Classification: Official

Publication reference: PR1831`

NHS England

Technical guide to allocation formulae and convergence

For 2023/24 and 2024/25 allocations

February 2024

Contents

1 Summary

1.1 Overview

The allocation of funding to Integrated Care Boards (ICBs) to support them in commissioning services for their local population is one of the key duties of NHS England.[1] The long-standing approach we take in setting allocations, previously for clinical commissioning groups and now for ICBs puts the principle of ensuring equal opportunity of access for equal need at the heart of our approach to allocating budgets.

The approach is also informed by NHS England's duty to have regard to the need to reduce inequalities between patients with respect to their ability to access services and with respect to the outcomes they achieve.[2]

These two aims are reflected in the target formula, which produces a target allocation or 'fair share' for each area, based on a complex assessment of factors such as demography, morbidity, deprivation and the unavoidable cost of providing services in different areas.

The formula is based on independent academic research and is overseen by an independent external group, the Advisory Committee on Resource Allocation (ACRA), which provides advice to the Secretary of State for Health and Social Care and the Chief Executive of NHS England.

Allocations will therefore differ depending on the exact combinations of these factors in each area, as well as how quickly an area can be moved towards its target allocation each year, determined by our convergence (previously 'pace-of-change') rules.

This process aims to be transparent, and to ensure that changes in allocations do not result in the destabilising of local health economies.

This document describes how ICB allocations are calculated. The allocations process has been in existence in broadly this form since 1976 and has been continually improved and updated as clinical services have changed, the NHS has been re-structured, and more and better data and analytical techniques become available.

We welcome comments and feedback on our approach. In particular, the Advisory Committee on Resource Allocation are currently developing their research and development programme for the next round of allocations. Suggestions for work that might be included there and comments about the wider process, such as the convergence policy can be sent to the NHS England allocations team at england.revenue-allocations@nhs.net.

[1] Section 223G NHS Act 2006, as amended by the Health and Social Care Act 2012 and the Health and Care Act 2022

[2] Section 13G NHS Act 2006, as amended by the Health and Social Care Act 2012 and the Health and Care Act 2022.

1.2 Main changes to the allocation formula

There are limited changes to the allocations formula compared with the formula used for 2022/23. These changes are set out below and are described in more detail within this technical guide and the supporting documents.

1) The initial population uses an annual average of GP registered list sizes from November 2021 to October 2022. This is consistent with the methodology for calculating list sizes used in the 2019/20 allocations round. For 2022/23 allocations the GP registered list size as at October 2021 was used. The single month registered population was used for that round of allocations only and reflected the differential impact of recent changes in registered populations caused by the Covid pandemic, which were unlikely to be representative of future allocations.
2) The component for specialised services has been refreshed by running new statistical models using new data sources. Allocations will be informed by this model for the first time in 2024/25.
3) The introduction of a travel time adjustment for the community services model.
4) An update to the values of the market forces factor (MFF).
5) A change in the weighting of the ICB core services adjustment for health inequalities and unmet needs from 10% to 10.2%.

Other than data updates, the following areas of the model have not had any methodological changes:

- The general and acute model
- The mental health model
- The prescribing model
- The maternity model
- The health inequalities adjustment
- The emergency ambulance cost adjustment (EACA)
- The primary medical care model

1.3 Changes to this document

This document is an update to the allocations technical guide for 2023/24 and 2024/25 published in March 2023. The changes in this document are:

- Updates to reflect changes to allocations for 2024/25
- Addition of a section describing the specialised services allocations model
- A description of specialised services convergence
- Update to the section on running costs to reflect changes made for 2024/25 and 2025/26.

2 Introduction

2.1 How allocations were set

2.1.1 Overall allocation quantum

The total NHS budget for the years 2022/23 to 2023/24 was set in the Spending Review in October 2021 (SR21) and was updated at the Autumn Statement 2022.

Table1: Autumn statement (AS22) settlement, £m

AS22 settlement, £m	2021/22	2022/23	2023/24	2024/25
Original NHS Long Term Plan mandate	133,283	139,990	148,467	151,629
2021/22 Covid funding	16,295			
SR21 settlement		8,989	6,085	8,161
AS22 settlement			3,020	3,210
Other adjustments (including £2.85bn for pensions)	1,476	4,292	3,606	3,727
Total mandate (nominal)	151,054	153,271	161,178	166,727

2.1.2 Commissioning stream allocations

Allocations for each commissioning stream have been set taking into account expected price inflation, activity growth, NHS Long Term Plan required levels of efficiency and the impact of the SR21 settlement regarding Covid costs and elective recovery funding.

