NHS England

Fundamental Review of Allocations Policy – Annex C: Technical Guidance to Weighted Capitation Formula for Clinical Commissioning Groups, 2013

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Fundamental Review of Allocations Policy – Annex C: Technical Guidance to Weighted Capitation Formula for Clinical Commissioning Groups, 2013

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Executive summary

This paper provides an overview of the current recommendations of the independent Advisory Committee on Resource Allocation (ACRA) for the weighted capitation formula for funding allocations to Clinical Commissioning Groups (CCGs).

The objective of the formula is to provide equal opportunity of access for equal need. The basic building block of the formula is the size of the population of each CCG, and then adjustments or weights per head for differential need for health care across the country. The weights per head are based on need due to age (the more elderly the population, the higher the need per head, all else being equal) and additional need over and above that due to age (this includes measures of health status and a number of proxies for health status). There is also an adjustment or weight for the higher costs of delivering health care due to location alone, known as the Market Forces Factor (MFF). This reflects that staff, land and building costs are higher in e.g. London than the rest of the country.

The paper also provides a brief guide to the Excel files which apply ACRA's recommendations to calculate the weighted populations for each CCG.

NHS England were concerned that while the formula accurately predicted need as currently met, it did not capture unmet need, and that the formula on its own would have resulted in higher allocations to areas with better health outcomes. NHS England decided not to use this formula for 2013-14 CCG allocations, but announced a fundamental review of allocations.

This guide and the Excel files are being published as a contribution to the fundamental review.

We welcome comments on the formula and Excel files, which may be sent to england.finance@nhs.net

1. Introduction

This paper provides an overview of the recommendations of the independent Advisory Committee on Resource Allocation (ACRA) for the weighted capitation formula for funding allocations to Clinical Commissioning Groups (CCGs). It also provides brief guide to the Excel files which apply ACRA's recommendations to calculate the weighted populations for each CCG.

Weighted populations are used to calculate target allocations. Each CCG's target allocation is the CCG's share of the total weighted population for England multiplied by the national available resources for CCG allocations. The weighted capitation formula has not been used to calculate CCG's running cost allowances.

This introduction provides an overview of the weighted capitation formula. The following sections provide more detail on the formula covering:

Section 2. Population

Section 3. Health and Community Health Services

Section 4. Prescribing costs

Section 5. Overall weighted capitation formula

The formula is based on independent academic research and references are provided at the end of the document to this research and other relevant publications.

NHS England were concerned that while the formula accurately predicts need as currently met, it did not capture unmet need, and that the formula on its own would have resulted in higher allocations to areas with better health outcomes. NHS England decided not to use this formula for 2013-14 CCG allocations, but announced a fundamental review of allocations.

This guide and the Excel files are being published as a contribution to the fundamental review. The Excel files are indicative as they do not necessarily use the latest data available for some components.

Traditionally, local commissioning organisations such as the former Primary Care Trust (PCTs) were not immediately given the allocations implied by the weighted capitation formula, but moved towards their target allocations over time under pace of change policy. Pace of change balanced providing stability in funding for all organisations with moving those furthest under target closer towards their target. ACRA's remit does not include pace of change policy.

ACRA's recommendations for the CCG formula are published on the gov.uk website and the reference is provided in Annex 1.

Overview of the weighted capitation formula

ACRA is an independent committee of NHS managers, GPs, academics and public health experts. The objective of the weighted capitation formula is to provide equal opportunity of access for equal need. The formula recommended by ACRA builds on the former formula for PCTs and on the former practice based commissioning toolkit.

The weighted capitation population is based on:

- each CCG's population;

- a weight, or adjustment, for need for health care services related to age (all else equal, areas with older populations have a higher need per head);

- a weight, or adjustment for need over and above that due to age (all else equal areas with poorer health have a higher need per head);

- a weight, or adjustment, for unavoidable costs due to location (eg higher unit staff costs and higher costs of land and equipment) and the emergency ambulance cost adjustment (EACA).

The weighted capitation formula calculates the relative need of each area's population and is also known as the fair shares formula. It does not seek to measure an absolute level of need for each area, only relative need across areas.

Each CCG's population for the formula is the registered list of each GP practice in each CCG.

People do not have identical needs for health care services. A key difference is that need varies according to age and gender, and in particular the very young and elderly, whose populations are not evenly distributed across the country, have a higher need for health services than the rest of the population. The weighted capitation formula therefore takes into account the relative need per head of different age-groups and the different age structures of local populations.

Even when differences due to age are accounted for, populations with the same age profiles display different levels of need. An additional adjustment to reflect the relative need for health services over and above that due to age is therefore necessary.

Observing need per head directly has not proved possible to date. Instead statistical modelling by academic researchers has examined the relationship between the utilisation of health services on the one hand, and the characteristics of local populations and the area where they live on the other hand. These models have been used to decide which factors to include in the formula to predict future need per head.

