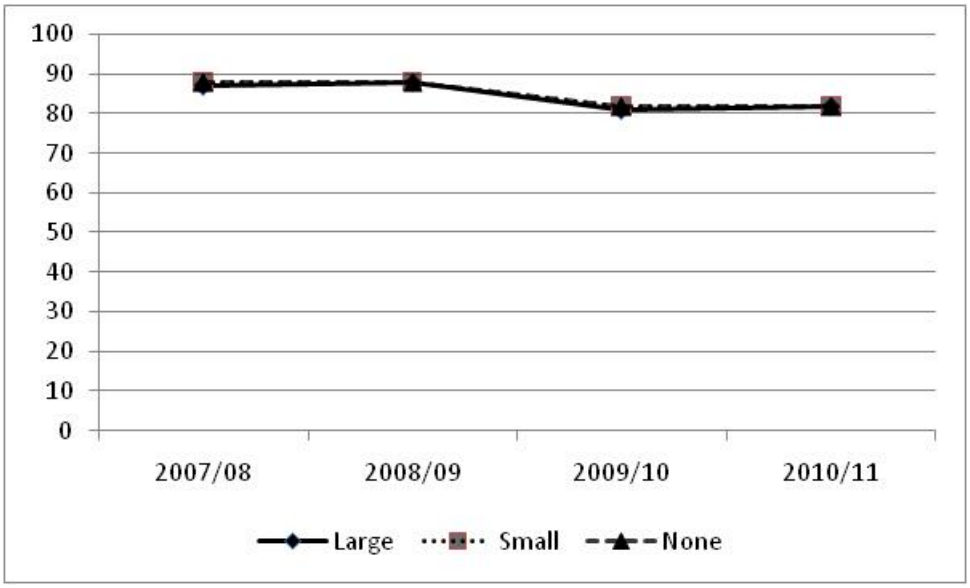


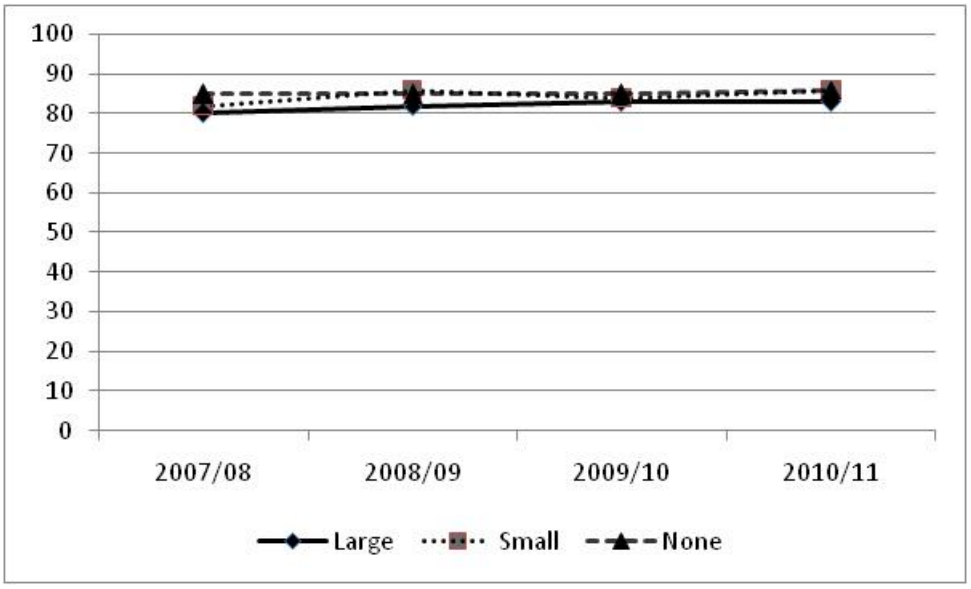
Table 5.6 Effect on MODERATE control of HbA1c of £10 investment per diabetes patient

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within a year for 2008/9 initiatives	14,17	0. 2 (-0.38, 0.42)	0.912	0.08 (-0.4, 0.56)	0.741
Within two years for 2008/9 initiatives	17,17	0.08 (-0.24, 0.4)	0.606	0.16 (-0.2, 0.52)	0.575
Within a year for 2009/10 initiatives	7,55	0.1 (-0.2, 0.4)	0.248	0.1 (-0.2, 0.4)	0.302
Within two years for 2008/9 and a year for 2009/10 initiatives	23,12	0.1 (-0.04,0.24)	0.094	0.1 (-0.04, 0.24)	0.148

5.3.7 Retinopathy screening

Only six PCTs invested extra money in an initiative where the main outcome was to increase the proportion of people undergoing retinal screening in the time periods we were studying (Table 5.7). In our sample, PCTs making investments started off being marginally worse than those not making investments (Figure 5.7).

Figure 5.7 Change over time in % of diabetes patients who had retinal screening by PCTs with large, small or no investments between 2008/9 and 2009/10



Due to small numbers of PCTs investing in initiatives with this as a main outcome, we only report the cumulative analysis. There was no evidence of an effect of investment (Table 5.7).

Table 5.7 Effect on % undergoing retinal screening of £10 investment per diabetes patient

	No of PCTs initiative, none	Unadjusted beta coefficient (95%CI)	p-value	Adjusted beta coefficient (95%CI)	p-value
Within two years for 2008/9 and a year for 2009/10 initiatives	6,12	-1.0 (-2.7, 0.7)	0.251	0.14 (-2.4, 2.7)	0.911

5.3.9 Exploration of whether initiatives were evidence-based

Towards the end of our study, a series of systematic reviews was published about the effectiveness of interventions to reduce emergency admissions (Purdy et al, 2012). The conclusion of these reviews was that for many interventions there was insufficient or limited evidence of effectiveness. We thought it would be interesting to use this review to assess the extent to which initiatives invested in by PCTs in our study, which commissioners expected to reduce emergency admissions as a primary outcome within two years, had a positive evidence base. We searched for similar reviews for our diabetes outcomes and found a meta-analysis of the effect of 11 distinct strategies on improving glycaemia control in adults with type 2 diabetes (Shojania et al, 2006). We used these reviews to assess the extent to which initiatives in our study had a positive evidence base, and therefore would be expected to produce outcomes. Interpretation was required because our survey respondents did not describe initiatives using terms from the reviews. For example, we had to group some types of initiatives in our study which were hard to distinguish in terms of being case management or increases in specialist and community staff.

Emergency admissions

The series of reviews of interventions for reducing overall (rather than disease or age specific) emergency admissions identified few successful interventions (Purdy et al, 2012). Therefore it is unsurprising that none of the emergency and urgent care initiatives that our PCTs invested in had a positive evidence base (Table 5.8). Our PCTs had mainly invested in case management/specialist clinics/community interventions and emergency department interventions, all of which have an insufficient evidence base under experimental conditions. Therefore it is unsurprising that we found no evidence of an effect on overall emergency admissions in our analysis. For CHD, there was a positive evidence base for case management/specialist clinics/community interventions for heart failure and 10/14 of our PCTs had invested in these types of initiatives. Unfortunately many of our PCT initiatives did not specify that they focused on heart failure so there was uncertainty about whether we could expect to see an effect on CHD emergency admissions. For COPD, there was a positive evidence base for pulmonary rehabilitation which 7/28 of our PCT initiatives invested in. Therefore we might have expected to see some effect on COPD emergency admissions for this sub-group of initiatives but there was no evidence of this in our data.

HbA1c

Case management/primary team care changes have a positive evidence base (Shojania et al, 2006) and 6/17 PCTs (35%) had invested in them (Table 5.9). Therefore we might have expected to see an improvement in this outcome for this sub-group of initiatives. We found evidence of a larger improvement over time in this sub-group compared with controls and other types of interventions, although it was not statistically significant due to the small numbers of PCTs. It was also the case that 3 of the 8 larger investments in Figure 5.5 involved increases in community and primary care staff.

