Information and value based commissioning
Demand Management for Planned Care (SDO Reference 11/1022)

Aims

1.   There has been considerable growth of planned care episodes since 2005, which if it continued, is likely to become unaffordable and require the downward management of demand. The overall aim of this project is to develop metrics and information to support CCGs and GPs in understanding both the scale of required intervention, and how to moderate activity growth in ways that minimise the loss of patient health. We will actively diffuse these methods and metrics to CCGs together with accessible interpretations of the material, and will articulate their meaning as required. This overall aim is pursued within three inter-linked sections of work:

   (i)   To equip local commissioners with an indication of the scale of required intervention to moderate elective demand at CCG level in the next few years we will estimate the separate influences of System Reform and capacity growth in explaining the post 2002 increase in elective care at local level in both England and Scotland. We will further estimate the likely growth of planned care in English local areas following 2012, a period of little or negative capacity growth, but in which system reforms continue.

   (ii)   We will develop metrics and information to enable commissioners and GPs to manage the demand for planned care in a way that minimises any resulting sacrifice of patient heath. This information and these metrics will be outputs from studies which fall into two categories. The first group of studies will focus on comparisons across CCGs and will establish CCGs in which activity is high in comparison to CCGs with similar patient load; these studies will provide information on the effectiveness of policies which aim to reduce GP referrals rather than to act on hospital incentives to reduce activity. The second group of studies will focus on the costs associated with lower activity. These costs include both the health and NHS costs - fewer patient health gains, identifying patient characteristics with least gains from intervention, the costs of possibly higher emergency care- associated with reductions in planned care.

   (iii)   To actively distribute to CCGs and the NCB actionable information generated by the project pertaining to 1) patients use of, and health gain from, elective services, the comparative evidence for the system as a whole, together with 2) accessible explanations and interpretations of the material, and to work to share its meaning in discussion/focus groups.

Objectives

Objectives to understand the scale of required CCG moderation of planned care:
2.   To explain with a suitable model the increase in planned healthcare activity across CCGs in England, and Health Boards in Scotland post-2002, in order to better understand the scale of required moderation of planned care at CCG level in the next few years.

Objectives to inform PCTs whether local activity in leading planned care areas is high in comparison to CCGs with similar patient load, and the likely effectiveness of policies which aim to reduce GP referrals rather than to act on hospital incentives to reduce activity:
3.   To model planned activity at CCG level for several major elective conditions and provide each CCG with an indication of activity conditional upon local demographics, and measures of health care need.

4. To provide insight into how best to manage demand by better understanding the relative roles of GPs and Consultants in explaining the variability of activity, by decomposing CCG variation in treatment activity into (i) variation in patient referral rates, and (ii) variations in the rate of consultant treatment, given referral. To then explain the variation in both referral rates, and the rates of consultant treatment amongst those referred, across CCGs. The latter, for example, might be affected by the distance weighted number of beds and relevant consultants employed by 'local' providers, the local providers' waiting lists, the financial strength of the providers, ITC supply in the local market, etc. This conceptual advance will help commissioners understand, for example, whether local activity is driven by exceptional Consultant or GP decisions.

Objectives that are intended to help minimise costs of lower activity:
5. To support CCGs and GPs in their practice work, with actionable evidence by using PROMs and the linked condition specific-data to:

   (i) identify the characteristics of patients gaining most QALYs, and condition – specific gain, from a given procedure, and the variation across CCGs; to help explain why are some CCGs are better at referring patients who gain health by estimating patient health gains (QALY), by procedure, controlling for demographic group, provider, and CCG, in order to identify CCG and provider specific influences on outcomes; and modelling how far crude comparisons of CCG variation in health gain arises from local GPs/consultants selecting patients with characteristics (e.g. age, and PROMs pre-intervention scores) that are associated with being more (or less) likely to record a QALY gain, and patient choices regarding providers.

   (ii) examine whether CCGs that treat fewer patients for a procedure succeed in selecting those that most benefit from treatment; explore whether CCGs that generate most health benefits net of costs from a given procedure in planned care achieve this by undertaking high volume or by selecting high gain patients;

   (iii) examine the profiles of patients least likely to be treated in those CCGs treating fewer patients;

   (iv) examine how far procedures with high rates of growth are least damaging to moderate by exploring whether high rates of growth of activity, by procedure, are related to either low, or falling, pre-operative treatment thresholds, as provided by PROMs data, 2010-12;

   (v) map the relationship between treatment thresholds in terms of pre-operative condition and health gain, and thereby identify a set of pre-operable conditions that give a threshold to maximise health gain from a given resource constraint. This would provide a method for identifying the changes in thresholds that ensure the least sacrifice of health gain if budgets tighten.

6. To examine, using several methods, the consistency and applicability of PROMs evidence based presently on four treatments, more generally to planned care.

7. In all of the above, to be aware of the policy implications of variation in deprived areas, which experience under-treatment of elective care, disproportionately high treatment of ACSC elective care, and heightened use of emergency care. To explore policy influences that might reduce the share of ACSC elective treatment in all elective treatment, and to better understand whether low rates of GPs per needs

adjusted population, and high rates of single-handed GPs, give rise to lower rates of elective care and possibly more emergency treatment.

Background

8. This project comprises (i) a suite of studies using PROMs, HES and other data sources to inform and enable Commissioners and GPs to better assess how restraint might be administered in a way to minimise the loss of patient heath; and (ii) analysis of the recent increase in planned activity, to model and estimate how far CCGs might expect the growth of elective activity to continue, and to indicate the scale of intervention required to restrain demand to match available capacity.

