How capitation arrangements can be applied to deliver the NHS Sustainability and Transformation Plans (STPs)

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Traditionally, capitation arrangements are used as an alternative to fee-for-service reimbursement to facilitate a transfer of risk from the funder (usually a health insurance company or government funder) to providers of healthcare services (usually a group of doctors or a hospital facility).

The objective of introducing risk sharing between funders and providers is to encourage the delivery of efficient and patient-centred care by incentivising the integration of services and minimising unwarranted variation in care.

In this paper, we explore how the principles of a traditional capitation arrangement may apply in a regional National Health Service (NHS) system where the stakeholder roles differ and the implementation of various key capitation principles is not possible. This is particularly relevant in the context of the Sustainability and Transformation Plans (STPs)[1] that the NHS is currently developing with local councils. The STPs aim to encourage integration of services and collaboration between providers to improve the overall health system and alleviate the increasing cost pressures that the NHS and local councils are facing.

Traditional capitation considerations

A capitation arrangement is a form of risk-based contracting that involves a predetermined amount of money being transferred from a funder to healthcare providers for each enrolled patient over a fixed period of time. Through this arrangement, providers are incentivised to control utilisation levels and accept the risk of patients using more services than anticipated.

Risk-based contracting is an approach that can benefit a variety of populations and systems. For example, it can benefit systems where there is 1) current unmet need leading to poor quality and/or health outcomes, 2) significant unexplained pathway variation (typical in a fragmented care system), and finally 3) overutilisation of healthcare services.

The types of risk being transferred between funders and providers should be selected according to the types of risks each stakeholder is able to control. The objective is to align financial incentives with population health objectives rather than transferring maximum risk to healthcare providers. A successful risk-sharing agreement will be beneficial to all stakeholders and promote a sustainable health economy with improved clinical outcomes for patients.

Designing a capitation arrangement will typically include the following key considerations:

1. **Define the population to be included in the arrangement**
   The population could be the entire membership base or a subset of the population based on clinical and/or demographic characteristics.
2. **Define the services to be covered under the arrangement**
   For example, the arrangement could be focused solely on the utilisation of primary care services or could extend to all or a subset of outpatient and inpatient services. Certain services associated with excess volatility (e.g., low frequency and high cost services) could be carved out to avoid passing on inappropriate amounts of high risk to the risk-taking entity.
3. **Set a historical baseline of costs and utilisation and determine an expected trend rate**
   This component is essential for determining the capitation fee that will be paid to the risk-taking parties and how it is expected to change over time.
4. **Define a risk adjustment methodology**
   This will ensure that providers are adequately compensated for the varying risk profiles of their enrolled patients as well as how they may change over time.
5. **Define any risk share/gain share provisions and any quality measures to be included in these provisions**
   Ongoing monitoring of the contract's performance is necessary to assess if the contract is achieving the desired cost and quality objectives. This will enable the determination of how any resulting savings will be shared between stakeholders and if any adjustments are required, depending on whether quality objectives were attained or not.

1 An information statement on STPs from NHSE may be found at https://www.england.nhs.uk/stps/about-stps/.

Capitation in a regional NHS context

NHS England (NHSE) is responsible for managing its annual budget and for the planning and delivery of healthcare services in England. Approximately 68%[2] of this budget is currently allocated to 211 Clinical Commissioning Groups (CCGs). Each CCG is responsible for commissioning the majority of healthcare services for its patients with the exception of certain specialised services that are commissioned directly by NHSE. Social care and health improvement/promotion services are mostly commissioned by local authorities and Public Health England (PHE). Each CCG's responsibility includes planning and securing services based on need and monitoring the quality of care provided. An additional 12% of NHSE's budget is used to commission primary care services.

In an NHS context, the majority of STPs include population-based accountable care models such as Multispecialty Community Provider (MCP) frameworks[3] or Primary and Acute Care Systems[4] (PACS). These systems aim to improve the physical, mental and social health and well-being of local populations. Accountability is central to these new care models and their designs include providers being held to account on the basis of shared goals for population health.

