

## Research and Theory

# Evaluation of UK Integrated Care Pilots: research protocol

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## Abstract

**Background:** In response to concerns that the needs of the aging population for well-integrated care were increasing, the English National Health Service (NHS) appointed 16 Integrated Care Pilots following a national competition. The pilots have a range of aims including development of new organisational structures to support integration, changes in staff roles, reducing unscheduled emergency hospital admissions, reduced length of hospital stay, increasing patient satisfaction, and reducing cost. This paper describes the evaluation of the initiative which has been commissioned.

**Study design and data collection methods:** A mixed methods approach has been adopted including interviews with staff and patients, non-participant observation of meetings, structured written feedback from sites, questionnaires to patients and staff, and analysis of routinely collected hospital utilisation data for patients/service users. The qualitative analysis aims to identify the approaches taken to integration by the sites, the benefits which result, the context in which benefits have resulted, and the mechanisms by which they occur.

**Methods of analysis:** The quantitative analysis adopts a ‘difference in differences’ approach comparing health care utilisation before and after the intervention with risk-matched controls. The qualitative data analysis adopts a ‘theory of change’ approach in which we triangulate data from the quantitative analysis with qualitative data in order to describe causal effects (what happens when an independent variable changes) and causal mechanisms (what connects causes to their effects). An economic analysis will identify what incremental resources are required to make integration succeed and how they can be combined efficiently to produce better outcomes for patients.

**Conclusion:** This evaluation will produce a portfolio of evidence aimed at strengthening the evidence base for integrated care, and in particular identifying the context in which interventions are likely to be effective. These data will support a series of evaluation judgements aimed at reducing uncertainties about the role of integrated care in improving the efficient and effective delivery of healthcare.

## Keywords

**integrated care, evaluation, protocol**

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## Background

There are growing numbers of people with chronic conditions with a particularly rapid rise in the number with multiple care needs. The complex needs of people with multiple chronic conditions require the development of delivery systems that bring together a range of professionals and skills from both the cure and care sectors to meet those needs. Despite this, service delivery has developed in ways that have tended to fragment care, both within and between sectors, through for example structural and financial barriers dividing providers at the primary/secondary care and at the health and social care interface; distinct organizational and professional cultures; and differences in terms of governance and accountability [1].

A substantial number of evaluations have been carried out of interventions designed to improve the integration or coordination of care. A systematic review based on 21 reviews and 85 primary studies [2] showed that many of these initiatives were effective in improving care, though many fewer resulted in a reduction

in healthcare costs (Table 1). One of the conclusions of this and other reviews is that the effectiveness of attempts to provide better integrated care is highly dependent on the context in which the intervention takes place. Interventions cannot be seen separated from the context in which they are introduced, and this has been an important guiding principle in the evaluation described in this paper.

In response to concerns that the needs of the aging population for well-integrated care were increasing, the UK Department of Health for England announced in 2008 that a number of 'Integrated Care Pilots' would be established. Healthcare purchasers and providers were invited to submit proposals for innovative approaches to providing better integrated care [3]. There was no specification as to the form that such integration should take, or client groups who should receive the intervention. There were over 100 applications, and after a two-stage selection process, the Department of Health selected 16 pilots. The localities of selected pilots and the main focus of each are described in Annex 1.

**Table 1.** Summary of the evidence on the effectiveness of interventions to improve coordination in health care, from Powell Davies et al. [2]

Main focus of intervention	Proportion (%) of studies with positive outcome for health	Proportion (%) of studies with positive outcome for health/ social care service user satisfaction	Proportion (%) of studies with positive outcome for cost saving
<i>Changed relationships between service providers</i> Structured relationships between service providers including co-location, case management, multi-disciplinary teams or assigning health/social care service users to a particular PHC provider (33 studies)	19/29 (65.5%)	8/12 (66.7%)	2/12 (16.7%)
<i>Coordination of clinical activities</i> Using structured arrangements for coordinating service provision between providers, including joint consultations, shared assessments and priority access to another clinical service (37 studies)	19/31 (61.3%)	4/12 (33.3%)	3/15 (20%)
<i>Improving communication between service providers</i> Interventions designed to improve communication between service providers, e.g. case conferences (56 studies)	26/47 (55.3%)	12/22 (54.5%)	2/21 (14.3%)
<i>Support for clinicians</i> Interventions include support or supervision for clinicians, training (joint or relating to collaboration), and reminder systems (33 studies)	16/28 (57.1%)	8/14 (57.1%)	1/12 (8.3%)
<i>Information systems to support co-ordination</i> Using information systems to support the coordination of care, including care plans; decision support, proformas; health/social care service user held or shared records; shared information or communication systems; and a register of health/social care service users (47 studies)	23/38 (60.5%)	7/19 (36.8%)	2/13 (15.4%)
<i>Support for health/social care service users</i> Interventions include education, reminders and assistance in accessing care (19 studies)	6/17 (35.3%)	3/6 (50.0%)	1/7 (14.3%)
All studies	36/65 (55.4%)	14/31 (45.2%)	5/28 (17.9%)

A team from RAND Europe, Ernst and Young LLP and the University of Cambridge were appointed to carry out a three-year evaluation that was augmented by the inclusion in the evaluation of experts from the Nuffield Trust. The evaluation aims to answer the following questions:

- What approaches to integration have been employed by the pilots?
- What approaches to integration work well and in what contexts?
- Who benefits from integration, in what ways, and with what consequences for equity?
- What resources are required to make integration succeed and how can these be efficiently used?
- In delivering integrated care in the English National Health Service, what policies and practices are: most likely to deliver the intended outcome, most capable of being implemented and most acceptable to patients, users, clinicians, managers and the wider public.

A mixed methods approach was adopted including interviews with staff and patients, non-participant observation of meetings, structured written feedback from sites, questionnaires to service users and staff, and analysis of routinely collected hospital utilisation data for patients/users who had been recruited into the pilots.

## Analytical framework

Our approach to understanding the context in which integration takes place is based on two classifications relating to structure and function. At the start of the evaluation these classifications were deliberately general to avoid focusing too early on very specific approaches to integrated care. We wanted to accommodate the fact that the pilots themselves were still refining their approaches.