9. Devlin and Appleby (2010) (p38) in a helpful survey observe the potential value of PROMs data by helping commissioners obtain 'value for money': what to commission, who to commission it from, and how best to commission. However, to date the use of PROMs data has been limited to extending analysis of the quality of providers' services, and to determining the benefits to various patient groups. For example, Street (2011) uses PROMs to innovatively estimate hospital productivity. The proposed work would extend the literature by adding studies of, for example, (a) why average health gain for a procedure may differ between Commissioners, by distinguishing the contribution of (i) the selection of patients by demographic group in a CCG, and (ii) the quality of care of the chosen providers; (b) whether reduced CCG activity is presently occurring in a way that is not based on pre-operative conditions or expected health gain; and (c) by exploring the profiles of patients who are not treated when CCG activity is low; and (d) by developing health evidence to support GPs work with patients as well as in their role as commissioners, e.g. Coulter and Collins (2011).

10. Whilst the use of a PROMs based instrument to make commissioning decisions would be a major departure from present arrangements towards referral there is evidence of support amongst GPs, commissioners, and patients for a more systematic approach, (e.g. Clarke et al (2009)).

11. While PROMs data, carefully investigated, can contribute to improving CCG decision taking, other more routinely collected data will also contribute. It would, for example, be helpful in interpreting differences in CCG practice referral rates for specific procedures, if it were known how activity for the CCG compares to others with similar demographic need. HES, ELSA, and small area data allow the construction of estimates of how far the volume of elective procedures being commissioned at consortium level is relatively high or low when contrasted with other consortia populations with similar need/demographic structures. (Propper et al (2005), Judge et al (2010).)

12. CCGs are likely to wish to move beyond health gain evidence and activity/ need ratios, to examine other indicators of how best to manage demand. One concern is that recent elective growth has reduced certain referral thresholds (Goldacre et al (2007). The larger is the relative supply component of the recent activity increase, the more likely that local thresholds have fallen which commissioners may regard as an indicator to reduce referrals. Commissioners are therefore likely to value evidence on changing referral thresholds, but this is not currently available on a systematic basis. Three years of PROMs data will be available later in 2012 so that some evidence of recent trends in thresholds will be available.

13. Various PCTs have developed planned treatment criteria expressed in terms of condition-specific instruments. However, the criteria, although cogent, are not aligned with the broader aim of maximising health gain within a given budget.

Findings from the proposed PROMs research on thresholds to indicate maximising health gain would enable these initiatives to be integrated with familiar NICE criteria.

14. Although other studies – for example, Judge et al (2010) – have provided evidence for the under-provision of elective services relative to need in deprived areas. Further work to ensure that pressures to moderate demand do not aggravate health inequalities, appears warranted. In contrast, elective activity in ACSCs is high relative to that in less deprived areas, so that work to strengthen understanding of how to build primary care to reduce this tranche of elective activity in deprived areas appears especially important. In deprived areas emergency care is relatively more prominent, and highlights both the paucity and usefulness of analysis of the link between activity in elective and emergency areas.

15. To be able to manage activity it is valuable to understand its determinants. Presently 'activity' is modelled as the consequence of various determinants of health need (demand) and capacity (supply) considerations, e.g. Gravelle et al. (2003). We propose separating this 'reduced form' explanation of activity into its component parts: this decision to refer, and the decision to treat given referral. We will examine these decisions by using both outpatient and inpatient data, and the GP (and hence, CCG) marker in HES. This conceptual advance will help commissioners understand various aspects of local activity including whether exceptional levels are driven by Consultant or referral decisions, and the organisational influences on both of these.

16. After five years of slight reduction in English elective care rates, there was an abrupt rise in elective care admissions between 2005 and 2010, which if continued into the next spending Review period could prove exceptionally difficult to financially accommodate within the constrained 'constant real' spending plans. Understanding the determinants of this exceptional rise in activity to 2010, and in particular the contribution of factors that may continue to drive growth post 2010, will help to provide a better understanding of the likely path of activity in planned care in the next five years. This understanding may well have an emphasis that varies between Clinical Commissioning Groups, given that geographic variations in capacity growth, waiting lists and demand growth have provided an uneven playing field for the recent national reforms. The account of elective care growth, and its likely near-term path will therefore be provided at a level useful for local commissioners. The primary aim of the first tranche of research is to explain the increase in planned healthcare activity across England post-2002, and thereby to provide a model suitable to also explaining the expected path of planned activity in the next few years. To achieve as great an insight into the separate influences upon planned care as the data allow, the relative roles of system 'capacity growth' on the one hand, and system 'change', and the development of 'choice', on the other are both explored, using evidence from both England and Scotland.

17. Empirical analysis of planned activity and demand/supply-side policy influences post-2002 has not yet been undertaken, but carries important implications: if capacity growth matters most, then the absence of capacity growth post 2011, reduces concern for unaffordable elective care growth. However, if the recent rise in activity is mostly due to rising demand (e.g. from liberating patient choice) this may continue to unfold and imply continuing activity growth. If supply-side factors are now endemic in the incentives of providers to encourage and facilitate more activity growth, they will persist, and require active interventions. However, in practice demand and supply factors interact in health care markets; Dranove (1988) presents one framework within which to understand this interaction by allowing for the decision regarding whether a patient receives treatment to depend on the interaction between physician and patient. This suggests that empirical

analysis introduce interactions between demand- and supply-side factors. Analysis of supplier inducement is given, for example by McGuire (2000) and Evans (1974). Elective care activity has been modelled for the pre-choice reform period – e.g. Sutton et. al. (2007) – and the proposed project would be the first to incorporate Scotland.

Need

18.   While useful databases are available to both model demand and, if required, to moderate it with least harm to health – e.g. HES; PROMs; referral numbers from Choose and Book by GP, practice, speciality, and hospital – raw data is of limited value both in strategic and patient–level decisions. The collection of datasets in the past decade has outstripped the provision of analysis to inform understanding.

19.   As an example, while CCGs are likely to be in possession of crude activity rates by procedure, these are hard to interpret as indicators of over/under activity or to provide a basis for decision–taking, without allowing for demographic and need variables at CCG level. We plan to meet this need by providing at the outset of the project comparative activity by major procedure benchmarked by local health need and demographic structure. This will also be undertaken to meet the need for benchmarked comparative average health gain for the four PROMs procedures.