One criticism of Table 5.9 is that the existing evidence base does not include up to date evidence that PCTs in our study may have been acting upon. For example, the National Institute for Health and Clinical Excellence states that all PCTs should offer structured education programmes to people with type 2 diabetes (NICE, 2009) and indeed some of our PCTs were investing in education and self management. However these types of interventions have had little effect (Davies et al, 2008), or variable effect (Loveman et al, 2008), on reported blood glucose measure. Improvements in other lifestyle outcomes have been observed in research studies, e.g. weight loss and smoking cessation, which we were unable to measure in our study due to lack of availability of relevant data. This exercise also highlighted that our attribution of some interventions to having an expected outcome of reduction in HbA1c may have been problematic.

Table 5.8 The research evidence base for initiatives starting in 2008/9 with reduction in emergency admissions as primary outcome within two years

Types of interventions in Purdy et al's review	Evidence base	Numbers of PCTs
All		N=19*
Case management/Specialist clinics/Community interventions	No effect or insufficient evidence	12
Care pathways and guidelines	Insufficient evidence	1
Medication review	No effect	0
Education and self management	Positive effect	0
Exercise and rehabilitation	Positive effect for some conditions	0
Telemedicine	Positive effect but poor quality base	0
Vaccine programs	No effect	0
Hospital at home	Negative effect	1
Finance schemes	Insufficient evidence	0
Emergency department change	Insufficient evidence	9
Continuity of care	Insufficient evidence	0
For **CHD** including heart failure		N=14
Case management/Specialist clinics/Community interventions	**Positive/Limited effect (heart failure)**	**10**
Medication review	No effect	0
Education and management	Weak evidence (heart failure)	0
Exercise and rehabilitation	**Positive (Exercise cardiac rehab)**	**1**
Telehealth	Positive effect	0
For **COPD**		N=28
Education and self management	Positive effect	0
Exercise and rehabilitation	**Positive effect (pulmonary rehabilitation)**	**7**
Case management	No effect	11
For **diabetes**		N=5
Telehealth	Positive effect	0

*Some initiatives had a number of components which overlapped with more than one intervention in a review

Table 5.9 The research evidence base for initiatives starting in 2008/9 with improvement in HbA1c as primary outcome within two years

Strategies in Shojania's review	Evidence base	Numbers of PCTs N=17
Primary health care team changes/ Case management (especially where medication changes could be made)	Positive effect	6 (0)
Clinician education	No effect	2
Patient education/self management	No effect	9
Audit and feedback, Electronic patient registry, Clinician reminders, Relay of information, Patient reminder systems, Continuous quality monitoring	No effect	0

5.3.10 Testing processes

There was only one statistically significant change associated with investment in commissioning initiatives: an improvement in GOOD glycaemic management. This finding was compromised by a change in measurement over time but nonetheless we measured the effect of different commissioning processes on obtaining this outcome. There were 23 PCTs with initiatives starting in 2008/9 or 2009/10 with this expected outcome (see Table 5.5). We tested the nine process variables described in Figure 3.4. There was no evidence that the outcome was dependent on reports commissioners gave of: who instigated the initiative (p=0.659); whether practice-based commissioning was involved in instigating the initiative (p=0.563); whether specialist clinicians were involved in developing and shaping the initiative (p=0.834); whether any GP was involved in developing and shaping the initiative (p=0.263); whether public health specialists were involved in developing and shaping the initiative (p=0.176); whether any PPI developed and shaped the initiative (p=0.884); the extent to which there had been assessment of need, cost and evidence (p=0.792); the level of leadership and management (p=0.804); or the extent of lack of barriers around disinvestment and competing priorities (p=0.813).

No processes had a statistically significant effect on outcomes. In Figures 5.8 and 5.9 we display two examples of change over time in the % of diabetes patients with GOOD glycaemic management in PCTs making investments with different processes. The numbers of PCTs in some sub-groups were small, making comparison between different processes difficult. Baseline positions sometimes differed by the process used to commission an initiative.

Figure 5.8 Change over time in % of diabetes patients with good control by PCTs making investments instigated by the PCT (n=15), practice-base commissioners (n=2) or other groups (n=6)

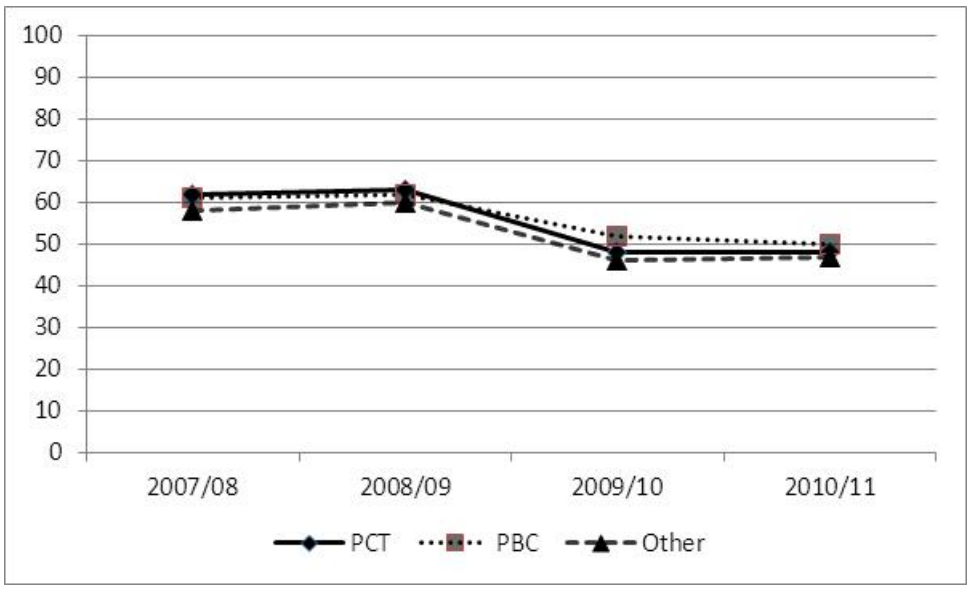
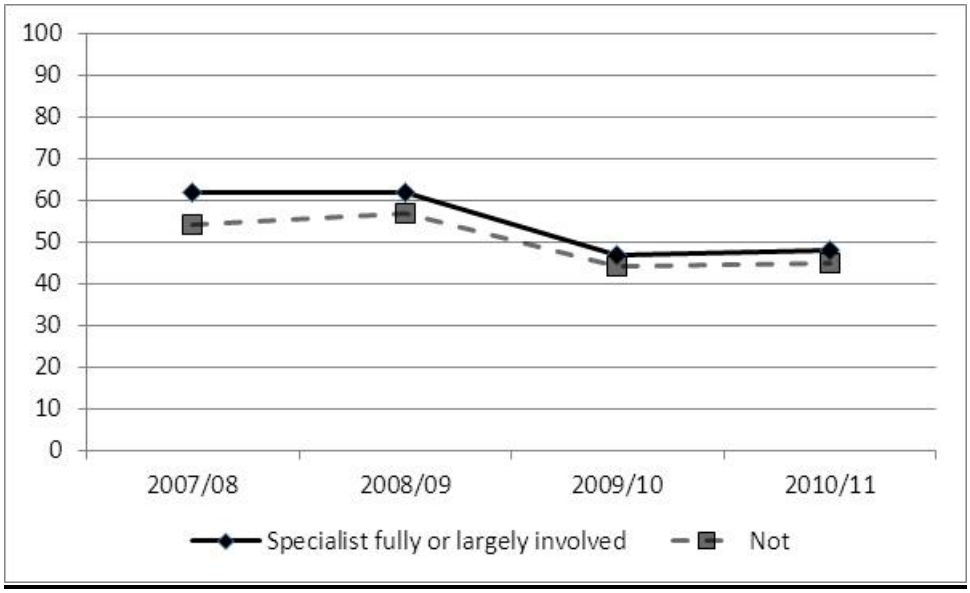


Figure 5.9 Change over time in % of diabetes patients with good control by PCTs making investments fully or largely shaped by diabetes clinical specialists (n=18) or not (n=3)



5.4 Implications for cost-effectiveness analysis

There was an indication that a marginal increase of £10 per diabetes patient per year in a PCT produced half a percentage point improvement in the percentage of diabetes patients with HbA1c< 7.0.