### a) Structure

Integration can be seen as occurring at three levels [4, 5]

- *Micro-level integration activities.* These promote integration among individual practitioners within a single organisation (e.g. between doctors and nurses in a primary care practice setting).
- *Meso-level integration activities.* These promote integration among practitioners working in different organisations (e.g. between GPs and specialists). This might include co-location of services, which could occur with or without *macro-level activities*, such as pooled budgets.
- *Macro-level integration activities.* These promote integration designed to facilitate organisation-to-

organisation working, e.g. across different sectors. These may include policy agreements and financial arrangements. Examples of these are pooled budgets or joint budget holding between health and social care services, employment of care staff in a single organisation, or structural changes to facilitate work across two or more organisations.

### b) Function

Integration can be classified [6] in terms of

- *Organisational integration*, where organisations are brought together by mergers or by structural change.
- *Service integration*, where different clinical services or support/back-office functions are integrated.
- *Clinical integration*, where the focus is on care for a particular condition.

This classification will guide our analysis of the data, and our testing of the various hypotheses which arose during the course of the study. These included hypotheses that integrated care would lead to the development of new organisational structures to support integration, changes in staff roles, increased staff job satisfaction, fewer unscheduled emergency hospital admissions, reduced length of hospital stay, increased patient satisfaction, and reduced cost.

It should be noted that the evaluation was designed and funded prior to the appointment of the integrated care pilots, so these hypotheses were developed during the first six months of the evaluation as a result of detailed interaction with the sites. This unusual research design allowed for the evaluation to be tailored to the aims of the sites which were not known at the time the evaluation team was appointed.

## Research methods

### Principles guiding the evaluation

The evaluation described here adopts the approach of the 'embedded evaluator'. The evaluation activities form a distinct strand within the Integrated Care Pilot programme, helping to co-produce the successful delivery of the programme, rather than a completely separate study focused solely on contributing to the scientific understanding of integrated care. However, it is equally important that the evaluation contributes to scientific understanding and that it generates valid and independent evidence to support decision-making in the future. The approach combines systematically collecting and synthesizing evidence from across all the pilots together with a deeper investigation of a smaller number of pilots in order to gain more detailed

understanding of the structures, processes, costs and outcomes of integration.

Integrated Care Pilots use a variety of integrating activities (ranging from influencing, creating incentives, sharing information, creating new information systems and so forth) and have a variety of objectives (including improving the effectiveness and efficiency of services, enhancing patient reported outcomes and delivering measurable health improvements. In this context, the research approach is multi-method in order to understand both the activities pursued and the outcomes achieved. The evaluation is based on six approaches to data collection and analysis:

1. Systematic qualitative data collection from all sites (through a 'Living Document' which is a semi-structured document completed regularly by each pilot site).
2. In-depth case studies of six sites ('Deep Dives') including interviews with staff and patients/service users and non-participant observation of meetings [see Section Systematic qualitative data collection from all sites (the 'Living Document') for more on why we decided to use case studies].
3. Difference in differences analysis of data on hospital utilization comparing patients/service users enrolled in pilots with control data.
4. Data from patient questionnaires.
5. Data from staff questionnaires.
6. Analysis of costs (combining data from qualitative case studies and quantitative data on service utilization).

Evaluation involves a number of activities leading to an exercise of judgement [7, 8]. In evaluating the complex set of activities which broadly sit under the heading of 'Integrated Care Pilots' we also seek to arrive at judgements which are seen to be legitimate by the stakeholders involved [9]. This requirement for legitimacy is one of the many ways in which 'pure' research is distinct from evaluation. This legitimacy potentially involves five steps (similar to those identified by Scriven [10]):

1. Understand from those delivering the pilots and from those funding the initiative the criteria they consider to be applicable.
2. Agree the standards and intended outcomes that are applicable.
3. Gather data relating to these standards and outcomes.
4. Assess the contribution made by the agency/activity in achieving these standards and outcomes.
5. Form a performance audit judgement.

These steps protect the evaluators from the accusation of being arbitrary or otherwise non-rational, but an important part of the logic of the evaluation is to

develop a set of hypotheses based on the 'theory of change' offered up by the pilots themselves. Implicitly or explicitly, many evaluations of complex interventions use a 'theory of change' approach. These evaluations aim not only to understand the contribution made by a programme or activity to achieving outcomes, but also to interrogate evidence and communicate findings to support both learning and accountability. Our approach takes as its starting point the argument of Weiss [11, p. 66–67] that: "*The concept of grounding evaluation in theories of change takes for granted that social programmes are based on explicit or implicit theories about how and why the programme will work...The evaluation should surface those theories and lay them out in as fine detail as possible, identifying all the assumptions and sub-assumptions built into the programme. The evaluators then construct methods for data collection and analysis to track the unfolding assumptions. The aim is to examine the extent to which programme theories hold...the evaluation should show which of the assumptions underlying the programme are best supported by the evidence.*"

In this sense, 'theories of change' is a guiding approach rather than a methodology, and its successful delivery requires harnessing a range of methodologies, such as those outlined elsewhere in this paper. Our 'theories of change' approach has five precepts. First the approach requires us to not only look at the outcomes of the programme but to pay equal attention to processes. This contrasts with more classical evaluation approaches which tend to look at outcomes first and then to look for evidence to support attribution. Secondly, the approach requires a more 'embedded' evaluator where the evaluator works closely with policy makers, practitioners and end users to understand and elaborate a sometimes changing theory of change. Without losing their independence, successful evaluators will understand the world of the policy makers, practitioners and service users, including an understanding of what motivates their behaviour. Thirdly, the approach requires an ability to reconstruct and represent the sequence of events connecting actions to each other and how these contributed to the outcomes identified, reconstructing at least the sequence of events and statistical co-variations, but preferably also identifying the causal mechanisms at work. Fourthly, the approach is sensitive to the possibility that during the life of a programme or intervention, initial theories of change may alter in response to learning or to exogenous events and that the evaluation needs to capture these changing understandings and actions. Fifthly, it will also be sensitive to the fact that different and potentially conflicting theories of change might be simultaneously pursued within any one programme. Collectively, these precepts describe an interest not only in *causal*

effects (what happens when an independent variable changes) but also *causal mechanisms* (what connects causes to their effects); not only what officials say they do but what the evidence *shows* they do; and not only what contribution stories practitioners tell themselves and others but also what really *contributes* to benefit. Therefore, theory building and testing is an important part of the approach taken but it does not start with a *priori* theoretical claims or assumptions.