20.   The CCGs will be key to the management of elective demand and shape practice approaches to referral. The shift to working within a consortium and having a hard budget will be a major development. Data on the variation in GP referrals are available for each local consortium and indeed DH has made internal estimates of the potential savings from levelling down high referral GPs towards mean levels. In this environment it will be important to develop approaches towards moderating referrals which avoid simple rules of thumb that might damage patient health. The reduction must be in those procedure-condition combinations which have lower value in terms of health gain relative to cost, with insights required into pre-operative thresholds, whether a CCG has high comparative activity rates or low mean patient Health Gain. The pattern of elective growth and the profile of variation across consortia can yield insights into opportunities for such appropriate reduction which can be reflected in the criteria for referral and treatment. Information on health gain can both inform commissioners reaching strategic decisions and help GPs act to moderate elective demand by sharing with patients the health gain evidence relevant to their elective condition.

21.   Some CCGs are already providing comparatively low activity and we shall be providing information on the type of patient that these areas are not treating. This may provide evidence leading to a more positive approach to treat some patients despite the overall concern to prevent activity continuing to rise.

22.   Some planned care activity could have been obviated and would have been better managed at an earlier point in the case history in Primary Care. There is clear evidence from HES that the rate of ACSC elective procedures is twice the level in deprived areas that it is in prosperous areas, and also a much higher share of elective care deprived areas. This class of elective care should be 'managed down' by strengthening Primary Care Management, and we shall address the need to identify those diseases and CCGs that could significantly reduce ACSC elective care.

23.   Key to the management of demand in the reformed NHS will be the Commissioning consortia who will both manage hard budgets and shape practice approaches to referral. The shift towards working within a consortia with hard budgets will be a major development for every local NHS particularly given the soft (or no) budgets

at GP level, as prevailed until recently. Data on the variation in GP referrals for each CCG are available, and indeed DH has made internal estimates of the potential savings that might arise from levelling down high referral GPs towards mean levels. However, control of referrals can be frustrated by providers if consultants adjust treatment rates conditional upon referral. It is important that CCGs are aware of the tendency of local providers to treat, relative to providers generally, so that such issues might be raised and negotiated with providers. Our work will meet this need.

24. The market for elective care has changed dramatically in the past seven years. Capacity has increased – both NHS and through ISTCs. Demand has also probably been increased since 2005 as a result of both falling waiting times, and the increased emphasis upon patient decision taking and choice, which may have diminished the emphasis upon gate keeping. The tariff has also separately influenced provision in some service areas, and in replacing a block grant model, has possibly contributed to rising activity levels. These changes may have resulted in falling referral threshold levels. We shall provide evidence on thresholds that will help commissioners determine whether well-targeted interventions are needed to moderate the growth of elective care. However, such downward management of elective referrals and activity must be done in a way that minimises the sacrifice of health gain. This diminution in health gain might arise directly from inappropriate methods to ameliorate referral levels for certain patient groups, or indirectly by diverting NHS work into additional emergency care that might substitute for certain elective care.

25. The costs to NHS management of attempting to 'manage demand' without having good estimates of expected activity without intervention, are likely to be large; both unnecessary restriction, and financial deficits, come with a high patient price. Higher demand, and increased capacity may both have contributed to the rise in activity, but the determinants of planned activity are not well understood. Given the sharp rise in clinical capacity just as reforms were being introduced, there is genuine uncertainty about the importance of each, and only careful analysis of the different experiences of different parts of England and Scotland is likely to separate their contributions. Since the relationships between activity and both capacity growth and the development of choice are not understood, the likely path of planned care growth post 2011 can presently only be informally estimated. Similarly, estimates of the variation in activity growth between CCGs post 2011 are not available.

26. The tightening financial environment combined with the new challenges introduced by the reform of PCTs into Consortia creates a premium on research that will help moderate elective admissions without unnecessary sacrifice of patient health. Such research will help to identify the strategic direction of change best suited to patients, and at a time when the increasingly scientific skills leading local commissioning will be able to benefit from such evidence.

27. Commissioning evidence, and the models to deepen understanding of CCG 'performance', patient need and selection for treatment, the influence of CCG level treatment restriction on patient health gain, and the role of consultants in treatment variability, are topics of enduring value to the NHS. These topics are raising in some cases new questions that can act as a stimulus to further important research topics.

Methods
A model of the growth in planned care post-2002

28. The purpose of this modelling is to uncover the causes of the sharp rise in elective care activity post-2005 following a period of little growth in the three preceding years, and to apply this understanding to informing the CCGs the likely path of demand growth post 2012.

29. It is often presumed that System Reform has increased the demand for elective care, partly by reducing the restraining effect of GP gatekeepers. Since these reforms remain in place, the expectation is heightened that elective demand will continue to grow. However, it is also the case that extra capacity was provided during this period, supported by a substantial funding increase, and if this extra supply was primarily responsible for 'inducing' the extra output, then the recent fiscal contraction is likely to moderate, or even halt, the growth in elective services. The study design is intended to identify the separate importance of these two effects and thereby enable advising CCGs of the likely local growth in demand post-2011. It achieves this objective by using both English and Scottish data which enables the separate contributions of System Reform and capacity to be estimated, since System Reform arises only in England. Evidence regarding capacity and demographic determinants of the demand for elective care is available for both English CCGs and Scottish Board areas. On the basis of this analysis we expect to be able to estimate the influence on elective demand of System Reform when accompanied with capacity contraction and give indications for individual CCGs of the likely strength of demand growth for elective care.

30. Our starting point for modelling the growth in planned care is to draw a distinction between supply-side and demand-side drivers. There have been substantial changes to the structures that channel demand and strengthen supply in the past decade and the modelling will aim to capture where possible aspects of those developments. We first consider demand.