A capitation or risk-sharing arrangement could be applied to a CCG or a group of CCGs and could cover services such as primary care, community and inpatient admissions or a subset of these. Depending on the scope of the agreement, the arrangement could be extended to include wider services such as social care services provided by local authorities. The risk-taking entity, or integrator, could be a private organisation or it could be formed through an MCP framework or PACS. Regardless of the type of entity that takes on the integrator role, the fundamental aspects of the arrangement discussed below will be broadly the same. The main differences will relate to how any risk/gain sharing will work and how savings may be shared between stakeholders.

Funding flows within the NHS

The level of funding that flows from NHSE to the CCGs depends on NHSE's annual budget. Each CCG area will receive a funding allocation for 1) core CCG allocations, 2) primary care services and 3) NHSE-specialised commissioning services. The combination of these three allocations forms the full funding allocation for each CCG area and these are usually known two to three years in advance.

The relative level of funding that each CCG area receives will be determined according to a funding allocation formula. The formula differs for core CCG

2 NHSE. Our 2016/17 Business Plan. Retrieved April 10, 2017, from https://www.england.nhs.uk/wp-content/uploads/2016/03/bus-plan-16.pdf.

3 Additional information on MCPs can be found in the document published by NHSE, "The MCP emerging care model and contract framework," available at https://www.england.nhs.uk/wp-content/uploads/2016/07/mcp-care-model-frmwrk.pdf.

4 Additional information on PACS can be found in the document published by NHSE, "Integrated PACS – describing the care model and the business model," available at https://www.england.nhs.uk/wp-content/uploads/2016/09/pacs-framework.pdf.

BLOCK CONTRACTS VERSUS CAPITATION ARRANGEMENTS

Although NHS block contracts and capitation arrangements both involve fixed cash flows from funders to healthcare service providers, the operation and transfer of risk under these arrangements differ.

- **Block contract**
  - Block contracts involve CCGs making regular (e.g., annual) payments to healthcare providers for services that are usually broadly defined. Payments are in advance of the services being provided and independent of the number of patients treated or activity undertaken. The value of the block contract could be calculated based on patient need or based on historical expenditure.
- **Capitation arrangement**
  - Capitation arrangements involve lump-sum payments being made to healthcare providers based on the number of patients included in the scope of the contract. Included services are usually predetermined within the contract. Healthcare providers absorb the risk of patients using more services than anticipated but typically do not absorb the risk of population growth, which is due to the payment being on a per capita basis.
  - If the capitation payments are risk adjusted, providers are protected from a worsening risk profile in the covered population.

Risks transferred to providers under block contracts and capitation arrangements

	RISK ABSORBED BY HEALTHCARE SERVICE PROVIDER		
RISK TYPE	BLOCK CONTRACT	CAPITATION ARRANGEMENT	RISK-ADJUSTED CAPITATION ARRANGEMENT
POPULATION SIZE	✔	✗	✗
RISK PROFILE	✔	✔	✗
UNIT COST	✔	✔	✔
UTILISATION	✔	✔	✔

FIGURE 1: ADJUSTMENT FACTORS USED IN NHSE FUNDING ALLOCATION FORMULAE

ADJUSTMENT FACTOR	CORE CCG FUNDING ALLOCATION FORMULA	PRIMARY CARE FUNDING ALLOCATION FORMULA
Population base	Based on general practitioner (GP) registrations and projected forward using Office for National Statistics (ONS) population projections.	Based on GP registrations and also includes patients in residential and nursing homes.
Age/sex mix	To adjust for differences in healthcare resource utilisation that are due to differences in population age/sex structures.	
Supply side variables	An adjustment made to reflect that greater availability of healthcare services usually leads to higher use. Because this is not a true reflection of need, the calculation does not penalise areas with lower utilisation due to lower capacity.	N/A
Unmet need and health inequalities (risk-profile adjustment over and above age/sex differences)	The adjustment is based on the standardised mortality ratio for those aged under 75 (SMR < 75). This is a measure of how many more/fewer deaths there are in a particular area compared with the national average.	Adjustment is based on: • SMR < 75 • Index of Multiple Deprivation (IMD)* • Number of newly registered patients because new patients generate a greater percentage of work in their first year.
Market forces factor (MFF)	Adjusts for how the cost of providing services differs by area, e.g., land and staff costs.	
Emergency ambulance cost	Adjustment for sparsely populated areas where ambulances may have to travel longer distances.	N/A
Cost of unavoidable smallness	Adjusts for the unavoidable higher cost of running small hospitals that are unable to achieve the same economies of scale as larger hospitals.	N/A