## Systematic qualitative data collection from all sites (the 'Living Document')

The Living Document involves semi-structured data collection from all Integrated Care Pilots at approximately six-monthly intervals during the evaluation. A lead person is designated in each site to collate responses in the Living Document, but in most cases, this individual draws on a variety of sources in collating responses, and there is an expectation that the views of a wide range of stakeholders will be represented in the completion of the document. The data collected in the Living Document are organised into a series of broad questions:

- Development of the pilot and background information. Questions identifying the background, purpose and background setting of the pilot.
- Who is doing what? Identifying the main people and organisations involved, and their roles in implementing the pilot.
- Processes—identifying the intended processes, and processes which have been implemented so far.
- Outputs and outcomes achieved so far.
- Progress to date. A description of progress to date, an assessment of progress against plan, and an outline of what has facilitated/prevented progress.
- Sustainability. Assessment of how arrangements to promote sustainability are progressing.
- Attribution of changes to specific initiatives relating to the pilot. An assessment of how much difference is really being made by the pilot itself, in the context of other health policy initiatives which are taking place concurrently.
- Resource implications of the pilot. Without attempting to provide a precise monetary value to the outcomes of the pilot, an assessment of the costs of the pilot, and whether benefits might have been achieved more easily in other ways.

After each round of data collection, data from the Living Document are analysed, and feedback is given in two ways. First, limited feedback is given to each site, including the opportunity to specify where more detailed information is needed in future rounds of

Living Document completion. Second, the overall themes emerging from the Living Document are analysed, and these are fed back in a single document to all sites after each round of data collection. This analysis also contributes to 'learning events' (conferences and teleconferences to address different issues of relevance to pilots) which are being run by the Department of Health throughout the pilot period, and subsequent rounds of the Living Document are adapted in light of feedback from the sites.

## In-depth case studies of six sites ('Deep Dives')

We selected a range of types of pilots for in-depth case study to reflect the range of approaches in the pilots and then select a sample from these reflecting the need for variety and site's ability to support a more detailed evaluation. For the depth case studies in six sites, we will structure the evaluation using an approach that combines logic modeling with process mapping of the patient journey. These methods will complement each other in creating a full picture of the integration pathways. Logic models [12] provide a brief summary of the key elements of an intervention (or programme, or project) and organize inputs, processes, outputs and outcomes systematically. They facilitate a focus on the causal links in the chain connecting the allocation of resources to the intended outcomes. As such, they are well suited to supporting an understanding the 'theory of change' underpinning the activity and simultaneously identifying the sorts of data that might support or weaken that theory [11].

This approach will provide both a way to describe and communicate the different interventions but also to provide a basis for what, causally, is happening. It will provide the framework for understanding how the inputs of a pilot are related to its outcomes and impacts. They are especially helpful in developing a shared understanding of a process between stakeholders and serve as a reference point for stakeholders in the initiative or programme. Process mapping the service user experience, by contrast, involves understanding the motivations, experiences and outcomes of the various interactions between the service user and the (integrated) service [13].

Using these case studies, we will address the following questions:

- What approaches to integration have been employed by the pilots? This will provide a richer description of models than is possible in the overall national evaluation by exploring experiences, motivations, relationships, processes and costs in more detail.

- What approaches to integration work well and in what contexts? This will generate data linking putative causes to observed effects i.e. understanding causal mechanisms.
- Who benefits from integration and in what ways (what definitions are there of 'success')? This will identify how benefits are distributed and with what implications for equality.
- What resources are required to make integration succeed and how can these be efficiently used? This will identify the descriptive categories of costs, establishing their dimensions, estimating overall costs, and suggesting how generalisable these findings might be. The Living Document will help identify what types of costs become apparent at various stages of development of a project.
- How the development of integrated care is facilitated or impeded by other current policies, e.g. payment by results, practice-based commissioning etc.

From these analyses, we aim to identify what policies and practices are most suitable (i.e. fit for purpose and likely to deliver the intended outcome); most feasible (i.e. capable of being implemented given the existing architecture of delivery and accountability); and most acceptable (i.e. likely to generate the support of the people who use services, clinicians and other professionals, managers and the wider public).

There will be three key data collection methods: semi-structured interviews with professionals and patients/service users, documentary analysis, non-participant observation of meetings. The qualitative data collection in the Deep Dive sites will also be used to collect data for the economic analysis (see below).

Interviews with staff will concentrate on the experience of delivering care, interactions with other professional groups and organizations within the Integrated Care Pilot, and understanding of implications for the wider care system. Interviews with patients and users will focus on the patient/user journey and experience and its relationship to changes in the Integrated Care Pilots.

## Service utilisation

In analysing data on service utilisation, we will focus principally on hospital admissions as a key variable, as many of the sites have a focus on reducing such admissions.

Data will be taken from Hospital Episode Statistics (HES), both for outpatient referrals, accident and emergency attendances and inpatient stays. These will enable analyses of changes in a number of measures of hospital use including overall rates of emergency admissions, admissions for 'ambulatory sensitive'

conditions (see [Annex 2](#)), and length of stay. We derived the list of ambulatory sensitive conditions from AHRQ [14] and Purdy et al. [15].

Information will be available for the individuals enrolled in any intervention, and also for the whole populations of general practices which are participating in the Integrated Care Pilot. The data will be at person level but anonymised so that the research team cannot identify sensitive personal information or individual identities. The NHS Information Centre for Health and Social Care will act a trusted third party to handle any confidential information and create the anonymised linked fields for use by the research team.

One of the key challenges in undertaking analyses of changes in hospital use for complex interventions is that individuals may be selected for an intervention because they have a high use of health services. The problem is that any subsequent fall in utilisation in this group may simply be due to regression to the mean—that is people reverting to a normal level of use irrespective of the intervention. One way round this is to use an approach that allows us to standardise for differences in the risk of future admissions.

First, we will assess the impact of the intervention on individuals enrolled in the Integrated Care Pilots. Information on the prior patterns of diagnoses and hospital utilisation will be used to stratify cases according to the risk of admission. The actual level of utilisation before and after the agreed starting point in each pilot will be compared. In this way we will be able to track levels of hospital use for cohorts of people for 2–3 years before they became part of the pilot. We will then test for subsequent change and compare results by risk strata.

In addition, we will undertake a more sophisticated analysis to create a matched 'control group' constructed by identifying individuals within national data. These control cases will be matched on a number of variables including risk of admission (or other hospital use); major diseases recorded; history of hospital use; and characteristics of the area of residence, such as levels of deprivation. Matching will be conducted using propensity scoring techniques [16] and prognostic scoring techniques [17]. Trends in hospital use within the groups of selected control cases will then be used as a test of observed differences in those enrolled in the Integrated Care Pilots.