6. COST EFFECTIVENESS OF COMMISSIONING INITIATIVES

6.1 Aims and objectives

To consider the cost-effectiveness of effective investments identified in Chapter 5.

6.2 Methods

Commissioners were asked about the marginal costs of initiatives during the telephone interviews. The consequences of the initiatives in terms of changes in health outcomes and service utilisation were measured in the analysis in Chapter 5. Only one outcome was statistically significant: a half % point increase in the % PCT diabetes patients with HbA1c<7.0 for every £10 invested per year per diabetes patient. We estimate the cost-effectiveness of this using a model developed in ScHARR for type 2 diabetes to estimate the cost-effectiveness of different interventions (Gillett et al, 2010 web extra).

6.2.1 The Sheffield diabetes model

The model works at the individual patient level and replicates patients' risk of progression through five co-morbidities: retinopathy, nephropathy, neuropathy, coronary heart disease, and cerebrovascular disease. The model includes smoking status, HbA1c level, lipid concentration, blood pressure, diabetic complications, mortality, effects of hypoglycaemic attacks and weight. The time spent by patients in each state for each comorbidity is recorded—for example, years spent on dialysis, severe vision loss—together with transitions between states. The effects of treatments on complications are modelled either via a relative risk or the effect on underlying risk factors. Complications are driven by individual demographic and modifiable characteristics at each time period, and the model includes diabetes and other-cause mortality. Total costs are obtained by adding the costs of therapy, the costs of one off treatments (for example, cost of amputation), and the cost of ongoing treatment of complications (for example, treatment following stroke). The health benefit - the incremental quality adjusted life years - is obtained by applying quality of life measures to the time spent in the various diabetic health states. Cost effectiveness estimates for potential interventions are obtained by dividing the total costs by the incremental quality adjusted life years (taken from Gillett et al, 2010 web extra).

6.2.2 Assumptions for our study

The data from our study were not typical of the individual level data required for the model. We had to make a number of assumptions.

1. The 'before' and 'after' results do not relate to exactly the same cohort of patients, because some patients will have died during the four-year period, whilst others will have been newly-diagnosed with diabetes. We therefore assumed that the effect would be the same if the results related to a cohort of monitored individuals.

2. The model addresses type 2 diabetes and our initiatives and the QOF data encompasses type 1 as well as type 2. However, type 2 diabetes accounts for 90% of diabetes patients in the UK (http://www.diabetes.org.uk/Documents/Reports/Diabetes-in-the-UK-2012.pdf, accessed 13/9/12).

3. The model is an integrated individual level simulation model and our study findings were at PCT rather than individual level.

4. An ongoing investment of £10 per patient is made and the difference in HbA1c between the two groups of PCTs is sustained indefinitely.

5. The cost-effectiveness model requires that an individual's HbA1c and other relevant characteristics are specified. Other baseline characteristics were generated from the distributions in Table 1 of the CARDS study (Thomason et al, 2004).

6. Average duration of diabetes for individuals in the model was 8 years (based on Skylar et al, 2009).

7. No other changes in risk factors associated with diabetes-related outcomes are produced by the investment (e.g. better blood pressure control or reduced smoking prevalence).

6.2.3 Analysis

The data from Chapter 5 are summarised in Table 6.1. In order to evaluate the cost-effectiveness of the investment it was necessary to estimate the difference in the change in HbA1c between the investment and non-investment group. It is impossible to know the precise form of the change in distribution of HbA1c, i.e. whether the change in proportions was due to a small number of individuals crossing the lower HbA1c threshold, or a more overall shift in the distribution. The available data lends itself to modelling the latter so we assumed a lognormal distribution, fitted it to the data in Table 6.1, and obtained summary statistics for use in our model (Table 6.2).

Table 6.1 Change in distribution of HbA1c in PCTs making marginal investments versus those not

		Good control	Moderate control	Poor control
PCTs that invested in 2008/9 and/or 2009/10 N=23	2007/8 (before)	<=7.5 **61%**	>7.5 and <=10.0 27%	>10.0 12%
	2010/11 (after)	<=7.0 **48%**	>7.0 and <=9.0 34%	>9.0 18%
PCTs that did not invest N=12	2007/8 (before)	<=7.5 **60%**	>7.5 and <=10.0 28%	>10.0 12%
	2010/11 (after)	<=7.0 **46%**	>7.0 and <=9.0 36%	>9.0 18%

Table 6.2 Summary statistics of the log-normal distributions fitted to the HbA1c data

		Estimated summary statistics		Lognormal parameters	
		Mean	Standard Deviation	Mean	Standard Deviation
Investment PCTs	2007/8	7.220	2.380	1.93	0.32
	2009/10	7.337	1.943	1.96	0.26
	Mean change	0.117	0.447		
Non-investment PCTs	2007/8	7.276	2.328	1.94	0.31
	2009/10	7.400	1.860	1.97	0.24
	Mean change	0.123	0.478		

The investment and non-investment PCTs had a slightly different baseline distribution of HbA1c scores: 61% versus 60% with HbA1c below 7.5%. Therefore, adjustments were made to account for the differences at baseline. We sampled values for the change in the non-investment group from the log-normal distribution, and applied the change to sampled values from the baseline investment group. This provided an estimate of what the 2009/10 HbA1c scores would be for the investment group if they had not invested. We sampled HbA1c scores for patients entering the cost-effectiveness model for the investment group and non-investment group using the lognormal distribution (Table 6.3), transforming values back to give HbA1c levels. The *absolute* difference in the mean HbA1c for the investment versus non-investment PCTs was very small: 0.0065% (lower for the investment PCTs).

Table 6.3 Summary statistics of HbA1c adjusted for differences in 2007/8

		Estimated summary statistics	
		Mean	Standard Deviation
Investment PCTs	2007/8	7.220	2.380
	2009/10	7.337	1.943
Non-investment PCTs	2007/8	7.220	2.380
	2009/10	7.343	1.911

6.3 Results

The aggregate lifetime discounted cost of the investment was £124 per patient. The lifetime cost impact of investment on medication use and treating diabetes-related complications was a saving of £3 giving a net cost increase of £121. The lifetime gain in Quality-Adjusted life Years (QALYs) was 0.00056, giving a cost-effectiveness ratio of £217,300 which is highly unfavourable compared to the conventional willingness-to-pay threshold of £20,000 per QALY.

There is considerable uncertainty around values for parameters in the economic model and probabilistic sensitivity analysis indicated a 16% chance that the investment was cost-effective (i.e. a 16% chance that the cost-effectiveness ratio is below £20,000).

6.4 Conclusions

Given the assumptions made, a recurrent investment of £10 per diabetes patient is unlikely to be cost-effective. The approach used to fit lognormal distributions for HbA1c assumed a general shift in the distribution to the left from baseline over the four years. This may not be the case; it could be that some individuals make larger improvements than those implied by the fitted distribution but this is impossible to determine without individual level data. Finally, it is possible that the investments could have multiple effects on the behaviour of diabetes patients which, when taken in combination, could make the investment more cost effective. Gillett et al (2010) showed that a structured education programme with marginal effectiveness in terms of HbA1c was cost-effective when changes in smoking status, blood pressure and other risk factors were also considered.