*The Index of Multiple Deprivation (IMD) is the official measure of relative deprivation for small areas (neighbourhoods) in England as defined by the "Lower-layer Super Output Areas" in the 2011 Census.

allocations,[5] primary care services[6] and NHSE-specialised commissioning services. Target funding allocations are calculated by risk adjusting baseline costs for the factors detailed in the table in Figure 1.[7]

The specialised commissioning funding allocation is largely based on an estimate of need from historical healthcare use with an MFF[8] adjustment.

Once the target allocations have been calculated, this is adjusted for the "Pace of Change Policy," which aims to move CCG areas closer to their target allocations over time.

Central to the design of the risk-sharing contract is the fact that funding allocations are fixed and any payment ceded to the integrator (the "integrator pass through amount") will be drawn from these allocations. Unlike a traditional capitation arrangement where premiums can be increased or additional funds can be allocated, if the calculated capitation fee exceeds the funds available to the CCG areas/integrator, no further funding will be available beyond the amount that has already been allocated.

The diagram in Figure 2 illustrates how the funding flows will vary between a regional NHS system with and without a risk-sharing arrangement.

Understanding the risks from the integrator's perspective

As with traditional risk-sharing arrangements, the risks transferred to the integrator should be based on what the integrator can reasonably be expected to control. There will be internal and external risks that are within and outside the integrator's control. As a first step, it is essential that these risks be identified and understood. Subsequently, the risk transfer element can be decided upon. A starting point for identifying risks is to consider 1) key events/changes that have happened in the past, 2) if there are any events that are likely to happen in the future and 3) the key drivers of utilisation and unit costs.

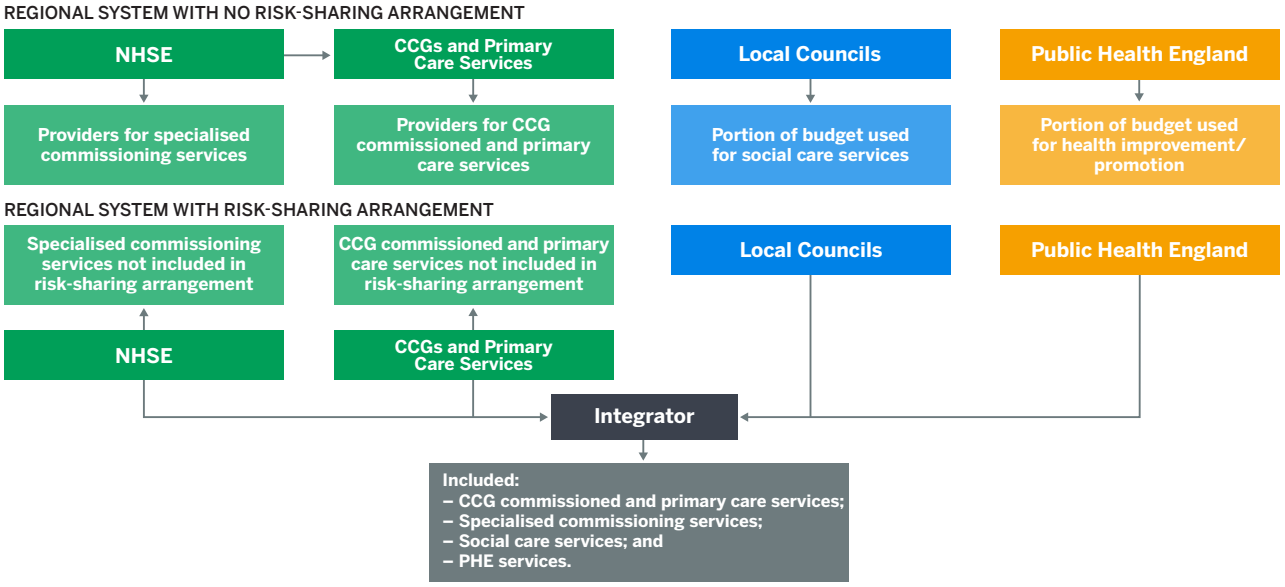
5 The core CCG allocations are calculated using separate formulae for 1) inpatient spells, outpatient attendances and accident and emergency (A&E) and critical care, 2) mental health, 3) maternity and 4) prescribing, with their results added together to arrive at the final target CCG funding allocation.