31. Demand Policies that have aimed to empower patients (the Choice agenda) can be expected to interact with patterns of illness, to primarily affect the demand for health care. If these are the predominant sources of the growth in planned care they can be expected to develop in the future according to policy decisions in regard to extending patient choice, and according to the changing age and health status of the population. There may long-term consequences of having energised patients to be more pro-active in regard to their health care, such that even after the active phase of these policies demand continues to grow.

32. Supply Policies that have aimed to incentivise providers of health care, through Payment by Results, the adoption of targets and sanctions, and the promotion of competition and encouragement of new entry are directed at the supply-side of health care provision. Increased NHS funding to support both elective and emergency care has accompanied these policies and whilst this extra funding is now being withdrawn, if these supply-side factors are the predominant sources of the growth in planned activity, they too may persist beyond the active policy interventions; the behaviour of health care providers can be expected to evolve and adapt to the changing structure of the markets in which they operate. As has long been discussed in the context of health care, regulating excess willingness to supply is problematic and may require reconsideration of the nature and role of pricing mechanisms. The predominant literatures to consider here are those concerned with agency and supplier-inducement see, for example McGuire (2000) and Evans (1974). Determining both the likely extent of the problems and designing the appropriate responses to regulating the growth in planned activity

requires an understanding of the role and extent of both demand-side and supply-side contributions.

33. In practice, demand and supply factors interact in health care markets; Dranove (1988) presents one framework within which to understand this interaction by allowing for the decision regarding whether a patient receives treatment to depend on the interaction between physician and patient. This suggests that it may be important to consider possible interactions between and demand- and supply-side factors and we will account for this in our empirical implementation, as detailed below.

34. The fundamental challenge to resolving the source of activity growth is that both supply-side and demand-side factors have been changing in the NHS in England over the period that we will investigate. To identify the impact of a given factor we require both a treatment group (for whom the factor applied) and a control group (for whom it did not). As in all studies using routine, non-experimental data our study design seeks out natural variation in the adoption of a policy or change in market conditions. Where a factor affects all providers or PCTs at the same time it is not possible to identify its effect, since there is no control group. Where two factors occur at the same time, but across different PCTs we can only identify their combined effect. Our approach will be to exploit both the variation within England in the adoption and take-up of various supply-side and demand-side factors and variation between Scotland and England, where Scotland often acts as a natural control not having been subject to either Patient Choice or Payment by Results policies.

Data
35. Hospital Episode Statistics (HES), and its Scottish equivalent, the Scottish Morbidity Records (SMR), contain the records of all hospital admissions and as such are a rich source of data for this project.

36. We will exploit the large volume of data in HES and SMR to construct a data set that comprises, for the dependent variable, activity measures (number of procedures, or procedures per head of population, or procedures relative to non-elective activity) for each elective HRG, in each year, by either 1, each provider or 2, each CCG (equivalently in Scotland – Health Board) area. Furthermore, covariates will be constructed from HES and SMR such as, for example average cost, Length of Stay, HRG specific shifts (fixed effects) and policies affecting that procedure, or from other publicly accessible health care data sources to help with the identification of additional CCG-related factors that could further explain differences in planned care across time and space.

37. This panel of data will allow us to model the level of elective activity in a given HRG for individual providers across time, and to identify the impact of demand-side and supply-side factors on activity. For example, consider the impact of the demand-side factor patient choice. The Choice agenda came into effect in England in 2006, thus a simple first approximation to modelling the impact of this factor is to suppose that it affected all HRGs in England from 2006 onwards. The key element of our model would be a variable that takes a value 1 if the activity is subject to the policy and zero otherwise. Whilst every activity indicator in England is potentially affected by the adoption of the Choice Agenda from 2006, this policy was not adopted in Scotland and so for each observation relating to Scotland the relevant value of the Choice variable is zero. For this policy, activity in Scotland acts as the control to the policy treatment in England. There are other modelling strategies for identifying the impact of patient choice, notably we might consider the impact of patient choice as occurring differently across HRGs, or being a treatment whose dose varied across HRGs. These possibilities illustrate the twin approach of our

modelling strategy, using both within variation in England and variation between Scotland and England in order to estimate the impact of demand-side and supply-side factors on activity.

38. Regression models will be estimated by standard Fixed-Effects and Fixed-effects-dummy-variable regression methods (as described and implemented in, for example, STATA's AREG routines, McCaffrey et. al., 2010). Model development will be undertaken to consider refinements in terms of modelling specific HRGs, or developing alternative measures of activity. The potential for demand and supply-side factors to be interdependent is affecting activity will be allowed for by included interaction terms in the regression specifications and these are to be analysed where they are statistically significant.

39. It is possible to extend the model by considering alternative dependent variables. For example, a variable where we divide the number of elective episodes by the local population would allow us to model what might be termed the propensity for elective treatment. This propensity will be explained in terms of the characteristics of the population, the specifics of the HRG under investigation, the characteristics of the provider and the policies that affected the behaviour of either patients or providers at the time.

40. A similar process would enable the investigation of the likelihood or hazard of an elective episode, relative to a non-elective, i.e. it is the proportion of this type of procedure that are planned admissions. This likelihood will be explained in terms of the characteristics of the population, the specifics of the HRG under investigation and policies that affected the behaviour of either patients or providers. This formulation is useful perhaps because it alerts policy makers to the danger that reductions in planned care may result in increases in unplanned activity; an increase in the likelihood being measured here might be considered a good thing.

41. Whichever model is considered it will provide a powerful set of tools for both understanding the sources of increases in activity and quantitatively attributing any increase in activity to these sources. Thus, with assistance, a CCG will be able to interpret the model in their individual context; the model will provide a basis for a CCG to both account for past growth in activity (e.g. how much was driven by choice policy or capacity growth) and predict future activity growth, according its own estimates of the likely path of the other sources of activity growth that pertain to it. A further feature of the class of models that we will construct is that they will provide estimates of idiosyncratic CCG specific factors that have influenced growth. We will thus be able to inform a CCG as to whether it is 'high' or 'low' growth, holding other factors constant. We perceive this to be a valuable input into CCG internal management processes, provoking and assisting enquiries into why a particular CCG has a specific problem or is 'unusual' relative to its peers.