7. DISCUSSION

7.1 Summary of findings

We measured the effect of marginal investments made by PCT commissioners in long term conditions and emergency and urgent care. PCTs made marginal investments in a wide range of initiatives with a variety of expected outcomes, expected in both the short and longer term. Very few of these outcomes could be measured using robust routine data available at PCT level. However, two of the most frequently expected outcomes by commissioners were a reduction in emergency admissions and improvements in disease specific outcomes and we were able to measure changes in these over time. The most robust outcome measure we found was emergency admissions for different conditions calculated using HES; this was relevant to a large percentage of initiatives. We found no evidence of a reduction in emergency admissions associated with initiatives in our study. Our key source of routine data about disease specific outcomes - QOF - changed how indicators were measured each year, making comparisons over time difficult. We found evidence of an improvement in good HbA1c control for diabetes, with a half percentage point increase in the percentage of diabetes patients with good control (HbA1c <7.5 or 7.0) for every £10 invested per diabetes patient per year. However, this finding was potentially compromised by a change in how the outcome was measured over time. In a cost-effectiveness model this size of change for this size of investment was unlikely to be cost-effective.

Commissioners reported using some commissioning processes more than others when making the marginal investments reported in our study. Most commissioning initiatives were reported as having clinical input, mainly from specialists and GPs usually involved in the PCT rather than the main body of GPs. Initiatives were much less likely to have had patient and public involvement according to commissioner reports, especially engagement from the general public. There was little reported involvement of Strategic Health Authorities or Local Authorities. Most commissioners reported using needs assessments and evidence, and having good leadership and management for commissioning initiatives. A large minority reported facing barriers around disinvestment and competing priorities of relevant stakeholders. Reported commissioning processes did not change much between 2008/9 and 2009/10 with the exceptions that instigation of commissioning initiatives shifted from being mainly undertaken alone by PCTs to being a group activity involving PCTs, practice-based commissioners and others such as service providers, and commissioners reported involving patients and the public in more of their commissioning initiatives in 2009/10 than 2008/9. Reported commissioning processes such as different levels of patient engagement in the development of initiatives did not affect the outcomes of commissioning initiatives.

7.2 Putting findings in the context of other research

7.2.1 Outcomes

There is limited evidence about the effect of commissioning on outcomes, particularly health outcomes (Miller et al, 2012; Smith & Curry, 2011). Miller et al (2012) found no evidence which attempted to measure the effect of commissioning on clinical outcomes such as blood glucose levels in diabetes. Therefore our study is unique in that aspect, and identifies limited evidence of an effect of PCT commissioning on a clinical outcome. There is evidence that one model of commissioning – Total Purchasing Pilots - reduced emergency admission bed days (Miller et al, 2012) which appears

to conflict with our finding that there was no effect of PCT commissioning investments on emergency admission rates. The different results might be explained by our focus on admission rates rather than bed days (which also includes length of stay). It is interesting to note that Miller et al (2012) point out that a minority of Total Purchasing Pilots had a sustained priority of impacting on emergency admissions, with some abandoning it as a priority, possibly due to it being difficult to achieve. A recent systematic review shows that a large number of initiatives aimed at reducing emergency admissions have a limited research evidence base or have been shown not to work (Purdy et al, 2012).That is, PCT commissioners in our study were trying to address a problem where there is a large but weak research evidence base.

There is evidence that historical commissioning models impacted on outcomes which we did not measure in our study. These include referrals to secondary care, prescribing costs and waiting times for elective treatment and outpatients (Miller et al, 2012).There is little evidence for PCT commissioning rather than historical models, although an exception is positive changes in outcomes such as smoking cessation and breast screening coverage which PCTs prioritised as part of world class commissioning (MHP, 2010). Imison & Naylor (2010) measured change in outpatient attendance rates over time in PCTs with referral management schemes versus those without and found no impact of PCTs introducing referral scheme initiatives.

Over the time period of our study there has been national activity to facilitate linking investment and outcomes for commissioners. The Department of Health commissioned the Association of Public Health Observatories to develop a tool which helps individual PCTs and CCGs to undertake an endeavour similar to ours by using Programme Budgeting data and prescribing data to link health outcomes and expenditure for a range of conditions: PCT CCG Spend and Outcome Factsheets and Tool (SPOT) (http://www.yhpho.org.uk/default.aspx?RID=49488, accessed 10/9/12). This allows commissioners to compare their spending and outcomes with other commissioning groups to plan change and monitor the effect of that change.

7.2.2 Processes

We identified the extent to which PCT commissioners *reported* using key processes when making marginal investments. They were much more likely to report having clinical involvement than patient involvement whilst developing these initiatives. The evidence we found of an increase in reported use of patient and public involvement in commissioning was also identified by the world class commissioning assurance exercises (NHS Confederation http://www.nhsconfed.org/Networks/PrimaryCareTrust/News/Pages/PCTWorldClassCommissioningAssuranceresults200910.aspx).

7.3 Strengths and limitations

7.3.1 Overall

The main strength of the study was that we attempted to measure the outcomes of commissioning investments in a large number of PCTs. It also proved to be a very difficult thing to do because of the lack of routine data to measure outcomes and their lack of consistent measurement over time. We discuss below some of the limitations of our research in terms of data collection about initiatives, routine data and analysis.

7.3.2 Collecting data on initiatives and processes

We attempted to collect data on specific initiatives: their content, the amount of money invested, exact start date, expected outcomes and timing of expected outcomes. The initiatives were often multi-component, the level of detail we required was sometimes not known by the commissioners we surveyed, or the detail was not known to individual commissioners due to recent job changes.

A strength of this study was the use of a telephone rather than a postal survey. Due to the complexity of the concept of 'commissioned initiatives' we were able to probe and clarify aspects of the initiative that would not have been possible using a postal or email survey. The survey also asked respondents to describe the commissioning processes related to a specific initiative rather than simply asking for descriptions of commissioning in general. The survey had three limitations:

Non-response bias

Although the response rates to our surveys were similar to other surveys of PCTs (Coleman et al, 2007) and better than others (Chisholm et al, 2007), there was non-response bias. PCTs with low ranking in the world class commissioning assurance exercise and larger deficits were underrepresented in our sample. This is likely to indicate that the picture of PCT commissioning presented here is more positive than in England as a whole because PCTs in a position to make marginal investments were more likely to participate in our study.

Reliance on commissioners' reports of initiatives

We relied on commissioners' reporting of initiatives. There were some problems with this. For example, some commissioners had been in post for a short time only, there may have been a lack of understanding of our requirement for the 'largest initiative', or underreporting of initiatives in previous years. This would be expected to reduce the chances of identifying a measurable effect if PCTs were misclassified as not having large initiatives in a specific area. Sometimes the person we interviewed did not know how much had been invested in an initiative, struggled to identify a single initiative given a large package of interventions instigated in different ways with different expected outcomes within their PCT that year, struggled to say that they expected a particular outcome as a main or secondary outcome, or were unsure when they expected to see an impact. This resulted in some missing data and a lack of data precision. However, we looked for alternative sources of the data we needed and concluded that speaking directly to the commissioners responsible for the relevant condition/service was the best approach. A pilot data collection exercise using the Annual Reports of three PCTs showed that not all investments reported in the survey were listed in these reports, suggesting this would be an incomplete source of information. We also explored the use of internet searches of PCT websites including links to board meeting minutes but this similarly did not identify the range of initiatives reported in the survey or the level of detail required. An alternative approach would have been for our research team to spend time in a small number of PCTs observing practice. For our study design we needed data on a large number of PCTs operating a large number of initiatives, some of which may have been planned and shaped over a number of years. For all the problems with relying on commissioners' reports of initiatives, it was the most feasible approach available and we were relying on reports from the people responsible for commissioning.