6 Primary care funding was historically calculated using the "Carr-Hill" formula, which is based on academic modelling of consultant workload and is largely based on need. Enhancements were made to this formula in the calculation of the 2016/17 to 2020/21 funding allocations.

7 NHSE (April 2016). Technical Guide to Allocation Formulae and Pace of Change, 2016-17 to 2020-21. Retrieved April 10, 2017, from https://www.england.nhs.uk/wp-content/uploads/2016/04/1-allctins-16-17-tech-guid-formulae.pdf.

8 The MFFs for specialised commissioning are slightly different from the core CCG allocations as specialised services are commissioned from a different mix of hospital trusts.

FIGURE 2: ILLUSTRATION OF REGIONAL NHS FUNDING FLOWS WITH AND WITHOUT RISK-SHARING ARRANGEMENTS



Internal risks relate directly to the risk-sharing arrangement. Internal risks may encompass trend risks such as average costs/utilisation being significantly different from expected or a change in the risk profile of the population. Volatility risk (or true insurance risk) is another example of an internal risk and it will generally reduce as the population size covered by the arrangement increases.

External risks, which are usually political or economic, could impinge on the integrator's ability to manage the budget, but will typically be beyond the integrator's control. For example, unexpected changes in tariff or large swings in drug costs would increase average costs, but these eventualities would be unrelated to the integrator's efforts to control costs within the system. A traditional capitation structure provides protection against population changes because the funding flows operate on a per capita basis. However, in a regional NHS context, a sudden surge in the population could also present an external risk to the integrator because adjustments to the funding allocation passed down from NHSE may lag behind changes in the population size.

Many of the identified risks will exist independently of whether the risk-sharing arrangement exists or not, but identifying these risks will help answer the following key questions:

- What risks can and cannot be transferred to the integrator?
- Who is affected by the identified risks, i.e., the CCG areas, the local authorities, the integrator or all stakeholders?
- What kind of events/risks will trigger a review of the risk-sharing contract and how often will the risk triggers be monitored?

Defining the population

The population to be covered will depend on the scope of the arrangement, the services included and whether the arrangement is intended to cover a whole population or a subset of the population with certain characteristics.

For example, if the arrangement covers primary care services and/or core CCG services, defining the population based on GP-registered lives within the relevant CCG areas is a sensible approach. Although this methodology appears simple, the ability to count the population in this way will depend on the availability and accuracy of the relevant information. Regularly maintained GP registries will be needed to avoid list inflation[9] overstating the covered population and to avoid excluding newly registered lives.[10] It should also be noted that using this approach will result in non-registered lives (which may subsequently register or use healthcare services while not registered) being excluded in the population count. Provision will need to be made for these lives by either setting aside a pool of funding so these patients are paid for on a fee-for-services basis or adding a margin to the calculated population count. The difficulty with both of these options is the uncertainty regarding the volume and likely utilisation of unregistered lives.

An alternative would be a prospective payment which is based on population estimates with a retrospective rebalancing at predetermined intervals. Although this would remove some of the uncertainty about the unregistered lives, there is less certainty about payment flows. In addition, a capitation fee will only be triggered for unregistered members who access services during the contract term but not for those who do not access any services.

9 List inflation occurs when deceased patients or patients who have moved out of the CCG catchment area are not removed from the GP register.

10 This is particularly important because patients often incur high utilisation and costs in their first year of registration.

If the arrangement is to include a subset of the population, a clear definition and the ability to identify these patients will be required. For example, the subset could be defined by age bracket or clinical condition and grouping patients that will benefit from having their services coordinated according to the contract. There will likely be an additional administrative burden if the contract only applies to a segment of the population because patient identification and provision of services will need to be operated concurrently with the rest of the system.