Learning from Patient Reported Outcome Measures (PROMs), HES and other data

42. This part of the project aims to provide metrics and information to enable commissioners and GPs to manage the demand for planned care in a more informed way that minimises any resulting sacrifice of patient heath. This information and these metrics are outputs from studies which fall broadly into two categories.

43. The first category of studies (A) concerns evidence to inform CCGs whether local activity in leading planned care procedures is high in comparison to other similar CCGs, and the likely effectiveness of policies which aim to reduce activity by reducing GP referrals rather than to act on hospital incentives to reduce activity.

The second group of studies (B) are intended to provide information to help inform strategies to minimise the health costs of lower activity. The planned outputs for CCGs from both categories are discussed below.

Category (A)
Understanding variation in elective activity

44. We will use HES data to explore variation in activity rates by CCG across a number of important planned care procedures. Controlling for need, we will be able to identify high and low activity CCGs and to decompose the contribution of high or low rates into the decisions of GPs and hospital consultants (or commissioners and providers). Based on this disaggregation, we will investigate the reasons behind variation in activity. We will also consider the importance of patient willingness to undergo a given procedure. We expect factors such as the number of relevant consultants employed by 'local' providers, their waiting lists, the financial strength of the providers, ITC supply in the local market, etc to be important in determining a consultant's propensity to treat a given patient.

Category (B)

45. Using PROMs and HES data, we seek to address two related questions in this sub-section. First, in order to support policymakers considering a reduction in elective volume, we study the resulting consequences for health loss. In particular, we study a cross-section of high and low activity CCGs to ask whether health loss falls proportionately with volume, or whether lower volume is accompanied by more selective choice of patients at, therefore, higher average health gain. Second, if activity is to be moderated, we investigate the extent to which we can identify patient characteristics, including pre-operative conditions, which are associated with high levels of health improvement resulting from the PROMs procedures.

46. PROMs used for elective surgical procedures have been extensively validated for use to assess outcomes in a wide range of settings. The measures were selected for use following independent evaluative research by a team at London School of Hygiene and Tropical Medicine, on the basis of measures that were strongest in published evidence for reliability, validity, responsiveness and acceptability. The same group then examined their performance in extensive pilots to confirm their usefulness in the context of the NHS (http://www.northgate-proms.co.uk/documents.html). The key response rate of patients in the national PROMs programme is the return of questionnaires after surgery to assess outcomes. Over very large numbers of patients, there is a very positive response rate of 80%[1].

47. Subsequently, the measures have been widely used across healthcare systems and a wide range of clinical, policy and service questions such as performance of public and private providers, outcomes of different surgical techniques and levels of surgical expertise. They are now mandated for use in the NHS because of their high level of relevance to patients, providers and commissioners.

Understanding the health costs associated with moderating elective activity

48. We first describe and explain the difference in health gain performance across CCGs, as measured by PROMs data, using both simple approaches and also by estimating patient gain models capable of estimating effects for procedure, provider, demography, and the PCT/CCG. CCGs may perform well/badly due to

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[1] See http://www.ic.nhs.uk/statistics-and-data-collections/hospital-care/patient-reported-outcome-measures-proms/finalised-patient-reported-outcome-measures-proms-in-england--april-2009-to-march-2010-pre-and-post-operative-data-experimental-statistics

both the demography of the area and also because the mean performance across all demographic groups is higher in a CCG area, which is captured by a fixed effect. This might reflect patient selection or provider quality.

49. We also examine the consistency of fixed effects for CCGs across the four PROMs procedures in terms of adjusted volume, average health gain, pre-op condition and so on. This can be extended to compare CCG fixed effects in benchmarked models of performance in clinical conditions adjacent to PROMs – for example, in HRGs such as non-PROMs orthopaedics -and check whether the inferences concerning CCG effects from PROMs orthopaedics are similar to non-PROMs orthopaedics.

50. In order to study how far a reduction in elective activity in a CCG-area is associated with an increase in average health gain (because commissioners become more selective in whom they treat), we exploit the considerable variation in activity between CCGs. We shall explore the impact of activity variation on patient health gain controlling for the demographic characteristics that influence patient reported gain. There is informal evidence that patient gain is on average as great in high activity areas as in those with little activity, suggesting that low activity areas are not successful in selecting the patients who gain most from PROMs procedures. This will be explored to examine the implications for the capacity to refer and treat patients most able to achieve health gain.

51. To support the effective management of elective care, we will examine those CCGs with unusually low/high average health gain. By considering CCGs with few treated patients, we can identify the characteristics of patients who are not treated when an area offers low activity, and estimate the health loss for these patient groups associated with low activity.

52. A CCG which obtains a combination of high average health gain with high volume, is clearly selecting suitable patients and it will be useful to examine these commissioners in order to infer pointers to good performance.

Towards minimising the costs associated with moderating elective activity

53. Good patient selection depends on finding those who can benefit most. If activity is to be reduced, the obvious first step is to consider withholding treatment from patients with little to gain from it. Using the individual-level PROMs and HES data, it may be possible to offer guidance as to those who should not be treated, under a range of budgetary constraints.

54. In this study, we will extend the patient-gain model to include pre-operative conditions to establish their relationship to health gain. We will use a flexible parametric form, with and without control for patient characteristics. In turn, this will permit the establishment of a relationship between pre-operative conditions and QALY patient gain to be estimated and QALY gain associated with different treatment thresholds. By comparing these gains against cost of the procedure it will be possible to determine the pre-operative conditions consistent with the value of QALY gain just equalling the cost. We will consider need in an epidemiological sense, making use of published literature (see, for example, Judge et al, 2010).