Typically the models estimate age related need and additional need over and above that due to age formula as a single set of weights rather than separate weights for age and additional need. This is because additional need varies by age.

As the need for different types of health services varies, there are separate formulae for general and acute, mental health, maternity and prescribing. These are combined to form the overall need weighted capitation formula.

The costs of providing health care unavoidably vary across the country due to different input costs, in particular staff costs and the costs of land and buildings. The weighted capitation formula includes an adjustment for these unavoidable costs, known as the market forces factor (MFF). These costs are due to location alone, not need.

In addition, the emergency ambulance cost adjustment (EACA) adjusts for unavoidable differences in the cost of providing these service across the country, particularly in sparsely populated areas.

It is not possible in this document to give full details of the models provided by the academic research. However, references to this research are provided in Annex 1.

2: Population

The starting point for the weighted capitation formula is each CCGs population. The population used is the sum of the registered lists of each GP practice in the CCG. The registered lists are used irrespective of the patients' place of residence. This follows the guidance *Who pays? Determining responsibility for payments for providers.*

It is recognised that using registered lists does not take into account people who are not registered with a GP practice. ACRA considered whether an adjustment should be made to the formula for unregistered populations, but due to the absence of data available on the size of the unregistered population by area and their healthcare needs, concluded it is not presently possible to do so.

The aim is to use the latest population data available, although it is recognised that this may not capture the most recently opened GP practices or closed GP practices. However, it is likely that registrations moving to new or from closed GP practices will be within the same CCG.

Excel file: Registrations

This gives the number of registrations by GP practice and CCG, broken down by age-group and gender. It uses registrations as at April 2012.

3: Hospital and Community Health Service Component

There are two steps in calculating HCHS weighted populations. The first is to weight or adjust for need and the second is to weight or adjust for unavoidable costs.

The basic approach in calculating need weighted populations is to multiply the population for each age/gender group for each GP practice by the relative need per head estimated by academic researchers. The products for each age/gender group are summed to give the relative need weighted population for each GP practice. The weighted populations for GP practices are summed to give the relative need weighted populations for each CCG.

 The market forces factor and the emergency ambulance cost adjustment (EACA) covering unavoidable costs are then added for each CCG.

Within HCHS, need per head differs for general and acute, mental health and maternity, and the HCHS weighted populations are therefore built up from these separate components. Each is discussed in turn below.

General and acute need per head

Need per head was estimated by the Nuffield Trust using a person based approach, building on the research for the former practice based commissioning toolkit.

The Nuffield Trust's research covered inpatient and outpatients for general and acute and also covered accident and emergency. Mental health, maternity and specialised services were excluded. CCGs are not responsible for commissioning specialised services, which are directly commissioned by NHS England.

The Nuffield Trust estimated relative need based on past patterns of utilisation of health services compared with the characteristics of patients. The quantified relationships found are taken to be predictors of relative future need for health care services, with the exception of supply variables (see below).

The Nuffield model used anonymised data on the diagnoses for each patient admitted to hospital in 2007-08 and 2008-09, their age, and their GP practice. The number of anonymised registrations by age-group and gender were also obtained for each GP practice to provide information on the proportions of a GP practice's list using health care in 2007-08 and 2008-09.

Other data included in the model were data from the population census and 'attributed' to individuals - these are data only available for small geographical areas (LSOAs) rather than for each individual. They include data such as the

proportion of people from black and minority ethnic groups, and the proportion of people aged 16-74 in semi-routine occupations[1].

The model estimated the relationship for individuals between these 'explanatory' variables for 2007-08 and 2008-09 and actual costs for the individuals in 2009-10. The modelling tested from a wide range of potential variables which were the best in statistical terms, and were also plausible indicators of need, to be included in the final model. It was found that diagnoses and age were the most important variables in the model.

The utilisation of health care may also be affected by the relative availability of health care services. Variables were included in the model to adjust for this, known as supply variables. These variables included for example distance travelled to outpatient appointments and the number of operating theatres. While these variables were included in the models as they affected utilisation, they were not included in the formula to calculate weighted populations, instead their value for each area was set to the national average. This means if an area has lower use of health care services because of lower capacity or distance, this is corrected for in the formula.

It is assumed that the predictors of need in 2009-10 are also accurate predictors of need in subsequent years.

Excel file: Need per head (general and acute sheet)

Warning – this is a very large file.

This gives the need per head for each age-gender group for each GP provided by the Nuffield Trust.

Where need per head was not available from the Nuffield Trust for new practices, the average need per head by age-gender group in the CCG was used.

The file also shows the sum from multiplying need per head by the population for each age-gender group. This gives the need weighted populations and thus the relative need by GP practice for general and acute.