If the arrangement extends to social care services, defining the population may involve additional complexity because regional boundaries between CCG areas and local authority areas do not always overlap precisely. Consequently, if the arrangement is designed to cover certain CCG areas, a portion of the relevant local authority area(s) may fall outside the CCG area boundaries. Potential options for managing these boundary differences include:

1. Define the population according to the CCG area boundaries and apply this definition to social care services, too. The drawback of this option is that patients within the same local authority area will end up having their social care services managed differently. Further, local authorities will have the administrative burden of managing two concurrent systems, and it may also happen that multiple local authorities are required to operate within one CCG area.
2. The social care portion of the arrangement could be triggered as a patient becomes eligible for these services. In this instance, the basis of the social care arrangement is more similar to a "pathway fee" rather than a capitation arrangement because the uncertainty around utilisation is removed and only the expected cost of services once a patient begins claiming is considered. In this option, assumptions would need to be made regarding the likely cost, duration and mix of social care services that will be accessed.

If counting and defining the population using GP registries is not possible, alternative sources of population counts (such as census data or council tax records) could be considered. However, most alternatives will have drawbacks such as frequency of data collection, accuracy and whether or not the whole population is included. For example, census data is only collected every 10 years while council tax records will not necessarily include details for all members in a particular household.

Once the population definition and counting methodology have been finalised, consideration should also be given to the frequency of counting. Counting the population could occur at a point in time or lives could be averaged over a given period and this could be at monthly, quarterly or annual intervals. It is important to understand how different the population counts would be under each scenario to achieve an appropriate balance between credibility and effort.

Defining the services and setting a baseline cost

When defining the services and setting the baseline costs for the risk-sharing arrangement, the objective of the contract should help guide which services will be in the contract's scope. For example, the contract may have a primary care and community service focus or it may extend to inpatient utilisation as well.

In-scope services should be selected from a patient-centric rather than a service-centric perspective. That is, services should be selected by considering patient needs and providing cost-effective quality care rather than simply allocating a budget for services that are already covered in the system.

Accurate and complete cost and utilisation data should be available for all included services as this will be required to calculate the baseline costs and monitor the contract once it has been implemented. If granular data is not available, summary data may be used, but the accuracy and relevance of this data will need to be assessed. For example, if service-level cost information is not available, unit costs may be applied to utilisation data. Services should be defined in accordance with available data. For example, if included inpatient admissions are defined at the Healthcare Resource Group (HRG)[11] level, inpatient data needs to be available at an HRG level, too. The ability to centralise and integrate the various cost and utilisation data sets that are relevant to the risk-sharing arrangement will be crucial to setting baseline costs and performing ongoing monitoring of contract performance.

The system's ability to provide the proposed services should be verified as the contract will be ineffective if patients' access to included services is limited. Current waiting lists for the services should be checked and how these waiting lists are likely to change once the contract has been implemented should be analysed.

The nature of certain services with high costs or volatility and/or low frequencies (e.g., transplants) may mean that they cannot successfully be absorbed into the risk stream. Many of these services may already fall into the collection of services that are commissioned by NHSE. Those that are not could potentially be carved out of the risk-sharing contract. Conversely, the integrator may opt to take on some risk that is usually transferred to NHSE if it has the resources and skills to adequately manage these risks within its system. Exclusion principles could be developed to establish rules to guide these decisions. For example, services where the data quality is currently not high enough could be carved out until data quality improves.

Although having a clear definition of included services is vital, a focus on excluded services is also required. Firstly, the objective of the risk-sharing contract should be for the benefit of the system and patients as a whole. Secondly,

11 Healthcare Resource Groups (HRGs) are standard groupings of clinically similar treatments which use common levels of healthcare resource.

utilisation and behaviour regarding included services may also affect excluded services. For example, tighter controls around certain included services could increase the utilisation of excluded services. From this perspective (and depending on the objective of the risk-sharing agreement), including all CCG-commissioned services may be a more sensible approach as it ensures that the system is managed holistically while also removing the administrative burden of isolating a selection of services.

The scope of services could potentially extend beyond those commissioned by CCGs to those provided by local authorities and/or PHE. Some services provided by these entities are not strictly medical services and it should be determined whether including these nonmedical services in the contract is desirable. Further, social care services provided by local authorities will need to be aligned where multiple local authorities may be providing services within the same contract.