Second, we will quantify the effect of the interventions on wider groups of patients (e.g. practice populations) by matching utilization data to that from similar practice populations in national HES datasets. The population level analysis will assess whether the intervention might not only have an impact on individual patients but also upon the wider population.

Both of these approaches to analysis are required as there might be an impact of the interventions on individuals (e.g. a reduction in admissions) which could not be demonstrated in the wider population. This might be because resources were simply redistributed between groups at equal risk of admission, or because the numbers enrolled in the pilots were too small to show an effect on the wider population.

Sample size calculations suggest that few of the Integrated Care Pilot sites will enroll sufficient numbers for data from individual sites to be analysed. We therefore intend to pool data from sites which have similar aims and are providing broadly comparable interventions. It is not possible to say which sites will provide data that can be pooled, as all sites are still developing their interventions. However, it looks likely, for example, that several sites will be using a form of case management of high-risk patients with the aim of reducing hospital admission, and we will be able to pool data from such sites. Data will also be analysed on primary and social care utilisation (from patient questionnaires). However, these data are being collected primarily for the economic analysis, as none of the sites has reduction in primary care utilisation as their main goal.

Our analysis strategy is built around a generalized difference-of-differences regression approach at the person level. Regression models appropriate for each of the outcome measures (e.g. emergency admissions) will be developed. These may be Poisson models, negative binomial models, or gamma models as required by the form of the measure. Each individual will contribute one or more time periods to the dataset in both the pre- and post-intervention periods. Non-intervention controls will come from routinely collected national data. These models will use covariates including basic demographics and historical utilization to control for potential differences between the intervention and control cases. Person level random effects will also be included in the models to adjust standard errors for the repeated measures within person.

In addition to the traditional covariate adjustment in the difference-of-differences model we will use propensity score based methods. In a combined dataset of intervention cases and non-intervention controls a propensity score model will be fitted that uses available covariates to predict intervention vs. control status. The predicted treatment status probabilities can be used to match intervention and control cases. We may also use the propensity scores to produce analysis weights which can be combined with covariate adjustment to support 'doubly robust' estimation of intervention effects [18]. Doubly robust estimation combined with difference-of-differences modeling will provide intervention effect estimates that control for

both observed differences between intervention and control groups as well controlling for unobserved but fixed person characteristics.

The aim of identifying risk-matched controls and using propensity score analysis is to allow so far as possible for unmeasured patient and system effects and therefore to increase our ability to draw conclusions about likely cause and effect from what inevitably remains observational data.

## **Questionnaires for service users**

We are conducting two surveys to assess the experience of service users in 11 of the 16 pilots. The survey is being administered in autumn/winter 2009 and will be repeated on the same sample of service users in autumn 2010. The questionnaire was developed using the intended outcomes identified by pilot sites in their applications to join the scheme. This identified a number of domains which were common to most pilots and were therefore included in the questionnaire. These were:

- Communication with primary care doctors and nurses.
- Organisation and coordination of care.
- Care planning.
- Assessment of care from social services.
- Arrangements following discharge from hospital.
- Frequency of certain critical events (notes unavailable, test duplicated, wrong medication or wrong dose of medication prescribed, no follow-up arrangements after hospital discharge).

In addition, a question on service usage was included to contribute to the analysis of health service costs (see below). The questionnaire is available from the authors.

In selecting items to represent these domains, we drew questions where possible from existing validated instruments. In particular we drew a substantial number of questions from the English National GP patient survey which is currently sent annually to 5.5 million randomly sampled patients ([www.gp-patient.co.uk](http://www.gp-patient.co.uk)). By matching the socio-demographic and health questions to this survey also, we will be able to conduct a difference in differences analysis with individual control patients drawn from responders to the national survey.

For five pilot sites it was not appropriate to collect patient information using this questionnaire because of the nature of the intervention and/or the population group targeted by the intervention (for example, some pilots were focusing on end of life care). These sites are excluded from this part of the evaluation.

Questionnaires are being sent to up to 500 service users in each site. Where the site has identified more than 500 service users by autumn 2009, a random sample of 500 will be taken. Where fewer than 500 service users have been identified by March 2010, the questionnaire is sent to them all. Where a site is enrolling patients/service users sequentially during autumn 2009/spring 2010, all patients receive a questionnaire until 500 have been enrolled. Those individuals who receive a questionnaire in autumn 2009/spring 2010 will receive a second questionnaire in autumn 2010. For all service users, the site identifies the start data of any intervention, so that we can determine whether questionnaires returned have been completed before or after the start of the intervention.

### **Questionnaires for health and social care staff**

We are conducting two cross-sectional staff surveys within the 16 pilot sites, involving health and social care staff (including community nurses, GPs and social workers), in spring 2010, and repeated in spring 2011. The staff questionnaire has substantial sections for free text to allow staff to describe their experience of the pilot in more detail, and these sections will be transcribed for qualitative analysis. The questionnaire includes sections on:

- Job changes since the introduction of the Integrated Care Pilot.
- Perceived changes to the care that patients/service users receive.
- Changes in communication within and between employing organisations.
- Changes in team working.
- Communication with other health and social care staff.
- Job satisfaction, ability to deliver high quality care.

For the staff survey the targeted sample size is 50 staff from each site. The first are staffs who are closely involved in the development of the pilot (e.g. employed by the pilot). There are expected to be between 5 and 15 of these per site. The additional 35–45 will be sent to stratified random samples of practitioners whose work might be altered by the pilot—e.g. GPs, community nurses, social workers.

### **Economic analysis**

There are two approaches to the economic evaluation. The first is to estimate costs in order to provide decision-makers in the health and social care systems with a basis for understanding the categories and potential range of costs associated with the Integrated

Care Pilots. This will provide a sense of how much the approach might cost if it were implemented elsewhere. An important part of this will be through data collection in the Deep Dive sites where we will use the logic model, process maps, key informant interviews, and documentary evidence to produce estimates of the costs of providing integrated care. This will enable us to identify the categories of cost and the scale of resources required to deliver different models of integration. We aim to produce a clear understanding of the main categories of cost (staff by grade, equipment, building, travel etc.), the likely range of costs within each category, and subsequently estimate best, worst and most likely case scenarios.

We will also distinguish between ‘set-up’ costs and ‘running costs’, although in a fluid, adaptive and improving system it may be difficult to draw this distinction. For both of these we need to distinguish between the costs associated with participating in the DH programme (including, for example, participation in events, reporting, contributing to the national evaluation) and the costs solely required to deliver the integrated care programme. We also aim to gather data through time that can show how costs have altered in response to actual service delivery or in order to overcome changing circumstances etc. We propose only to look at costs internal to the health and social care system (including private sector partners) but we will be aware that costs could potentially be externalised onto service users and carers and we will ask service users and staff to comment on their sense of the types and magnitudes of these costs.