The Z lists weighted populations sheet gives the results from multiplying the Z lists by the average CCG need per head by age-gender group for general and acute.

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[1] One of the variables included was the ratio of ONS populations to GP registrations. This variable was by NHS England updated to take into account the results of the 2011 Census.

Mental health need per head

The need per head for mental health services was estimated by a team led by Manchester University and followed a similar utilisation based approach to the Nuffield Trust, and is known as the person-based resource allocation for mental health (*PRAMH*) formula.

The PRAMH model is based on analysis of the Mental Health Minimum Dataset (MHMDS) over the period 2008-09 to 2010-11. The MHMDS covers specialist mental health services within hospitals, outpatient clinics and the community. Very specialised mental health services which will not be commissioned by CCGs were excluded from the research.

As a relatively small percentage of the population use mental health services in a year, the researchers recommended a two-stage model. The first stage models the proportion of individuals who use mental health services, and the second stage models the costs for the service-using population. The modelling for both stages was undertaken for each age-gender group for each GP practice.

There are separate models for those age 20-64 and those aged 65 and over, and for males and females for each of these age-groups. This is because relative need differs between these groups, the latter being heavily influenced by dementia and related illnesses.

The explanatory variables in the models include for example age, psychiatric diagnosis, severe mental illness prevalence from the quality and outcomes framework (QoF), categories of condition of mental health severity, proportion who are single, and ethnicity.

As for general and acute, supply variables were included in the model but set to the national level in the calculation of weighted populations. The supply variables included for example the existence of a nearby mental health provider and distance to mental health team base.

The available data for the research did not cover those age under 20 and so an alternative method was used for calculating mental health need per head for the four age bands under 20. The method used bed days and outpatient data with mental health diagnostic codes from the HES to estimate the national hospital cost per head by age-group. The costs for those aged under 20 were expressed as a percentage of those aged 20-24. These national percentages were applied to the need per head from the PRAMH project for those aged 20-24 for each GP practice as estimates of the need per head for the age-groups aged under 20. As the use of mental health services by those aged under 20 is relatively low, it is unlikely this approach significantly affects the overall mental health weighted populations.

> **Excel file: Need per head (mental health sheet)**
>
> **Warning – this is a very large file.**
>
> **This gives the need per head for each age-gender group for each GP provided by the PRAMH research team and the estimates for those aged under 20 as described above.**
>
> **Where need per head was not available from the PRAMH team for new practices, the average need per head by age-gender group in the CCG was used.**
>
> **The file also shows the sum from multiplying need per head by the population for each age-gender group. This gives the need weighted populations and thus the relative need by GP practice for mental health.**
>
> **The Z lists weighted populations sheet gives the results from multiplying the Z lists by the average CCG need per head by age-gender group for mental health.**

Maternity need

The maternity model is based on the number of births and the cost per birth. The model is from the *Combining Age Related and Additional Need (CARAN) report.* The cost per birth is based on a model which found the best explanatory variables to be the proportion of births which are low rate births and mean house price in the local area.

> **Excel file: Summary GP practice shares by CCG (weighted regs by GP practice sheet)**
>
> **Warning – this is a very large file.**
>
> **This gives the maternity need weighted populations for each GP practice**

Combining the general and acute, mental health and maternity need

weighted populations

The need weighted population for HCHS as a whole combines the general and acute, mental health, and maternity need weighted populations.

The shares of each of these components in the overall HCHS need weighted population are based on recent expenditure on each of these. No formula is available for community health services and it is assumed that the general and acute and mental health formula are also representative of community health services.

Excel file: Summary GP practice shares by CCG

This file gives the shares for each of general and acute, mental health and maternity in the overall HCHS need weighted populations. The shares are currently based on the PCT summarised accounts for 2011-12 adjusted to exclude PCTs' spend on public health and on services to be commissioned directly by NHS England.

It also give the need weighted population for each GP practice and CCG.

Unavoidable cost

There are two adjustments for unavoidable costs, the market forces factor (MFF) and the emergency ambulance cost adjustment (EACA).

Market forces factor

The MFF adjusts for the unavoidable cost differences between areas due to location alone. For example it typically costs more to run a hospital in a city centre than in other areas due to higher staff, buildings and land costs.

The MFF currently used is based on that calculated for former PCT allocations and the methodology is set out in *Resource Allocation: Weighted Capitation Formula, Seventh Edition*. There are four components to the MFF: unavoidable differences in cost across the country due to each of medical and dental staff, other staff, land, and buildings.

The MFFs last calculated for each provider is the starting point. The MFF for each CCG is calculated from the MFFs of providers where each member GP practice's patients received inpatient and outpatient treatment. The CCG MFF is the average of providers' MFFs weighted by the activity (costed using payment by results tariffs) undertaken by each provider for patients registered with each CCG's GP practices. The current CCG MFFs are based on 2012-13 tariff (excluding best practice tariffs) and 2010-11 HES activity.