It would also be necessary to quantify administration costs and determine how they will be applied in the contract, to identify which stakeholder(s) will be responsible for these costs and to ensure that these costs are not double-counted and that the administration functions are not duplicated by multiple stakeholders.

Risk adjustment

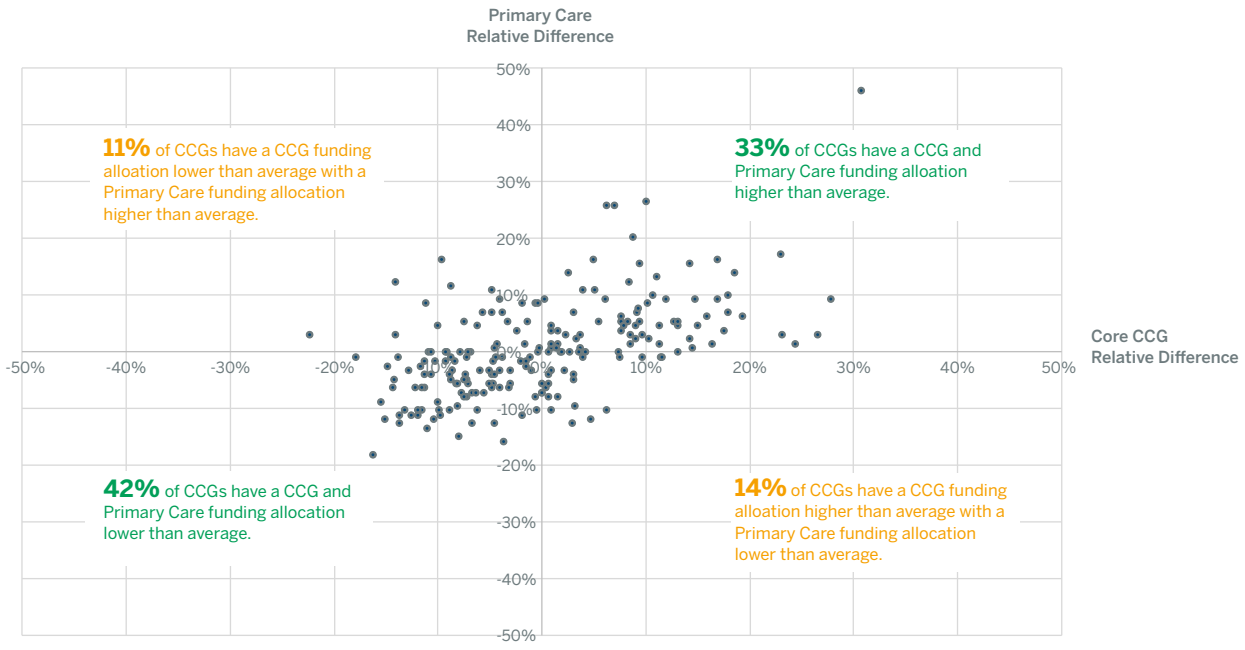
Over time, the risk profile of the population covered by the contract may change and risk adjustment could be applied to quantify and account for these changes. The risk adjustment factors could be used when recalculating capitation rates from one period to the next to protect the integrator from the risk of a worsening risk profile over time.

Performing the risk adjustment could be a complex undertaking from the data collection process through to the modelling stage. However, a complex risk adjustment methodology may not always be required. The funding allocation methodology used by NHSE to distribute funding to CCGs is essentially a form of capitation and the formula used includes risk adjustment. Consequently, even if you were to develop a methodology that perfectly explained the risk of the population, the flow of funding passed from NHSE to the CCGs is fixed. Thus, if the calculation reveals that the integrator requires additional funding, it is unlikely that it would be available in any case. Therefore, although it is important to understand the risk profile of the population to monitor trends and contract performance, it is possibly more ideal to have a risk adjustment methodology that is consistent with what has already been developed by NHSE.