Across the Integrated Care Pilots where we are collecting quantitative data on hospital utilisation, data on hospital admissions and length of stay will be costed using standard NHS costs, and included in the controlled difference in differences analysis described in above.

### **Conclusion**

Selecting evaluation frameworks always involves a degree of compromise to meet conflicting demands within a finite budget. We have opted to balance the collection of data from across all the pilots with more detailed data from six Deep Dive sites. We have also opted to focus the evaluation on what the pilots themselves told us they were seeking to achieve. The benefit of this is that we will be in a position to provide an evaluation which is grounded firmly in what the pilots are seeking to do. This increases the chances that findings will be acceptable and used. However, it also means that some theoretical propositions will be under-explored and that attention may be directed



more towards intended outcomes than unintended outcomes. However, we are satisfied that this risk is managed by independent data collection (for example on service utilisation, service user surveys and staff surveys) and by the iterative way of working with those responsible for running each project.

In planning to assess the evidence produced by this evaluation, we have been influenced by the principles of realistic evaluation [19] in which the mechanism (the intervention) acts in context to produce the outcome. If there is a single lesson from previous evaluations of attempts to integrate or coordinate care, it is that the context in which an intervention is introduced is crucially important to its success or failure. So, in this evaluation, we have committed substantial resources to the qualitative evaluation, knowing that these analyses will be critical to interpreting the results of quantitative analyses. Our approach is to understand not only the 'dose, frequency and effect' but to identify the way pilots learn, respond and evolve and to take into account the expectations and motivations of staff and patients to understand how complex and evolving projects might have lessons for others seeking to do related things in different contexts. Policy makers, professionals, managers, carers and patients are all part of an emergent process. We do not expect to measure precisely all effects but we do expect to understand the likely scope of benefits and the scale of efforts required, to contribute to the analysis of health service interventions and so reduce decision-makers' uncertainties about integrated care.

This evaluation will produce a portfolio of evidence including interviews, surveys, cost estimations and service utilisation data aimed at strengthening the

evidence base for integrated care, and in particular identifying the context in which interventions are likely to be effective. These data will support a series of evaluation judgements but it is important to recognise that they cannot be arrived at by simple aggregation of data [20]. Rather, the process locates the new data within the existing body of research and forms judgements about what is added and how compelling this additional evidence is, thus reducing uncertainties about the role of integrated care in improving the efficient and effective delivery of healthcare.

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## Annex 1

### Summary of focus of individual Integrated Care Pilot sites

Pilot	Main focus (some sites have other objectives also)
Bournemouth and Poole Cambridge Church View Medical Practice Cumbria Durham Dales	Structured support for people with dementia in the community Support for end of life care in the community; reduction in unnecessary admissions to hospital Improved support for people with long-term conditions at risk of admission to hospital Improved support for people with long-term conditions at risk of admission to hospital Providing integrated primary and secondary care service for acutely ill people, improved community services, moving specialist services into the community, identification of people at risk of fuel poverty
Northamptonshire Integrated Care Partnership (NENE) Newquay Norfolk North Tyneside Northumbria North Cornwall Principia Partners in Health	Improved support for people with long-term conditions at risk of admission to hospital Structured support for people with dementia in the community Improved support for people with long-term conditions at risk of admission to hospital Screening of patients at risk of falls: assessment by multi-disciplinary team Improved support for people with COPD with a history of admissions to hospital Mental health care Improved support for people with long-term conditions at risk of admission to hospital. Second stream has specific focus on people with COPD
Tameside and Glossop	Structured programme of identification and management of people at risk of cardio-vascular disease (CVD). Second stream of work for people with established CVD
Torbay	Improved discharge planning. Support for GPs from community geriatrician. Improved support for people in the community with dementia, COPD and congestive cardiac failure. Falls prevention programme
Tower Hamlets Wakefield Integrated Substance Misuse Service	Structured care for people with diabetes Implementation of ‘dashboard’ routinely feeding back performance data for services providing care for people with substance misuse

## Annex 2

List of ‘ambulatory care sensitive conditions’ (ACSCs) and associated ICD-10 codes (derived from AHRQ [14] and Purdy et al. [15]). These are admissions for diagnoses that in principle may be preventable by good quality primary care

Ambulatory care sensitive condition	ICD-10 code	Definition
Alcohol-related disease	F10	Mental and behavioural disorders due to use of alcohol
Angina	I20	Angina pectoris
Angina	I240	Coronary thrombosis not resulting in myocardial infarction
Angina	I248	Other forms of acute ischemic heart disease
Angina	I249	Acute ischemic heart disease, unspecified
Angina	I25	Chronic ischemic heart disease
Angina	R072	Precordial pain
Asthma	J45	Asthma
Asthma	J46	Status asthmaticus
Atrial fibrillation and flutter	I471	Supra-ventricular tachycardia
Atrial fibrillation and flutter	I479	Paroxysmal tachycardia, unspecified
Atrial fibrillation and flutter	I495	Sick sinus syndrome
Atrial fibrillation and flutter	I498	Other specified cardiac arrhythmias
Atrial fibrillation and flutter	I499	Cardiac arrhythmia, unspecified
Atrial fibrillation and flutter	R000	Tachycardia, unspecified
Atrial fibrillation and flutter	R002	Palpitations
Atrial fibrillation and flutter	R008	Other and unspecified abnormalities of heart beat
Cellulitis	I891	Lymphangitis
Cellulitis	L010	Impetigo [any organism] [any site]
Cellulitis	L011	Impetiginization of other dermatoses
Cellulitis	L020	Cutaneous abscess, furuncle, and carbuncle of face
Cellulitis	L021	Cutaneous abscess, furuncle, and carbuncle of neck
Cellulitis	L022	Cutaneous abscess, furuncle, and carbuncle of trunk
Cellulitis	L023	Cutaneous abscess, furuncle, and carbuncle of buttock
Cellulitis	L024	Cutaneous abscess, furuncle, and carbuncle of limb
Cellulitis	L028	Cutaneous abscess, furuncle, and carbuncle of other sites
Cellulitis	L029	Cutaneous abscess, furuncle, and carbuncle, unspecified
Cellulitis	L03	Cellulitis
Cellulitis	L04	Acute lymphadenitis
Cellulitis	L080	Pyoderma
Cellulitis	L088	Other specified local infections of skin and subcutaneous tissue
Cellulitis	L089	Local infection of skin and subcutaneous tissue, unspecified
Cellulitis	L88	Pyoderma gangrenosum
Cellulitis	L980	Pyogenic granuloma
Congestive heart failure	I110	Hypertensive heart disease with (congestive) heart failure
Congestive heart failure	I130	Hypertensive heart and renal disease with (congestive) heart failure
Congestive heart failure	I132	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure
Congestive heart failure	I255	Ischemic cardiomyopathy
Congestive heart failure	I50	Heart failure
Congestive heart failure	J81	Pulmonary edema
Constipation	K590	Constipation
Convulsions and Epilepsy	G253	Myoclonus
Convulsions and Epilepsy	G40	Epilepsy
Convulsions and Epilepsy	G41	Status epilepticus
Convulsions and Epilepsy	R56	Convulsions, not elsewhere classified
COPD	J40	Bronchitis, not specified as acute or chronic
COPD	J41	Simple and mucopurulent chronic bronchitis
COPD	J42	Unspecified chronic bronchitis
COPD	J43	Emphysema
COPD	J44	Other chronic obstructive pulmonary disease
COPD	J47	Bronchiectasis
COPD	J20	Acute bronchitis
Dehydration and gastroenteritis	A020	Salmonella gastroenteritis
Dehydration and gastroenteritis	A04	Other bacterial intestinal infections
Dehydration and gastroenteritis	A059	Bacterial food-borne intoxication, unspecified
Dehydration and gastroenteritis	A072	Cryptosporidiosis
Dehydration and gastroenteritis	A080	Rotaviral enteritis