Reliance on commissioners' reports of commissioning processes

We relied on commissioners' reports of commissioning processes in a climate in which they were being formally assessed on the quality of commissioning. There was certainly an incentive to try to 'look good' by responding positively to the process variables. We do not believe this affected reporting bias too much because we reassured participants that responses would be anonymised, and some commissioners were willing to report a lack of involvement of important groups in commissioning initiatives. However, responses were subjective and may have differed between individual commissioners where the practice itself did not differ. There is also the issue of what 'to a large extent' means when exploring processes such as PPI involvement in developing and shaping an initiative. Survey respondents could have reported 'to a large extent' when in practice this involved presenting a fixed plan to a group with one PPI member or discussing needs with key PPI groups over a series of meetings. This is a limitation inherent in measurement scales.

7.3.3 Data on outcomes

We found very few robust routinely available outcome measures for PCTs over the time period of our study related to the many outcomes expected by commissioners. For example, some of our PCTs invested in education and self management training for type 2 diabetes as recommended by NICE because it can affect weight loss and smoking cessation (Davies et al, 2008). We could find no routine data at PCT level to measure these important outcomes. This means that our study potentially underestimates the impact of commissioning on outcomes because it did not include some important outcomes. This limitation was also identified by others attempting to measure the effect of PCTs prioritising to affect specific outcomes: "for many of the commonly selected indicators, national data were not available for the time period" (MHP, 2010 p.19) Consistency of measurement of outcomes proved to be a problem for some of the outcomes we could measure.

7.3.4 Study design and analysis

Many issues affect the outcomes which PCTs attempted to impact on. Our study design was strong in attempting to distinguish changes caused by PCT investment from changes caused by other issues. We assessed change over time in PCTs describing specific investments of specific sizes at specific time points for specific conditions with specific expected outcomes, and compared them with controls making no such investments, with removal of large previous investments which might affect the comparison. A similar design has been used by a research group studying the impact of financial incentives on hospital mortality and published in the New England Medical Journal (Sutton et al, 2012).

There were some limitations to our design and analysis. First, our original plan was to undertake an interrupted time series analysis over the time period 2004/5 to 2010/11 with the initiative under study as a 'step'. However, this was not feasible because we had not obtained detailed information about the size and timing of initiatives across the whole time period. Second, the approach we took paid attention to the short term effect of initiatives only. Some critics might argue that the timescale was too short for changes to have occurred. We argue that commissioners themselves invested money with the expectation of outcomes occurring within one or two years. In our analysis we have only selected investments where commissioners expected outcomes in the time period of our follow-up. Also, a study with an 18 month follow-up found a statistically significant reduction in hospital mortality (Sutton et al, 2012). Third, our analysis resulted in a large number of statistical tests and with a p-value of 0.05 we would expect 1 of the 24 reported unadjusted analyses to have occurred by chance. However, the positive finding with respect to diabetes is given some credence by the presence of a

reasonable evidence base relating to some of the initiatives used by commissioners. Fourth, there is a need to consider the possible impact of 'regression to the mean' if the rationale for a commissioning investment is that current outcomes are not as good as those achieved elsewhere. When presenting our findings, we have taken care to point out when our investing PCTs started at a higher baseline than our control PCTs so that readers can be alert to the potential for regression to the mean. For our positive finding about diabetes, investing and control PCTs started from the same baseline. Fifth, the analysis is undertaken at the PCT level with a small number of PCTs within each analysis resulting in low statistical power to detect differences, particularly if differences are small. A multi-level model including individual level data may have increased statistical power. However we chose a PCT level analysis because the intervention acted at this level. Sixth, our analysis focused on single outcomes, requiring a large effect on a single outcome. Some effects may be small but still clinically significant. Also, rather than having a large effect on a single outcome, the initiatives PCTs invested in may have had a small effect on multiple outcomes (Gillett et al, 2010). Indeed some outcomes further down the pathway of outcomes may be the most economically beneficial e.g. diabetes education programmes reduce smoking rates which cause longer term reductions in cardiovascular risk (Gillett et al, 2010). Finally, we did not assess the effect of initiatives on some outcomes because they were a main outcome of few initiatives e.g. health inequalities. Even if we had tried, the differences in QOF indicators between the least and most deprived general practices have almost disappeared over time (Dixon et al, 2011).

7.4 Reflections on measuring outcomes of commissioning initiatives

We detected little or no change in some frequently expected outcomes associated with specific PCT commissioning initiatives. There are three possible explanations for this finding:

1. These commissioning initiatives did not produce improved outcomes.

It may be unfair to conclude from our study that PCT commissioning initiatives did not produce improved outcomes because of some of the limitations we identified above with our study, particularly the limited numbers of outcomes measured. However, it is also the case that commissioners may be trying to affect some outcomes that are very important to them but which have a limited pool of effective interventions to draw on. This is most evident for the outcome of reducing emergency admissions; a review of 1530 controlled studies evaluating interventions to affect this outcome concluded there was insufficient or no convincing evidence to support most of them (Purdy et al, 2012).

2. Outcomes were produced and were potentially detectable but were not detected due to limitations in the available data to detect these changes.

This is a fair conclusion to draw from our study. We only measured a limited number of outcomes due to the lack of good quality routine data. However, we did measure emergency admission rates, a reduction in which was a key short term outcome for many of the commissioning initiatives.

3. Outcomes were produced but were not detectable due to the changes being small in multiple conflicting outcomes occurring in a constantly changing complex environment.

This perhaps is the most depressing conclusion – that it is simply not possible to detect changes in outcomes associated with commissioning initiatives of this type. The complexity of the pathways by which any investments are expected to have an impact on patient outcomes or service activity levels, and the likely interaction with many confounding factors, which also influence these outcomes, means that even if an investment has a relatively clear evidence base it is not possible to assume that the impact will be similar when replicated in a different setting or different population. Additionally, some outcomes may be in conflict as commissioners may need to trade off improved efficiency for improved access or equity (Dolan et al, 2003). This project provided an opportunity to explore the feasibility and potential for using a range of routine data for evaluation. There was no doubt that the amount of activity that occurs within commissioning over a number of years can be so large that it is difficult to untangle the effect of a single investment. Yet it is still an important thing to attempt to do given the investment the NHS makes in commissioning. A study using a similar design and routine data, looking at hospital payment for performance to reduce mortality of specific conditions rather than commissioning, compared mortality in 24 hospitals compared with 132 control hospitals (Sutton et al, 2012). They found an absolute reduction in mortality of 1.3% and a relative reduction of 6% during an 18 month period showing that it is possible to detect small differences in short time frames on outcomes likely to be affected by multiple issues.

7.5 Lessons for those measuring outcomes of commissioning

7.5.1 Transferability of findings to the new commissioning structures

New focus on disinvestment

We undertook our study at a time when many PCTs were receiving increasing resources and were able to invest in new initiatives. Our commissioners described few examples of disinvestments. In the near future, commissioners may be more focused on disinvestment given the increasing financial pressures they face in the economic downturn.

Continued interest in the same processes and outcomes

The commissioning model has changed from the PCTs studied here, but our study is still relevant to the new model. Commissioning in England from April 2013 will be undertaken nationally by the NHS Commissioning Board (NCB) and locally by Clinical Commissioning Groups (CCGs). However, the NCB will still focus on the commissioning processes we included in our study – patient and public involvement, clinical involvement and leadership, and partnership working (http://www.commissioningboard.nhs.uk/about/, accessed 20 February 2013). They will also be held to account for the performance of both national and local commissioning using the NHS Outcomes Framework (Department of Health, 2012a). The NHS Outcomes Framework 2013 to 2014 sets out the outcomes and corresponding indicators that will be used, and these include outcomes measured in our study such as reducing preventable emergency admissions for people with long terms conditions (Department of Health, 2012b). It is also the case that emerging CCGs have made small rather than large strategic changes, so the marginal changes which were the focus of our study are likely to continue for CCGs (Checkland et al, 2012).