Comparing each CCG area's funding allocation to the average funding allocation across all CCG areas can be used as an indicator for the level of risk adjustment applied to each CCG area. Performing an analysis of these differences for core CCG funding and primary care funding for the 2016/17 financial year allocations, we observe that the level of risk adjustment applied is not always consistent between core CCG and primary care funding. That is: Core CCG Relative Difference = (Core CCG funding allocation per CCG/Average Core CCG funding allocation - 1) and Primary Care Relative Difference = (Primary Care funding per CCG/ Average Primary Care funding allocation - 1).

For example, the graph in Figure 3 shows that 11% of CCG areas have a CCG Relative Difference that is less than zero, while their Primary Care Relative Difference is greater than zero and, similarly, 14% of CCG areas have a CCG Relative Difference greater than zero while their Primary

FIGURE 3: LEVEL OF RISK ADJUSTMENT IMPLIED BY CCG AND PRIMARY CARE FUNDING ALLOCATIONS FOR FY 2016/17



Care Relative Difference is less than zero. As a result, we observe that, in total, 25% of CCG areas have a core CCG funding allocation that is higher or lower than average, while the corresponding primary care funding allocation is lower or higher than average. In addition, for those where both allocations are higher or lower than average, the distances from the average can still vary significantly. This could be due to inconsistencies in the risk adjustment methodologies, different expected utilisation of core CCG and primary care services within the population and variation in the pace of change adjustments. These differences are possibly more reflective of historical differences rather than being a true reflection of future risk, and this could potentially inhibit the rate at which systems are able to transform their resource profiles.

A desirable risk adjustment methodology would consider factors that explain the structure and disease burden of the population. Adjusting for age, sex and deprivation levels would be one approach to understanding the population's disease burden and potential healthcare resource utilisation. When selecting a methodology to measure deprivation level, it will be necessary to ensure that this measurement is independent of the age/sex factors. NHSE's "Technical Guide to Allocation Formulae and Pace of Change" document explains that in developing the funding allocation formulae, a range of deprivation adjusters was investigated and they were all highly correlated with each other. Following this investigation, the Standardised Mortality Ratio (SMR) < 75[12] was selected as the interim measure of choice. This is calculated at a small area level and aggregated up to CCG level, which ensures that health inequalities are measured both within and between CCG areas. The merits of using SMR < 75 are that it can be updated regularly and applied at a small area level, but further work has been scheduled in this area to refine the methodology.

12 SMR <75 is a measure of how many more/fewer deaths there are in a particular area compared to the national average.

Measuring contract performance and risk share/gain share considerations

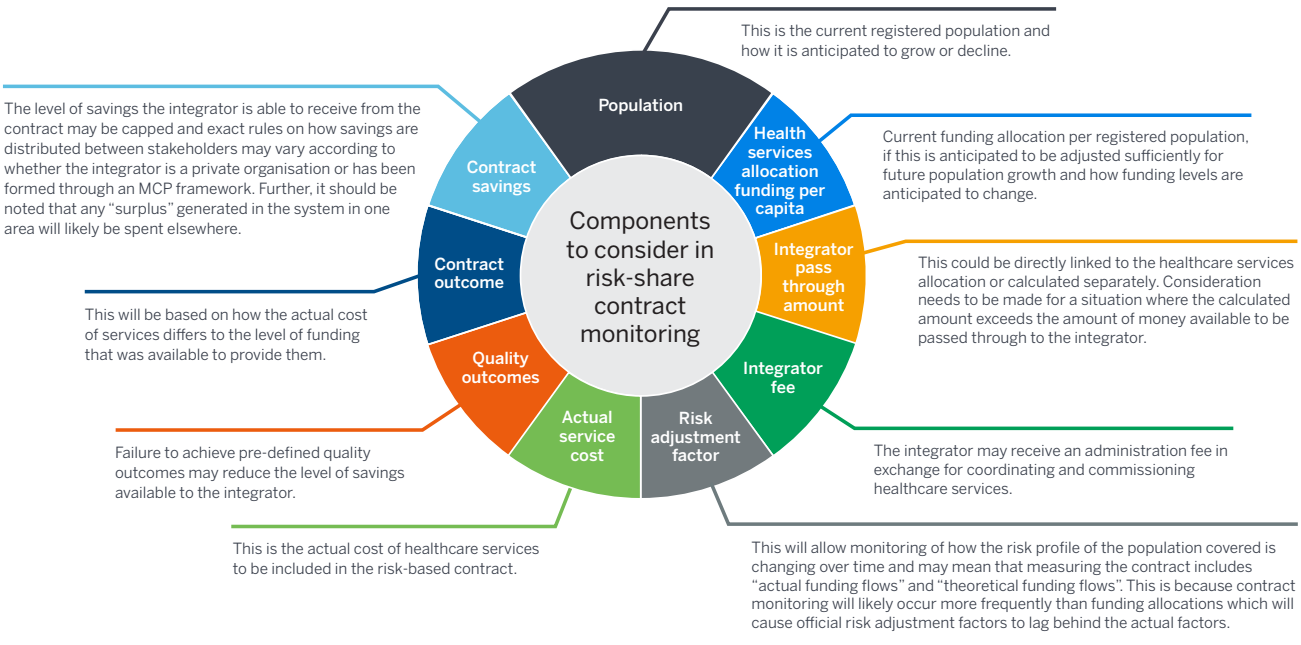
Once the risk-based contract has been implemented, ongoing monitoring will be essential to determine the extent to which the contract is meeting its desired objectives, to identify reasons for any failed objectives and to implement appropriate remedial solutions.