55. This framework will also allow us to establish variation in patient QALY gain between demographic groups, providers, and CCGs, conditional upon pre-operative conditions.

Outputs

56. Our analysis will provide CCGs with the following intelligence:

(i) Using HES data, we will identify those CCG-areas with relatively high and low levels of activity in a number of important elective procedures, given the characteristics of each local population. We will also disaggregate levels of activity into the rate of GP referral and the rate of treatment amongst those referred.

(ii) We will determine whether areas with low levels of activity in PROMs procedures are successful in targeting their resources at those patients who benefit most.

(iii) We will describe how the relationship between activity and health gain varies across PROMs procedures at the CCG level.

(iv) We will support GPs in their referral decisions by identifying the pre-operative characteristics of patients most/least likely to gain from the PROMs and other elective procedures.

(v) Throughout the research, we will specifically consider the equity implications of our results, with reference to performance in deprived areas.

(vi) Finally, we will support CCGs by developing methods for moderating elective activity growth in a way that minimises the loss of patient health.

Distribution

57. Reports of activities and outcomes will be sent to CCGs, outlining evidence for their own population and appropriately compared to other CCG populations, using forms of presentation such as funnel plots for comparative data. In order to maximise accessibility and possible impact, the group will encourage dialogue and opportunity for clarification of data provided as part of the proposed study.

Contribution to Collective Research Effort and Research Utilisation

58. One product of the proposed work will be the report to NIHR SDO. Alongside the main report, which will describe the research and its findings in detail, we will provide short summaries of the research; and appendices presenting e.g. data tools, raw data where appropriate, and an archive of the stakeholder update reports.

59. To ensure national and international dissemination of the learning from this proposed research, we will aim to publish our findings in high impact peer reviewed journals.

60. In tandem with development of peer reviewed publications, the project will present its finding to national and international scientific meetings and conferences.

61. As we propose a formative evaluation, we will disseminate our learning to CCGs and other stakeholders by presenting at regular events. These will be supplemented by electronic updates, to be distributed to all interested parties after one year, and subsequently every six months for the term of the project.

62. A readable version of these updates will be provided to ensure that all interested parties – GPs, other commissioners, patients and the public are suitably informed. In order to maximise the audience awareness of our work we propose to encourage dialogue, providing accessible accounts of the findings to CCGs outlining their own data and outcomes, and to be willing to discuss the meaning of the results. The

NHS Alliance have offered to provide a format for discussion of the findings to groups in different areas of the country, including their patient networks.

Plan of Investigation and Timetable

63. It is unlikely that NHS budgets will increase in real terms in the foreseeable future, so that the prospect of rising expenditure on planned care is a serious concern. After five years of little change, planned care episodes grew by over 20% in the period to 2010, following the introduction of 'Choice' and various other aspects of reform. It is therefore prudent to develop plans to manage down planned care in order to avoid 'deficits'. However, this growth of planned care may not continue: the period since 2005 has been marked by not only choice, but considerable clinical capacity growth, which itself may have prompted activity growth, and will not re-occur post 2011. If elective activity continues to rise, it will be important that CCGs manage down planned care in an informed way, supported by evidence of how this can be done without patient health loss.

64. This study will both estimate the likely future growth in planned care at CCG level, and also provide a suite of metrics and evidence drawn from PROMs, HES and other sources, to enable CCGs to manage planned care with least loss of patient health. We aim also to infuse the CCGs with feedback about data pertaining to their patients and use of elective services, the comparative evidence for the system as a whole, together with an accessible explanation and interpretation of the material, and a willingness to discuss its' meaning.

65. This project comprises (i) a suite of studies using PROMs, HES and other data sources to inform and enable Commissioners and GPs to determine how restraint might be administered in a way to minimise the loss of patient heath that follows from reduced budgets; and (ii) analysis of the recent increase in planned activity, to model and estimate how far CCGs might expect the growth of elective activity to continue, and to indicate the scale of intervention required to restrain demand to match available capacity.

The timetable for the project:

Year One:

(i)   Collect all relevant data and link HES/PROMs to CCGs via the GP marker. Provide to CCGs the mean health gain and activity data for PROMs conditions, and activity data for major elective procedures, conditioned upon health need and demographics. Meet with patients/commissioners to inform work/presentation and group feedback to CCGs.

(ii)   Produce first draft of work to separate the variability of activity at CCG level into that due to variations in referrals and that due to variable rates of treatment amongst those referred, and examine the implications for CCG control of treatment rates.

(iii) Formulate the model of planned care by CCG/Scottish Health Boards, collecting all data, and ensuring comparability. Begin testing the influence of 'capacity' and 'system reform' drivers and provide initial findings for comment by Expert Group.

Year Two:

(i)   Estimate CCG specific influences on activity and health gain, and also derive provider effects.

(ii)   Complete analysis of the model of CCG activity, separating the influence of referral rates and the propensity of consultants to treat those referred. Finalise estimates of the relative importance of GP referrals in explaining treatment variability. Begin analysis of why (a) GP referral rates vary across CCGs and (b) consultant treatment rates vary across weighted groups of local providers.

(iii)   Complete analysis of health gain, and which types of patients are not treated in areas with low activity.

(iv)   Develop models of pre-operative thresholds for PROMs conditions that maximise health gain. Provide evidence for PROMs conditions of local CCG treatment thresholds and their changes 2010/12.

(v)   Distribute to CCGs evidence on CCG specific effects and local provider effects on activity and health gain. Share models and findings with commissioner/patient groups working with NHS Alliance.

(vi)   Complete analysis estimating the likely path of activity growth 2012 onwards. Meet with patients/commissioners to inform work/presentation and group feedback to CCGs.

Year Three:

(i)   Analysis of how far PROMS evidence concerning health gain and activity variation can be generalised to other elective conditions.