7.5.2 Lessons about measuring outcomes and performance

1. The National Outcomes Framework is an important endeavour, and one which indicates the centrality within the new commissioning world of measuring the performance of commissioning in terms of health-related outcomes achieved. The National Outcomes Framework will measure change over time in a large number of indicators at national, regional and local level. These indicators are likely to shape the commissioning actions CCGs will take because CCGs will attempt to impact on them, but CCGs will also attempt to affect outcomes not measured in this Framework. CCGs may wish to provide evidence of effect on these other outcomes in addition to the national assessment, to offer a more comprehensive view of commissioning performance on outcomes.

2. Some indicators in the National Outcomes Framework will take many years to affect. For example, only 1% of commissioners in our study reported making marginal changes to reduce mortality as the main outcome expected within a year (see Table 3.4).

3. Some outcomes commissioners are attempting to achieve may be in conflict with each other (Dolan et al, 2003) and the NCB may wish to consider where this might be relevant within the National Outcomes Framework.

4. Individual CCGs are likely to prioritise making changes to some areas and this could be considered in the analysis of comparing the performances of CCGs. Measuring change over time in outcomes *related to commissioning decisions made* by a CCG is a challenging but important endeavour.

5. Data availability for some key outcomes was poor for this national study undertaken at PCT level. The National Outcomes Framework has identified where data are unavailable for their indicators at CCG level. Improving the quality, consistency and completeness of routine data should be a priority for agencies producing information used by the NHS Outcomes Framework. Consistent outcome measures need to be available over time and across different CCG populations. The value of QOF data, as a source of indicators of clinical outcomes, would be improved by maintaining consistent definitions and thresholds between successive years. However, it is also the case that more data are available locally than nationally, and available at general practice level, that are helpful for modelling the effect of local commissioning decisions (Spence et al, 2010) and could be used for evaluation of commissioning decisions.

6. Reduction in emergency admissions is likely to be a key outcome pursued by CCGs and there is good routine data available to measure change over a long time period for different conditions for all CCGs. The interventions attempted by CCGs should be informed by the evidence base so that they have a chance of being effective in the real world (Purdy et al, 2012), or if they are innovative should be evaluated to add to the evidence base.

7.6 Unmet objectives of the planned study

When planning this study we hoped to provide a vehicle for quantitative measurement of the effect of outcomes of issues identified in the cases studies of commissioning and health reforms in the wider Health Reform Evaluation Programme (HREP). We also planned to create a toolkit to allow HREP to continue to monitor the effects of commissioning initiatives on outcomes in the longer term. We

pursed neither of these issues because of the limited amount of quality routine data measured consistently over time and because investments in later years by both PCTs originally investing and originally not investing would contaminate any measurement of the longer term effect of the original investments.

7.7 Dissemination

Dissemination will take place through publication in peer-reviewed journals and presentations at conferences. Opportunities will be taken to disseminate the research formally and informally at events attended by policy makers, commissioners and researchers. For example, we attended a research seminar on healthcare commissioning organised by the Policy Research Unit in Commissioning and the Healthcare System in February 2013 and took the opportunity to discuss our research with someone from the National Outcomes Framework. During the study the following dissemination occurred:

7.7.1 Conferences and seminars

Sampson F, O'Cathain, Strong M, Pickin M, Dixon S, Goyder E. Have PCTs changed the way they commission? HSR Network and SDO joint annual conference: Delivering Better Health Services, Manchester England, UK, June 2010.

O'Cathain, Sampson F, Strong M, Pickin M, Dixon S, Goyder E. Evaluating PCT commissioning: identifying which commissioning processes produce successful outcomes. Research on Commissioning Seminar. Kings Fund, London, October 2010.

7.7.2 Publications

Sampson F, O'Cathain A, Strong M, Pickin M, Esmonde L. Commissioning processes in primary care trusts: A repeated cross sectional survey of health care commissioners in England. Journal of Health Services Research and Policy 2012, 17(Suppl 1):31—39.

7.8 Conclusions

Commissioners made investments with the aim of improving a wide range of outcomes. There is limited consistently measured routine data relevant to these outcomes. We found little or no impact on the limited number of outcomes we could measure – reduction in emergency admissions for diabetes, CHD, COPD and all conditions; and blood glucose management for diabetes. The most likely explanations for this null finding were a lack of evidence-based interventions for reducing emergency admissions and the challenges of identifying associations between complex PCT level interventions and changes in health outcomes.

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APPENDICES

Appendix 1: Copy of questionnaire for diabetes

For the person with special responsibility for commissioning for

DIABETES

ABOUT YOU

1. What is your position in the PCT?	Director of Commissioning	Commissioning manager with special responsibility for diabetes

2. How many years have you been in this position in your PCT ?	

ABOUT DIABETES IN YOUR PCT

3. Compared with the average for England, would you say that diabetes is more of a problem in your PCT, less of a problem, or about average?	MORE of a problem	LESS of a problem	AVERAGE

COMMISSIONING FOR DIABETES

4. Did you commission any changes to diabetes care in your PCT which **STARTED** in the financial year 2008/9?	No **GO TO Q9**	Yes, describe changes in your own words… What is it Who is it aimed at

5. What would you say was the total investment in all these initiatives? i.e. spend on changes	£

6. Can you say which change incurred the largest investment of money? ***(NOTE - The initiatives may be a 'package' which cannot be separated. If so, answer questions below about the package rather than the single largest investment)***	I've just described the package above. **GO TO Q8**	The single largest initiative is ….. …

7. How much did you invest in <u>this single initiative</u>?	£

8. Thinking back over the past **3 YEARS**, how does the investment in this single initiative (or package of initiatives if you cannot separate out the single largest one) compare with the size of investment in previous years?	I do not know	Typical	Larger than previous years	Smaller than previous years

If it is SMALLER …..

9. Is there a <u>single initiative</u> which **STARTED** in the past 3 years which you consider is the most significant change to diabetes care in your PCT in recent years?	No **GO TO Q11**	Yes, describe this change *What is it* *Who is it aimed at*

10. How much did you invest in <u>this initiative</u>?	£

11. We will ask questions below about the largest single investment you made in the last 3 years which YOU know about. Which initiative is that?	The one described in **Q4**	The one described in **Q6**	The one described in **Q9**

ABOUT THE INITIATIVE

12. Is the funding	Recurrent	Non-recurrent

13. What was the source of funding?	External funding	Standard PCT budget	Other, please say:

14. Do you know if there was a Business Case, or a document or paper presented to your Board, for this initiative?	YES	NO	I do not know

15. Have you got this Business Case/paper in front of you to help you answer questions?	YES	NO	Not applicable

16. Approximately what date did the initiative **START**? ***(NOTE – I do not mean when it was funded but when it actually started)***	

17. Does the initiative have an end date?	YES The end date is:	NO, it is ongoing

18. Is the initiative available 24/7 or for limited time periods within the week?	24/7	In hours only	Out of hours only	Other, please say:

19. Approximately how many <u>diabetes</u> patients in your PCT will the initiative help each year?	

20. Is it a PCT wide initiative or does it affect some general practices only?	PCT wide	Some practices only. Please say how many:

21. Were you hoping for any specific outcomes from this initiative?	**MAIN** outcome(s) *You may have only one or two of these*	**Secondary** outcome(s)	When would you expect to see this change? *1=immediately* *2=within one year* *3=within two years* *4= longer than two years*	What SIZE of change do you expect for the **MAIN** outcome(s)?
a. Reduction in emergency hospital admissions				
b. Reduction in hospital outpatient use				
c. Increase in hospital outpatient use				
d. Reduction in waiting times for outpatients				
e. Increase in access to care				
f. Increase in patient choice				
g. Improved disease-specific health outcomes				
h. Improved general health outcomes				
i. Reduction in mortality				
j. Reduction in health inequalities				
k. More efficient use of resources				
l. Improved financial stability for PCT				
m. Movement of care into the community				
n. Other, please say_____				

22. Do you know if a specific person or group instigated this initiative?	PCT	Practice based commissioners	Provider	Other, please say:

23. To what extent were any of the following groups involved in **DEVELOPING AND SHAPING** this initiative?	Not applicable	Not at all	To some extent	Largely	Fully
a. Diabetes clinicians					
b. GPs who are usually involved in the PCT e.g. on PEC					
c. Other GPs					
d. Local diabetes patients					
e. Diabetes patient organisation e.g. Diabetes UK					
f. General public					
g. PCT Public Health specialists					
h. Practice based commissioners					
i. Strategic health authority					
j. Local authority					
k. Other, please say:					

24. Here are some statements about the processes of commissioning used for this initiative	Strongly agree	Agree	Not relevant	Disagree	Strongly disagree
a. The initiative was developed from a similar one elsewhere					
b. A detailed needs assessment was undertaken by the PCT					
c. A search for research evidence of effectiveness was undertaken by the PCT					
d. Research evidence of effectiveness was found					
e. A detailed assessment was made of the cost of the					

initiative					
f. The Framework for procuring External Support for Commissioners (FESC) was used					
g. A set of performance management indicators is in use					
h. A PCT person has been designated as responsible for measuring performance					
i. The initiative remains a priority within the PCT senior management					
j. There has been continuity of management for this initiative in the PCT					
k. There has been enough leadership of this initiative through its development and implementation					
l. The need for the PCT to shift resources between providers has presented a barrier					
m. The need for the PCT to disinvest from some areas has presented a barrier					
n. All organisations involved have had the same priorities					
o. The need for multiple organisations to work together has presented a barrier					
p. Have you identified any other process important for the success of this initiative? Please say…..					

Thank you very much for your help. We really appreciate the time you have given us.

Appendix 2: HES calculations

Emergency hospital admissions

Directly and indirectly standardised admission rates by PCT were calculated using numbers of finished and unfinished continuous inpatient spells for patients of all ages in each financial year 2007/8-2010/11.

Data fields included

The following fields were requested:

1. ENDAGE
2. EXTRACT_HESID
3. SEX
4. ADMIDATE
5. ADMIMETH
6. ADMISORC
7. DISDATE
8. DISDEST
9. SPELDUR
10. EPIDUR
11. EPIORDER
12. EPISTAT
13. PROVSPNO
14. DIAG_01 (3CHAR)
15. DIAG_01 (4CHAR)
16. CLASSPAT
17. MAINSPEF
18. DOMPROC
19. HRGLATE
20. HRGLATE35
21. PROCODE
22. PROCODET
23. RESPPCT02
24. RESPCT06
25. SOAL
26. IMD04RK

27. GPPRAC
28. EPIKEY

HES data definitions

HES data on finished consulted episodes (FCE) for all emergency admissions was acquired for 2007/8 to 2010/11. Emergency admissions were defined as any admissions where the admission method field began with '2'. This included Emergency via A&E, via GP, via bed bureau, via consultant outpatient clinic and via other means (ADMINMETH=21,22,23,24,28). The length of stay for each spell of care was calculated and appended to the record of admission FCE. The first FCEs were selected so that there would be only one record per patient spell (though the same patient may appear more than once in the data) (EPIORDER=1).

Excluded data

Exclusion criteria were as follows: not first episode in the spell (i.e. episode number >1), date of discharge missing or unknown, duplicate record, patient not resident in PCT in England or PCT of residence unknown, gender missing, age missing. Duplicate records were defined as matching HES id, admission date, discharge date, main speciality and episode order. Where duplicates were identified, the episode with highest episode identifier (EPISTAT) was retained. Numbers excluded by year are detailed below:

Year	Total FCEs	Episode order >1	Admission / discharge date missing	Duplicate	PCT code non-England	Gender missing	Age missing	Total remaining
2007/8	6,415,334	1,654,949	40,030	7,987	80,062	307	3,982	4,628,017
2008/9	6,858,019	1,840,630	39,685	3,492	66,354	302	7,743	4,899,813
2009/10	7,201,775	2,015,893	72,477	2,456	60,831	188	7,368	5,042,562
2010/11	7,408,560	2,114,314	70,054	931	61,630	212	8,024	5,153,395

Appendix 3: Summary of QOF measures

	DIABETES	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11
1	The practice can produce a register of patients with diabetes mellitus	x	x					
2	The percentage of patients with diabetes whose notes record BMI in previous 15 months	x	x	x	x	x	x	x
3	The percentage of patients with diabetes in whom there is a record of smoking status in the previous 15 months, except those who have never smoked where smoking status should be recorded once	x	x					
4	The percentage of patients with diabetes who smoke and whose notes contain a record that smoking cessation advice or referral to a specialist service, where available, has been offered in the last 15 months	x	x					
5	The percentage of patients with diabetes who have a record of HbA1c or equivalent in the previous 15 months	x	x	x	x	x	x	x
6	**The percentage of patients with diabetes in whom the last HbA1c is 7.4 or less in previous 15 months**	**x**	**x**					
7	**The percentage of patients with diabetes in whom the last HbA1c is 10 or less in previous 15 months**	**x**	**x**	**x**	**x**	**x**		
8	**The percentage of patients with diabetes who have a record of retinal screening in the previous 15 months**	**x**	**x**					
9	The percentage of patients with diabetes with a record of the presence or absence of peripheral pulses in the previous 15 months	x	x	x	x	x	x	x
10	The percentage of patients with diabetes with a record of neuropathy testing in the previous 15 months	x	x	x	x	x	x	x
11	The percentage of patients with diabetes who have a record of the blood pressure in the previous 15 months	x	x	x	x	x	x	x

12	The percentage of patients with diabetes in whom the last blood pressure is 145/85 or less.	x	x	x	x	x	x	x
13	The percentage of patients with diabetes who have a record of micro-albuminuria testing in the previous 15 months (exception reporting for patients with proteinuria).	x	x	x	x	x	x	x
14	The percentage of patients with diabetes who have a record of serum creatinine testing in the previous 15 months	x	x					
15	The percentage of patients with diabetes with a diagnosis of proteinuria or micro-albuminuria who are treated with ACE inhibitors (or A2 antagonists)	x	x	x	x	x	x	x
16	The percentage of patients with diabetes who have a record of total cholesterol in the previous 15 months	x	x	x	x	x	x	x
17	The percentage of patients with diabetes whose last measured total cholesterol within the previous 15 months is 5mmol/l or less.	x	x	x	x	x	x	x
18	The percentage of patients with diabetes who have had influenza immunisation in the preceding 1 September to 31 March.	x	x	x	x	x	x	x
19	The practice can produce a register of all patients aged 17 years and over with diabetes mellitus, which specifies whether the patient has Type 1 or Type 2 diabetes			x	x	x	x	x
20	**The percentage of patients with diabetes in whom the last HbA1c is 7.5 or less in previous 15 months**			**x**	**x**	**x**		
21	**The percentage of patients with diabetes who have a record of retinal screening in the previous 15 months**			**x**	**x**	**x**	**x**	**x**
22	The percentage of patients with diabetes who have a record of estimated glomerular filtration rate (eGFR) or serum creatinine testing in the previous 15 months.			x	x	x	x	x
23	**The percentage of patients with diabetes in whom the last HbA1c is 7 or less (or equivalent test/reference range depending on local laboratory) in the previous 15 months**						**x**	**x**