Successful contract monitoring will require frequent reporting, sufficient volumes and quality of data, clearly defined monitoring metrics and clear definitions of success and failure. Further, the results of the monitoring will need to be communicated to the appropriate stakeholders to ensure that there are early warnings of potential concerns.

Potential contract outcomes could be modelled by considering the metrics in Figure 4 and how they may change over time. Predefined scenarios in any of the components in Figure 4 could trigger outcomes such as rebasing the baseline costs, re-evaluating the services included in the contract or revisiting any and all aspects of the contract.

In conducting this ongoing monitoring, an important consideration will be whether the capitation amount passed through to the integrator is re-based following performance in the current year or if the baseline will be fixed at the

FIGURE 4: RISK-BASED CONTRACTING MONITORING CONSIDERATIONS



start of the contract. Regular re-basing will mean that each year the integrator has to achieve savings in addition to those that have already been baked into the system from previous successful years. However, not re-basing will mean that once the contract has been in force for a number of years, the baseline will no longer be relevant. A balance between these two scenarios needs to be achieved.

Risk corridors could be introduced into the savings calculation to ensure savings are not triggered by random variation in costs from year to year. For example, the success metric or risk share/gain share provision may specify that actual costs can deviate from the target by plus or minus a specified percentage before any risk share or gain share is triggered. The downfall of this approach is that gradual improvements over time may result in no official savings being recognised whereas a windfall improvement in a particular year (with the same net effect as the gradual improvements) will be recognised as a gain. The width of the risk corridor selected is important and should be aligned to the volatility of the population because a larger population would experience less volatility and consequently require a smaller risk corridor.

It is also important for the contract to include provisions for extreme scenarios. For example, if after the contract is in force, funding allocations are reduced, there may be a need to remove access to certain services. The process to make the decision regarding which services are limited and which stakeholder(s) make these decisions will need to be agreed within the contract.

A further thought on contract savings is that persistent savings could eventually lead to a reduced funding allocation passed through from NHSE to the included CCG areas because the cost of services in the relevant area is included in the funding allocation formulae. Ideally, the contracting parties would need assurances around these eventualities.

Conclusion

In regional NHS environments, implementing risk-based contracts that are in line with the principles outlined above can be effective mechanisms for STPs. These contracts are aligned with the main STP objectives in that they are centered on the population and encourage collaboration, working across organisational boundaries and transforming the system to deliver high quality care to the covered population in the most cost-effective manner. Designing risk-based capitation arrangements for these purposes will require careful consideration of how the traditional principles of capitation may and may not apply in this context, particularly because the funding flows differ from the traditional insurance environment. A detailed understanding of the internal and external risks (and how they may potentially trigger revisions to the contract terms), as well as a clear definition of the population and services covered, will assist in setting the baseline costs, determining the risk adjustment methodology (if any) and finally, measuring the contract performance and calculating any risk share/gain share that may result.

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