Annex 2 (Continued)

Ambulatory care sensitive condition	ICD-10 code	Definition
Dehydration and gastroenteritis	A081	Acute gastroenteropathy due to Norwalk agent
Dehydration and gastroenteritis	A082	Adenoviral enteritis
Dehydration and gastroenteritis	A083	Other viral enteritis
Dehydration and gastroenteritis	A084	Viral intestinal infection, unspecified
Dehydration and gastroenteritis	A085	Other specified intestinal infections
Dehydration and gastroenteritis	A09	Diarrhea and gastroenteritis of presumed infectious origin
Dehydration and gastroenteritis	E86	Volume depletion
Dehydration and gastroenteritis	K520	Gastroenteritis and colitis due to radiation
Dehydration and gastroenteritis	K521	Toxic gastroenteritis and colitis
Dehydration and gastroenteritis	K522	Allergic and dietetic gastroenteritis and colitis
Dehydration and gastroenteritis	K528	Other specified non-infective gastroenteritis and colitis
Dehydration and gastroenteritis	K529	Non-infective gastroenteritis and colitis, unspecified
Dementia	F00	Dementia in Alzheimer's disease
Dementia	F01	Vascular dementia
Dementia	F02	Dementia in other diseases classified elsewhere
Dementia	F03	Unclassified dementia
Dementia	R54	Senility
Dental conditions	A690	Necrotizing ulcerative stomatitis
Dental conditions	K02	Dental caries
Dental conditions	K03	Other diseases of hard tissues of teeth
Dental conditions	K04	Diseases of pulp and periapical tissues
Dental conditions	K05	Gingivitis and periodontal diseases
Dental conditions	K06	Other disorders of gingiva and edentulous alveolar ridge
Dental conditions	K08	Other disorders of teeth and supporting structures
Dental conditions	K098	Other cysts of oral region, not elsewhere classified
Dental conditions	K099	Cyst of oral region, unspecified
Dental conditions	K12	Stomatitis and related lesions
Dental conditions	K13	Other diseases of lip and oral mucosa
Diabetes complications	E100	Insulin-dependent diabetes mellitus with coma
Diabetes complications	E101	Insulin-dependent diabetes mellitus with ketoacidosis
Diabetes complications	E102	Insulin-dependent diabetes mellitus with renal complications
Diabetes complications	E103	Insulin-dependent diabetes mellitus with ophthalmic comps
Diabetes complications	E104	Insulin-dependent diabetes mellitus with neurological comps
Diabetes complications	E105	Insulin-dependent diabetes mellitus with periph circ comps
Diabetes complications	E106	Insulin-dependent diabetes mellitus with other spec comps
Diabetes complications	E107	Insulin-dependent diabetes mellitus with multiple comps
Diabetes complications	E108	Insulin-dependent diabetes mellitus with unspec comps
Diabetes complications	E110	Non-insulin-dependent diabetes mellitus with coma
Diabetes complications	E111	Non-insulin-dependent diabetes mellitus with ketoacidosis
Diabetes complications	E112	Non-insulin-dependent diabetes mellitus with renal comps
Diabetes complications	E113	Non-insulin-dependent diabetes mellitus with ophthalm comps
Diabetes complications	E114	Non-insulin-dependent diabetes mellitus with neuro comps
Diabetes complications	E115	Non-insulin-dependent diabetes mellitus with periph circ comp
Diabetes complications	E116	Non-insulin-dependent diabetes mellitus with other spec comp
Diabetes complications	E117	Non-insulin-dependent diabetes mellitus with multiple comps
Diabetes complications	E118	Non-insulin-dependent diabetes mellitus with unspec comps
Diabetes complications	E120	Malnutrition-related diabetes mellitus with coma
Diabetes complications	E121	Malnutrition-related diabetes mellitus with ketoacidosis
Diabetes complications	E122	Malnutrition-related diabetes mellitus with renal comps
Diabetes complications	E128	Malnutrition-related diabetes mellitus with unspec comps
Diabetes complications	E130	Other specified diabetes mellitus with coma
Diabetes complications	E131	Other specified diabetes mellitus with ketoacidosis
Diabetes complications	E132	Other specified diabetes mellitus with renal complications
Diabetes complications	E133	Other specified diabetes mellitus with ophthalmic comps
Diabetes complications	E134	Other specified diabetes mellitus with neurological comps
Diabetes complications	E135	Other specified diabetes mellitus with periph circ comps
Diabetes complications	E136	Other specified diabetes mellitus with other spec comps
Diabetes complications	E137	Other specified diabetes mellitus with multiple comps
Diabetes complications	E138	Other specified diabetes mellitus with unspecified comps
Diabetes complications	E140	Unspecified diabetes mellitus with coma
Diabetes complications	E141	Unspecified diabetes mellitus with ketoacidosis
Diabetes complications	E142	Unspecified diabetes mellitus with renal complications
Diabetes complications	E143	Unspecified diabetes mellitus with ophthalmic complications