(ii)   Complete analysis of why GP variation in referral rates and Consultant variability in treatment rates may be influenced by organisational factors, giving deeper understanding of variability and the local decisions regard to moderate activity.

(iii)   Draw together implications for deprived areas, including analysis of ACSC elective conditions.

66.   Provide to CCGs the relative local importance of high/low referrals and high/low Consultant propensity to treat. Discuss the usefulness of controlling referrals. Update the benchmarking evidence for latest year – as provided in Year One – redistribute to CCGs. Discuss the results and their interpretation at meetings with CCG representatives/NHS Alliance networks.

Ethics Approval

67.   The project uses existing datasets not requiring ethics permission.

Project Management

68.   The project management is based in Oxford, as are all applicants except Prof Chalkley. The Research Fellows will work to project directors – the co-applicants – under the overall leadership of Prof. McCormick. Prof Chalkley will be responsible for developing the English/Scottish model of planned care, which will be co-directed by Prof McCormick to ensure Oxford leadership for the Research Fellows. Other topics will be managed by the Oxford based co-applicants. Prof Chalkley will visit Oxford on a regular basis to maintain contact with the researchers.

Public Users/Public Involvement

69. We wish to benefit from patient and commissioner insight into which evidence from the project will be of greatest value and how this evidence should best be presented – funnel elements/histograms etc.

70. The NHS Alliance have offered at Chairman level (Michael Dixon) to provide interaction with CCG leaders, their Director of Patient Involvement, and their patient networks to inform this project. We shall work with an expert group and with the patient groups in this network.

71. Furthermore, regarding public involvement, Ray Fitzpatrick is Associate Director of the DH PRP Research Unit, Quality and Outcomes of Person centred Care (QORU). QORU has an active patient involvement group of lay members who advise on the unit's research. The group are familiar with and have discussed specifically the unit's research on PROMs. A member of this group will be recruited to become part of the research group for the current study.

Expertise and Justification of Support Required

72. Prof Barry McCormick, Director of Centre for Health Service Economics and Organisation (CHSEO) and until recently Chief Analyst at the Department of Health, is an expert in health economics and labour market economics. He will provide academic leadership.

73. Dr Jose M Valderas is a GP and Head of the Policy Research Group, Department of Primary Care, at Oxford. He will provide clinical knowledge in relation to referral decision making and will support methodological development, particularly in relation to determinants and interpretation of variation in PROMs. He has experience in the development, and use of PROMs, with a particular interest in their use in clinical practice. He is Associate Editor of the Journal Quality of Life Research and holds a NIHR Clinician Scientist Award to study the use of PROMs in primary care.

74. Michael Goldacre is a Professor of Public Health at the University of Oxford; and is an Epidemiologist/Health Services Researcher. He is Director of the Unit of Health-Care Epidemiology. He has also been an NHS Public Health Consultant, and was a founding co-director of the South East Public Health Observatory. He directs the Oxford Record Linkage study, and has many associated publications. He brings much experience of, and achievement in, epidemiological and health services research to the project.

75. Prof Ray Fitzpatrick is an expert in health services research with particular interest in PROMs, having lead the group that developed tested and validated measures now used in the national elective PROMs programme and now testing the role of PROMs for long term conditions in primary care as well as developing and testing a new generic patient reported measure for a wider range of procedures in acute trusts.

76. Dr Nicholas Hicks is Director of Public Health and a Senior Research Fellow at Oxford University. Until clustering, he was C.E. of the PCT. He has clinical experience both in practice and hospitals. He was a Harkness Fellow, a founder member of the DH Strategy Unit and lead author of the NSF for CHD. He has extensive current knowledge and experience of health care commissioning and NHS reform and has also published widely on quality of care topics.
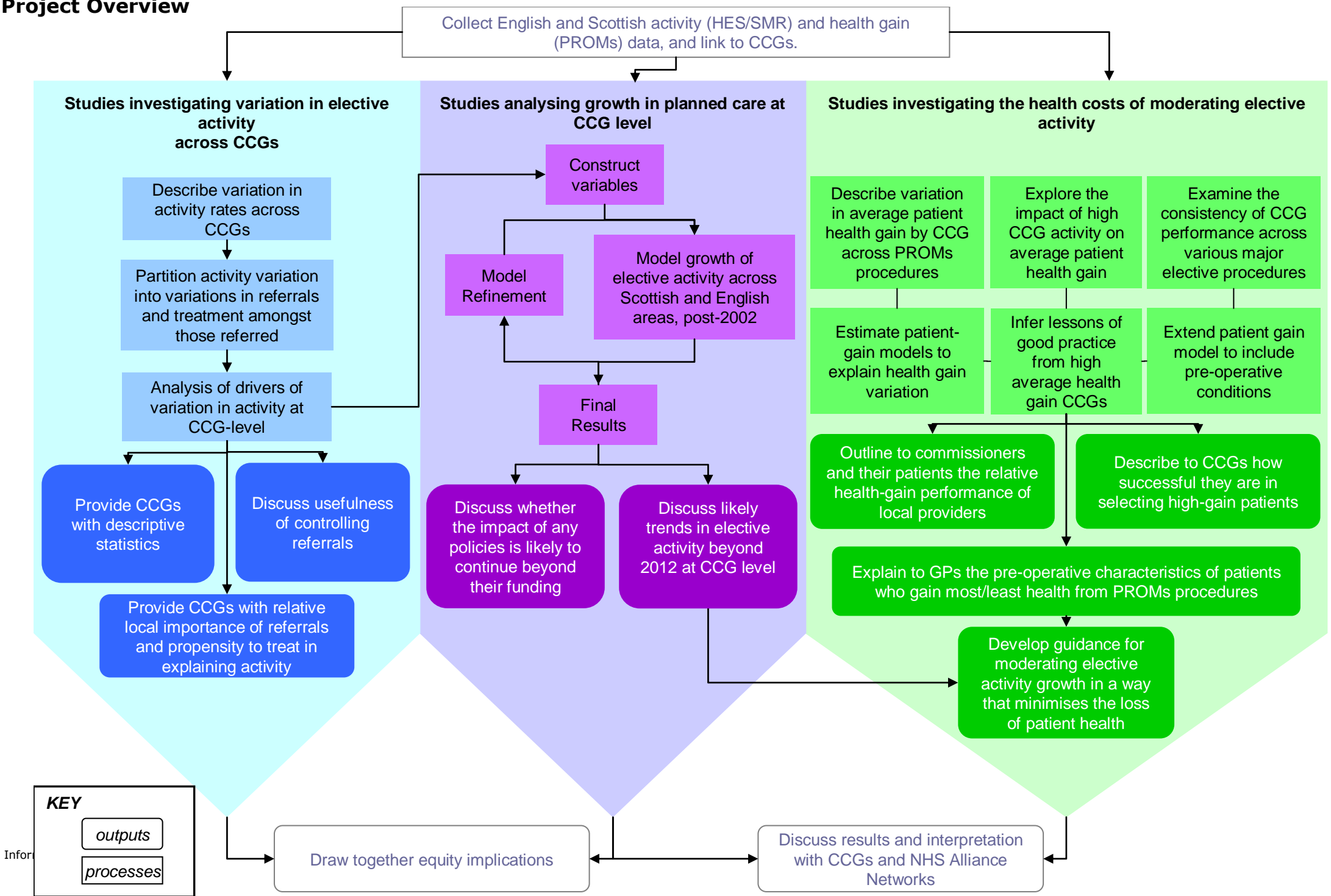
77. Martin Chalkley is a Professor of Health Economics at the Centre for Health Economics, University of York. Previously he was Professor at Dundee University for 13 years. He is an expert on the Scottish health system, and on the use of incentives in health systems. He works extensively on large data sets, including HES. He has been involved in several projects to evaluate the impact of the tariff, and has presented his work to NHS and policy audiences.