Core ICB funding in 2023/24 grew by 4.62% against 2022/23 baselines. This was based on the following assumptions:

- The 2022/23 baselines now take account of in-year funding for pay and inflation, make additional health inequalities and maternity funding recurrent, and are adjusted to reflect the outcome of the baseline reset exercise to correct baseline contract funding between commissioners following the end of the Covid financial regime.
- Covid allocation. This is transferred into core allocations reflecting that Covid is now an ongoing pressure on NHS services. The quantum of funding reduces compared to 2022/23 in line with the shape of the SR settlement.
- Growth funding is provided for inflation (updated for inflation forecasts), efficiency, and activity. This includes funding to deliver the Mental Health Investment Standard and increase investment in community services.
- An additional reduction is applied to remove part of the excess indirect impacts of Covid, consistent with the SR21 settlement.
- Further resources are added to provide resources to maintain and expand capacity funding allocated for 2022/23 and distribute additional funding to support discharge which flows through the Better Care Fund.

In 2024/25, the following additional funding has been allocated after base growth and convergence have been applied (see section 9):

- Additional funding for virtual and physical urgent and emergency care capacity.
- Funding for commissioning COVID-19 testing.

ICBs also receive allocations for

- Primary care (GP services), the contractual commitments of the GP contract are the main driver of the funding requirement. The core allocation quantum remains in line with the NHS Long Term Plan allocations after updates to reflect contractual and service changes. Baseline changes are also made to transfer previously allocated GP access funding from core ICB allocations and Service Development Fund into the primary care (GP) allocation. Allocations have been updated for 2024/25 to include additional funding to implement the outcome of the Review Body Doctors' and Dentists' Remuneration recommendations.
- Specialised services. From 2024/25 allocations will be made for specialised physical health services, supporting delegation of these services to ICBs.
- Other primary care services (pharmaceutical, ophthalmic and dental). To reflect delegation of these services to ICBs.
- Service Development Funding (SDF). Resources available to deliver a number of priorities in the NHS Long Term Plan, including additional services above core provision in mental health, primary care, cancer and diagnostics are included in this budget line which grows to reflect commitments to increase spending in these areas. This funding is allocated based on an assessment of the requirements for each programme rather than using the formula approach described in this document.
- Elective recovery. Additional funding from the SR21 settlement.
- Running costs.

2.1.3 Advisory Committee on Resource Allocation (ACRA)

ACRA is an independent, expert, technical committee that makes recommendations to NHS England on the target formula for NHS allocations and to the Department of Health on the target formula for public health allocations. ACRA's remit does not include convergence policy, which is set by NHS England for NHS allocations. ACRA's membership includes academics, GPs, NHS managers and public health experts.[3]

The formulae recommended by ACRA are based on research, and references to the research and other relevant publications are provided in Annexes 2 and 3.

ACRA was established in 1997 as a successor to the different committees that over time have provided advice on NHS allocations formulae, starting with the Resource Allocation Working Party of 1976.

2.1.4 Steps in setting allocations

Once the national budgets are known, there are four steps in the calculation of actual allocations:

- determine target allocations based on relative need and relative unavoidable costs
- establish baselines (usually the previous year's allocations plus any adjustments, the baseline is set as described in section 2.1.2
- calculate opening distances from target (baseline minus target)

[3] ACRA terms of reference; NHS England » Advisory Committee on Resource Allocation (ACRA) terms of reference

- determine each ICB's allocation growth based on their opening distance from target and convergence model.

The approach for calculating ICB running cost allowances is necessarily different.

2.2 Scope of the technical guide

2.2.1 Funding streams covered

This guide provides an overview of the calculation of the allocations for 2023/24 and 2024/25.

The guide covers:

- the calculation of the formulae for core ICB, physical health specialised services and primary medical care target allocations
- convergence policy
- ICB running cost allowances.

2.2.2 Allocations spreadsheets

The technical guide includes this document and a set of workbooks which show the calculation of target and actual allocations for core ICB responsibilities and primary medical care. This document also provides a brief guide to the workbooks. The workbooks include detailed notes on data sources and the calculations.

Due to the large size of many of the workbooks, many values have been hard coded for publication rather than driven by Excel formulae. Where this is the case, the notes in the files explain the relationship between the columns in the workbooks. The calculations have also been set out over several separate files, also for reasons of size. A list of the accompanying workbooks is in Annex 3.

2.2.3 Weighted capitation formulae

The formulae for target allocations estimate the relative need and relative unavoidable costs between ICBs for healthcare services. Target allocations are based on the weighted capitation formulae recommended by ACRA. There are separate formulae for ICBs' core responsibilities, specialised services and primary medical care. For each of these, weighted populations are calculated for each ICB, and each ICB's target allocation is the ICB's share of the total weighted population for England multiplied by the target national budget for the relevant funding stream.

Weighted populations are calculated for each ICB for the baseline year of 2022/23 and each of the years 2023/24 to 2024/25, based on the projected registered population for each area for each year.

An overview of the weighted capitation formulae is below. The subsequent sections provide more detail on the formulae and policy for convergence.

References to the research and modelling are provided in Annexes 2 and 3.

2.3 Overview of methodology for the weighted capitation formula

2.3.1 Methodology

An overview of the approach for calculating weighted populations is below. The detailed differences in the calculations for ICB core responsibilities, specialised services and primary medical care are set out in the subsequent sections and the accompanying workbooks.