Annex 2 (Continued)

Ambulatory care sensitive condition	ICD-10 code	Definition
Diabetes complications	E144	Unspecified diabetes mellitus with neurological comps
Diabetes complications	E145	Unspecified diabetes mellitus with periph circulatory comps
Diabetes complications	E146	Unspecified diabetes mellitus with other specified comps
Diabetes complications	E147	Unspecified diabetes mellitus with multiple complications
Diabetes complications	E148	Unspecified diabetes mellitus with unspecified complications
Dyspepsia and other stomach function disorders	K21	Gastroesophageal reflux disease
Dyspepsia and other stomach function disorders	K30	Dyspepsia
Ear, nose and throat infections	H66	Suppurative and unspecified otitis media
Ear, nose and throat infections	H67	Otitis media in diseases classified elsewhere
Ear, nose and throat infections	J02	Acute pharyngitis
Ear, nose and throat infections	J03	Acute tonsillitis
Ear, nose and throat infections	J040	Acute laryngitis
Ear, nose and throat infections	J06	Acute upper respiratory infections of multiple and unspecified sites
Ear, nose and throat infections	J312	Chronic pharyngitis
Fractured proximal femur	S720	Fracture of neck of femur
Fractured proximal femur	S721	Pertrochanteric fracture
Fractured proximal femur	S722	Subtrochanteric fracture
Gangrene	R02	Gangrene, not elsewhere classified
Hypertension	I10	Essential (primary) hypertension
Hypertension	I119	Hypertensive heart disease without (congestive) heart failure
Hypertension	I129	Hypertensive renal disease without renal failure
Hypertension	I139	Hypertensive heart and renal disease, unspecified
Hypokalaemia	E876	Hypokalemia
Influenza and pneumonia	A481	Legionnaires' disease
Influenza and pneumonia	A70	Chlamydia psittaci infection
Influenza and pneumonia	J10	Influenza due to identified influenza virus
Influenza and pneumonia	J11	Influenza, virus not identified
Influenza and pneumonia	J120	Adenoviral pneumonia
Influenza and pneumonia	J121	Respiratory syncytial virus pneumonia
Influenza and pneumonia	J122	Parainfluenza virus pneumonia
Influenza and pneumonia	J128	Other viral pneumonia
Influenza and pneumonia	J129	Viral pneumonia, unspecified
Influenza and pneumonia	J13	Pneumonia due to Streptococcus pneumoniae
Influenza and pneumonia	J14	Pneumonia due to Hemophilus influenzae
Influenza and pneumonia	J153	Pneumonia due to streptococcus, group B
Influenza and pneumonia	J154	Pneumonia due to other streptococci
Influenza and pneumonia	J157	Pneumonia due to Mycoplasma pneumoniae
Influenza and pneumonia	J159	Bacterial pneumonia, unspecified
Influenza and pneumonia	J160	Chlamydial pneumonia
Influenza and pneumonia	J168	Pneumonia due to other specified infectious organisms
Influenza and pneumonia	J18	Pneumonia, organism unspecified
Iron-deficiency anaemia	D460	Refractory anemia without sideroblasts, so stated
Iron-deficiency anaemia	D461	Refractory anemia with sideroblasts
Iron-deficiency anaemia	D463	Refractory anemia with excess of blasts with transformation
Iron-deficiency anaemia	D464	Refractory anemia, unspecified
Iron-deficiency anaemia	D501	Sideropenic dysphagia
Iron-deficiency anaemia	D508	Other iron deficiency anemias
Iron-deficiency anaemia	D509	Iron deficiency anemia, unspecified
Iron-deficiency anaemia	D510	Vitamin B12 deficiency anemia due to intrinsic factor deficiency
Iron-deficiency anaemia	D511	Vitamin B12 deficiency anemia due to selective vitamin B12 malabsorption with proteinuria
Iron-deficiency anaemia	D512	Transcobalamin II deficiency
Iron-deficiency anaemia	D513	Other dietary vitamin B12 deficiency anemia
Iron-deficiency anaemia	D518	Other vitamin B12 deficiency anemias
Iron-deficiency anaemia	D520	Dietary folate deficiency anemia
Iron-deficiency anaemia	D521	Drug-induced folate deficiency anemia
Iron-deficiency anaemia	D528	Other folate deficiency anemias
Iron-deficiency anaemia	D529	Folate deficiency anemia, unspecified
Iron-deficiency anaemia	D531	Other megaloblastic anemias, not elsewhere classified
Iron-deficiency anaemia	D571	Sickle-cell anemia without crisis
Iron-deficiency anaemia	D580	Hereditary spherocytosis
Iron-deficiency anaemia	D581	Hereditary elliptocytosis

Annex 2 (Continued)