24	The percentage of patients with diabetes in whom the last HbA1c is 8 or less (or equivalent test/reference range depending on local laboratory) in the previous 15 months						x	x
25	**The percentage of patients with diabetes in whom the last HbA1c is 9 or less (or equivalent test/reference range depending on local laboratory) in the previous 15 months**						**x**	**x**

	COPD	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11
1	The practice can produce a register of patients with COPD	x	x	x	x	x	x	x
2	The percentage of patients in whom diagnosis has been confirmed by spirometry including reversibility testing for newly diagnosed patients with effect from 1 April 2003	x	x					
3	The percentage of all patients with COPD in whom diagnosis has been confirmed by spirometry including reversibility testing	x	x					
4	The percentage of patients with COPD in whom there is a record of smoking status in the previous 15 months	x	x					
5	The percentage of patients with COPD who smoke, whose notes contain a record that smoking cessation advice or referral to a specialist service, where available, has been offered in the past 15 months	x	x					
6	The percentage of patients with COPD with a record of FeV1 in the previous 27 months	x	x					
7	The percentage of patients with COPD receiving inhaled treatment in whom there is a record that inhaler technique has been checked in the preceding 27 months	x	x					
8	The percentage of patients with COPD who have had influenza immunisation in	x	x	x	x	x	x	x

	the preceding 1 September to 31 March							
9	**The percentage of all patients with COPD in whom diagnosis has been confirmed by spirometry including reversibility testing**			**x**	**x**			
10	**The percentage of patients with COPD with a record of FeV1 in the previous 15 months**			**x**	**x**	**x**	**x**	**x**
11	The percentage of patients with COPD receiving inhaled treatment in whom there is a record that inhaler technique has been checked in the previous 15 months			x	x	x		
12	**The percentage of all patients with COPD diagnosed after 1st April 2008 in whom the diagnosis has been confirmed by post bronchodilator spirometry**					**x**	**x**	**x**
13	The percentage of patients with COPD who have had a review, undertaken by a healthcare professional, including an assessment of breathlessness using the MRC dyspnoea score in the preceding 15 months. (P)						x	x

	CHD	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11
1	CHD 1. The practice can produce a register of patients with coronary heart disease	x	x	x	x	x	x	x
2	CHD 2. The percentage of patients with newly diagnosed angina (diagnosed after 1 April 2003) who are referred for exercise testing and/or specialist assessment	x	x	x	x	x	x	x
3	CHD 3. The percentage of patients with coronary heart disease whose notes record smoking status in the past 15 months, except those who have never	x	x					

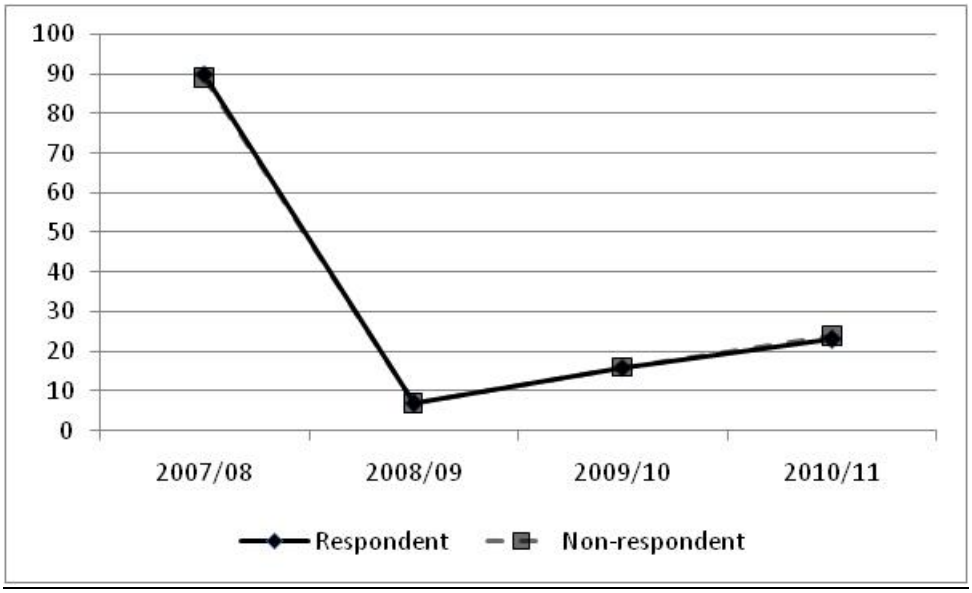
	smoked where smoking status need be recorded only once							
4	CHD 4. The percentage of patients with coronary heart disease who smoke, whose notes contain a record that smoking cessation advice or referral to a specialist service, where available, has been offered within the last 15 months	x	x					
5	CHD 5. The percentage of patients with coronary heart disease whose notes have a record of blood pressure in the previous 15 months	x	x	x	x	x	x	x
6	CHD 6. The percentage of patients with coronary heart disease in whom the last blood pressure reading (measured in the last 15 months) is 150/90 or less	x	x	x	x	x	x	x
7	CHD 7. The percentage of patients with coronary heart disease whose notes have a record of total cholesterol in the previous 15 months	x	x	x	x	x	x	x
8	CHD 8.The percentage of patients with coronary heart disease whose last measured total cholesterol (measured in last 15 months) is 5 mmol/l or less	x	x	x	x	x	x	x
9	CHD 9. The percentage of patients with coronary heart disease with a record in the last 15 months that aspirin, an alternative anti-platelet therapy, or an anti-coagulant is being taken (unless a contraindication or side-effects are recorded)	x	x	x	x	x	x	x
10	CHD 10. The percentage of patients with coronary heart disease who are currently treated with a beta blocker (unless a contraindication or side-effects are recorded)	x	x	x	x	x	x	x
11	CHD 11. The percentage of patients with a history of myocardial infarction (diagnosed after 1 April 2003) who are currently treated with an ACE inhibitor or angiotensin II antagonist	x	x	x	x	x	x	x
12	CHD 12. The percentage of patients with coronary heart disease who have a record of influenza immunisation in the preceding 1 September to 31	x	x	x	x	x	x	x

	March							
HF:								
1	The practice can produce a register of patients with heart failure			x	x	x	x	x
2	The percentage of patients with a diagnosis of heart failure (diagnosed after 1 April 2006) which has been confirmed by an echocardiogram or by specialistassessment.			x	x	x	x	x
3	The percentage of patients with a current diagnosis of heart failure due to LVD who are currently treated with an ACE inhibitor or Angiotensin Receptor Blocker, who can tolerate therapy and for whom there is no contra-indication			x	x	x	x	x
4	The percentage of patients with a current diagnosis of heart failure due to LVD who are currently treated with an ACE inhibitor or Angiotensin Receptor Blocker, who are additionally treated with a beta-blocker licensed for heart failure, or recorded as intolerant to or having a contraindication to beta-blockers						x	x
PP1	In those patients with a new diagnosis of hypertension (excluding those with pre-existing CHD, diabetes, stroke and/or TIA) recorded between the preceding 1 April to 31 March: the percentage of patients who have had a face to face cardiovascular risk assessment at the outset of diagnosis (within three months of the initial diagnosis) using an agreed risk assessment tool						x	x
PP2	The percentage of people diagnosed with hypertension, diagnosed after 1 April 2009, who are given lifestyle advice in the last 15 months for: increasing physical activity, smoking cessation, safe alcohol consumption and healthy diet						x	x

Also LVD, stroke & TIA, hypertension, 2008/9 Cardiovascular risk primary prevention

APPENDIX 4 Change in discarded COPD QOF outcomes over time

% diagnosed COPD in whom the diagnosis confirmed by post bronchodilator SPIROMETRY



% COPD with a record of FEV1 in the previous 15 months