The CCG MFFs are expressed as an index, with the England average set to the value 1.0. The same MFF index value is applied to each of general and acute, mental health and maternity.

Emergency Ambulance Cost Adjustment

The Emergency Ambulance Cost Adjustment (EACA) adjusts for unavoidable variations in the cost of providing emergency ambulance services in different geographical areas, and in particular sparsely populated and metropolitan areas.

The EACA currently used is that for PCTs mapped to CCGs based on geographical boundaries The methodology for the PCT EACA is set out in *Resource Allocation: Weighted Capitation Formula, Seventh Edition*.

The CCG EACAs are expressed as an index, with the England average set to the value 1.0. The same EACA index value is applied to each of general and acute, mental health and maternity.

Final HCHS Weighted Population

The final HCHS need and cost weighed populations for each CCG are calculated by multiplying the need weighted populations by the MFF index and EACA index. The products of this calculation for each CCG are then scaled by the same value so that the sum of the weighted populations equals the total unweighted or crude population (this is also sometimes known as normalising). Scaling does not affect the relativities between CCGS.

Excel file: Summary GP practice shares by CCG

This gives the normalised need weighted populations by GP practice for each of general and acute, mental health and maternity.

The sum of the GP weighted populations gives the CCG weighted populations.

This file also gives the MFF and EACA index for each CCG and the need and cost weighted populations for each CCG.

4: Prescribing Component

The prescribing component covers medicines prescribed in primary care. There is first an adjustment for need related to age and gender and then an adjustment for additional need over and above that due to age.

The adjustment for age and gender uses the weights developed by the Prescription Support Unit (PSU) known as ASTRO(09)-PUs .

The second adjustment made for prescribing need over and above that due to age and gender is from the *Report of the Resource Allocation for Mental Health and Prescribing (RAMP) project*. This is the same as used for the former PCT formula, and which was originally calculated for each GP practice and then aggregated to PCTs.

The model for additional need includes both need and supply variables as for the other components. The variables are set out *in Resource Allocation: Weighted Capitation Formula, Seventh Edition*. The need variables include for example the Low Income Scheme Index (LISI), the proportion of those aged 70 years and over claiming disability living allowance (DLA), and the standardised mortality ratio.

The PRAM model and ASTR0(09)-PUs were applied for each GP practice and the GP practice weighted populations summed to give the CCG weighted populations.

The prescribing component is not adjusted by the MFF or EACA as the costs of prescribed medicines are the same throughout the country.

Excel file: Need per head (prescribing)

Warning – this is a very large file.

This gives the need per head index for each age-group for each GP practice.

Where need per head was not available from the PRAM team for new practices, the average per head by age-gender group in the CCG was used.

Excel file: Summary GP practice shares by CCG

This file gives the prescribing need weighted population for each GP practice and for each CCG.

5: Overall weighted capitation formula

The overall weighted populations for CCGs combines the HCHS need and cost weighted populations and the prescribing need weighted populations. The relative shares of the overall weighted population are from PCT 2012-13 planned spend excluding specialised services and public health.

Excel file: Summary GP practice shares by CCG

This gives the overall weighted populations for each CCG.

Table 1 is designed to allow CCGs to view their member GP practices showing the unweighted population and the HCHS and prescribing need weighted population for each GP practice. The weighted populations in Table 1 do not include the MFF and EACA.

Annex 1: References

ACRA's recommendations for the CCG formula are available at:
https://www.gov.uk/government/publications/ring-fenced-public-health-grants-to-local-authorities-2013-14-and-2014-15

Combining Age Related and Additional Needs (CARAN) report
http://webarchive.nationalarchives.gov.uk/20120503034600/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_093169.pdf

Department of Health, Resource Allocation: Weighted Capitation Formula, Seventh Edition
http://webarchive.nationalarchives.gov.uk/20120503034600/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_124946

NHS England, *Who pays? Determining responsibility for payments for providers.*
http://www.england.nhs.uk/wp-content/uploads/2012/12/who-pays.pdf

Nuffield Trust *Person-based Resource Allocation Research Summary*
http://www.nuffieldtrust.org.uk/publications/person-based-resource-allocation-new-approaches-estimating-commissioning-budgets-gp-pra?gclid=CPfKgcHY-rgCFS3HtAod1zEAFg

Report of the Resource Allocation for Mental Health and Prescribing Project (RAMP)
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Sutton Matt, Soren Rud Kristensen, Yiu-Shing Lau, Gyles Glover, William Whittaker, John Wildman, Hugh Gravelle, Peter Smith *Developing the Mental Health Funding Formula for Allocations to General Practices, Estimation of a formula for mental health services based on person-level data (PRAMH)*