78. Dr Daniel Lasserson is a GP and Senior Clinical Researcher in the Department of Primary Care Health Sciences, University of Oxford. His research interests, spanning both primary and secondary care, are in service models and interventions to reduce cardiovascular risk, as well as primary care delivery to patients with complex co-morbidities. He was clinical lead for commissioning for the Oxford City consortium.

79. Professor Andrew Price is professor of orthopaedic surgery at Oxford University and fellow of Worcester College. He is the lead clinician in the Hip and Knee Unit at the Nuffield Orthopaedic Centre, and is working with the Oxfordshire CCG to develop a knee pathway in which PROMs are an integral part. He holds an HTA grant to support the use of PROMs in developing this pathway. He is also working with two national bodies – the British Knee Association and the British Association of Knee Surgeons – to develop a pathway for knee pain that also involves the use of PROMs.

Research questions

Each of the three coloured subsections of questions relates to one of the three workstreams described on the following diagram.

1. How does the rate of planned care activity vary across CCGs (after controlling for need)?
2. How far should local NHS commissioners seeking to reduce activity focus on altering the referrals of GPs rather than the willingness to treat of hospital consultants? What are the implications for individual CCGs?
3. To what extent should commissioners expect a reduction in elective activity to impact on demand for emergency care?

4. Did the volume of elective care in Scottish board areas grow in line with elective care across English PCTs following the introduction of System Reform in England? Is the conclusion changed for deprived areas? How far will CCGs experience continuing demand growth after capacity growth is halted in 2012?
5. How far did System Reform in England rather than the pattern of capacity growth, explain elective care growth in English CCGs and Scottish Health Boards after 2005?
6. Did the share of activity amongst high quality providers grow more in England, under System Reform, than in Scotland? Discuss and explain relevance to CCGs.

7. How far does health-gain from PROMs procedures vary across CCGs (after controlling for need and provider quality)? What explains this variation?
8. How successful are individual CCGs in selecting patients who benefit most from PROMs treatments?
9. How consistent is the effectiveness of CCG selection across PROMs and other procedures?
10. How far can we identify patient characteristics, including preoperative conditions, which are associated with high levels of health improvement resulting from PROMs procedures?
11. What methods should local NHS decision-takers adopt to reduce elective activity with least impact on patient health?

Project Overview

Collect English and Scottish activity (HES/SMR) and health gain (PROMs) data, and link to CCGs.

Studies investigating variation in elective activity across CCGs

- Describe variation in activity rates across CCGs
- Partition activity variation into variations in referrals and treatment amongst those referred
- Analysis of drivers of variation in activity at CCG-level
- Provide CCGs with descriptive statistics
- Discuss usefulness of controlling referrals
- Provide CCGs with relative local importance of referrals and propensity to treat in explaining activity

Studies analysing growth in planned care at CCG level

- Construct variables
- Model Refinement
- Model growth of elective activity across Scottish and English areas, post-2002
- Final Results
- Discuss whether the impact of any policies is likely to continue beyond their funding
- Discuss likely trends in elective activity beyond 2012 at CCG level

Studies investigating the health costs of moderating elective activity

- Describe variation in average patient health gain by CCG across PROMs procedures
- Explore the impact of high CCG activity on average patient health gain
- Examine the consistency of CCG performance across various major elective procedures
- Estimate patient-gain models to explain health gain variation
- Infer lessons of good practice from high average health gain CCGs
- Extend patient gain model to include pre-operative conditions
- Outline to commissioners and their patients the relative health-gain performance of local providers
- Describe to CCGs how successful they are in selecting high-gain patients
- Explain to GPs the pre-operative characteristics of patients who gain most/least health from PROMs procedures
- Develop guidance for moderating elective activity growth in a way that minimises the loss of patient health

KEY
- *outputs*
- *processes*

Infor

- Draw together equity implications
- Discuss results and interpretation with CCGs and NHS Alliance Networks

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