Ambulatory care sensitive condition	ICD-10 code	Definition
Iron-deficiency anaemia	D590	Drug-induced autoimmune hemolytic anemia
Iron-deficiency anaemia	D591	Other autoimmune hemolytic anemias
Iron-deficiency anaemia	D592	Drug-induced non-autoimmune hemolytic anemia
Iron-deficiency anaemia	D599	Acquired hemolytic anemia, unspecified
Iron-deficiency anaemia	D601	Transient acquired pure red cell aplasia
Iron-deficiency anaemia	D608	Other acquired pure red cell aplasias
Iron-deficiency anaemia	D609	Acquired pure red cell aplasia, unspecified
Iron-deficiency anaemia	D610	Constitutional aplastic anemia
Iron-deficiency anaemia	D611	Drug-induced aplastic anemia
Iron-deficiency anaemia	D640	Hereditary sideroblastic anemia
Iron-deficiency anaemia	D641	Secondary sideroblastic anemia due to disease
Iron-deficiency anaemia	D642	Secondary sideroblastic anemia due to drugs and toxins
Iron-deficiency anaemia	D643	Other sideroblastic anemias
Iron-deficiency anaemia	D644	Congenital dyserythropoietic anemia
Iron-deficiency anaemia	D648	Other specified anemias
Migraine/acute headache	G43	Migraine
Migraine/acute headache	G440	Cluster headache syndrome
Migraine/acute headache	G441	Vascular headache, not elsewhere classified
Migraine/acute headache	G443	Chronic posttraumatic headache
Migraine/acute headache	G444	Drug-induced headache, not elsewhere classified
Migraine/acute headache	G448	Other specified headache syndromes
Migraine/acute headache	R51	Headache
Nutritional deficiency	E40	Kwashiorkor
Nutritional deficiency	E41	Nutritional marasmus
Nutritional deficiency	E42	Marasmic kwashiorkor
Nutritional deficiency	E43	Unspecified severe protein-energy malnutrition
Nutritional deficiency	E550	Rickets, active
Nutritional deficiency	E643	Sequelae of rickets
Other vaccine-preventable diseases	A35	Other tetanus
Other vaccine-preventable diseases	A36	Diphtheria
Other vaccine-preventable diseases	A37	Whooping cough
Other vaccine-preventable diseases	A80	Acute poliomyelitis
Other vaccine-preventable diseases	B05	Measles
Other vaccine-preventable diseases	B06	Rubella [German measles]
Other vaccine-preventable diseases	B161	Acute hepatitis B with delta-agent (coinfection) without hepatic coma
Other vaccine-preventable diseases	B169	Acute hepatitis B without delta-agent and without hepatic coma
Other vaccine-preventable diseases	B180	Chronic viral hepatitis B with delta-agent
Other vaccine-preventable diseases	B181	Chronic viral hepatitis B without delta-agent
Other vaccine-preventable diseases	B26	Mumps
Other vaccine-preventable diseases	G000	Hemophilus meningitis
Other vaccine-preventable diseases	M014	Rubella arthritis
Pelvic inflammatory disease	N70	Salpingitis and oophoritis
Pelvic inflammatory disease	N73	Other female pelvic inflammatory diseases
Pelvic inflammatory disease	N74	Female pelvic inflammatory disorders in diseases classified elsewhere
Perforated appendix	K350	Acute appendicitis with generalized peritonitis
Perforated appendix	K351	Acute appendicitis with peritoneal abscess
Perforated/bleeding ulcer	K20	Esophagitis
Perforated/bleeding ulcer	K210	Gastroesophageal reflux disease with esophagitis
Perforated/bleeding ulcer	K219	Gastroesophageal reflux disease without esophagitis
Perforated/bleeding ulcer	K221	Ulcer of esophagus
Perforated/bleeding ulcer	K226	Gastroesophageal laceration-hemorrhage syndrome
Perforated/bleeding ulcer	K250	Acute with hemorrhage
Perforated/bleeding ulcer	K251	Acute with perforation
Perforated/bleeding ulcer	K252	Acute with both hemorrhage and perforation
Perforated/bleeding ulcer	K254	Chronic or unspecified with hemorrhage
Perforated/bleeding ulcer	K255	Chronic or unspecified with perforation
Perforated/bleeding ulcer	K256	Chronic or unspecified with both hemorrhage and perforation
Perforated/bleeding ulcer	K260	Acute with hemorrhage
Perforated/bleeding ulcer	K261	Acute with perforation
Perforated/bleeding ulcer	K262	Acute with both hemorrhage and perforation
Perforated/bleeding ulcer	K264	Chronic or unspecified with hemorrhage
Perforated/bleeding ulcer	K265	Chronic or unspecified with perforation
Perforated/bleeding ulcer	K266	Chronic or unspecified with both hemorrhage and perforation
Perforated/bleeding ulcer	K270	Acute with hemorrhage

Ambulatory care sensitive condition	ICD-10 code	Definition
Perforated/bleeding ulcer	K271	Acute with perforation
Perforated/bleeding ulcer	K272	Acute with both hemorrhage and perforation
Perforated/bleeding ulcer	K274	Chronic or unspecified with hemorrhage
Perforated/bleeding ulcer	K275	Chronic or unspecified with perforation
Perforated/bleeding ulcer	K276	Chronic or unspecified with both hemorrhage and perforation
Perforated/bleeding ulcer	K280	Acute with hemorrhage
Perforated/bleeding ulcer	K281	Acute with perforation
Perforated/bleeding ulcer	K282	Acute with both hemorrhage and perforation
Perforated/bleeding ulcer	K284	Chronic or unspecified with hemorrhage
Perforated/bleeding ulcer	K285	Chronic or unspecified with perforation
Perforated/bleeding ulcer	K286	Chronic or unspecified with both hemorrhage and perforation
Perforated/bleeding ulcer	K920	Hematemesis
Perforated/bleeding ulcer	K921	Melena
Perforated/bleeding ulcer	K922	Gastrointestinal hemorrhage, unspecified
Peripheral vascular disease	I73	Other peripheral vascular diseases
Tuberculosis	A15	Respiratory tuberculosis, bacteriologically and histologically confirmed
Tuberculosis	A16	Respiratory tuberculosis, not confirmed bacteriologically or histologically
Tuberculosis	A17	Tuberculosis of nervous system
Tuberculosis	A18	Tuberculosis of other organs
Tuberculosis	A19	Miliary tuberculosis
Urinary infection	N10	Acute tubulo-interstitial nephritis
Urinary infection	N11	Chronic tubulo-interstitial nephritis
Urinary infection	N12	Tubulo-interstitial nephritis, not specified as acute or chronic
Urinary infection	N136	Pyonephrosis
Urinary infection	N151	Renal and perinephric abscess
Urinary infection	N159	Renal tubulo-interstitial disease, unspecified
Urinary infection	N30	Cystitis
Urinary infection	N390	Urinary tract infection, site not specified

The above table contains all conditions and codes listed in Purdy et al. (2009) tables 3 and 4 except the following:

- ‘Failure to thrive’ and ‘low birth weight’ are excluded as they are purely paediatric conditions.
- ‘Angina’ codes R073, R074, Z034, Z035 are generic chest pain codes which are unlikely to indicate ischaemic heart disease.
- E139 and E149 not included in ‘diabetes complications’ as both codes specify ‘...without complications’.
- Mental health admissions (with the exception of ‘dementia’) are excluded as they are not relevant to the evaluation sites that are collecting admission data. The excluded conditions are ‘deliberate self-harm’, ‘neuroses’ and ‘schizophrenia’. ‘Dementia’ is relevant to two pilot sites, and so is retained.
- ‘Stroke’ is excluded because of the substantial change seen in the admission criteria for stroke over the study period.
- O15 is excluded from ‘convulsions and epilepsy’ as the condition—eclampsia (a specific disorder of pregnancy)—is unrelated, except for the common symptom of fits.
- There are also some additional codes included:
- I129, I139, I132 and A082 are introduced by the process of converting the AHRQ codes from ICD-9CM to ICD-10.
- All cystitis codes (N30) are included in ‘urinary tract infection’, supplementing N300, N308 and N309.