2.3.2 Weighted populations

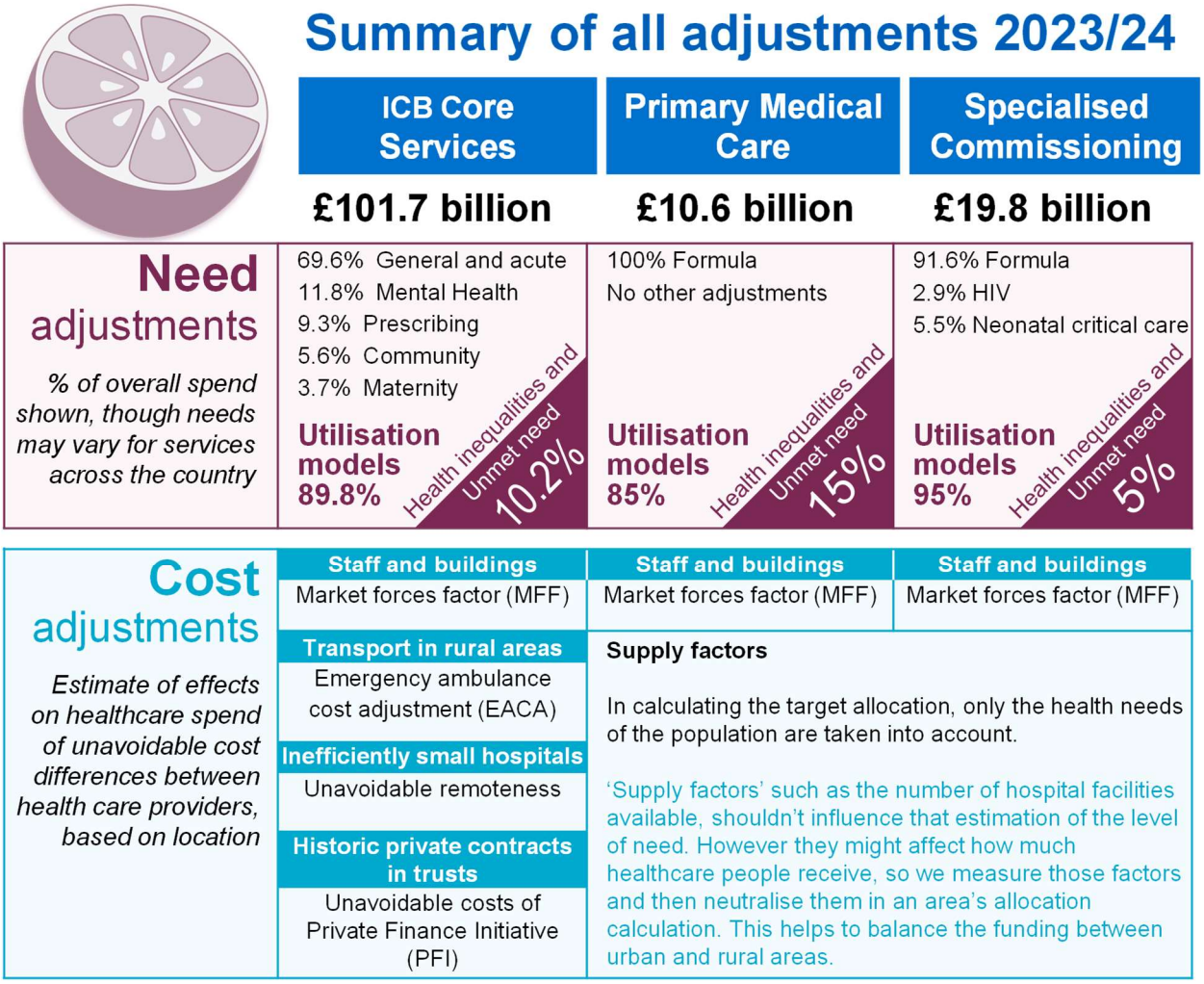
The weighted population for each ICB is based on:

- the size of each ICB's registered population
- a weight, or adjustment, per head for need for health care services related to age and sex (all else being equal, areas with older populations typically have a higher need per head) and for need over and above that due to age and sex (all else being equal, areas with poorer health have a higher need per head)
- a weight, or adjustment, per head for unmet need and health inequalities
- a weight, or adjustment, per head for unavoidably higher costs of delivering health care due to location alone, known as the market forces factor (this reflects that staff, land and building input costs are higher in some parts of the country, particularly London, than in others)
- an adjustment in the core ICB formula for the higher costs of providing emergency ambulance services in sparsely populated areas, an adjustment for the higher costs of unavoidably small hospitals with 24-hour accident and emergency services in remote areas and an adjustment for the unavoidable costs of the private finance initiative (PFI).

As the need for different types of health services varies across the country, there are separate formulae for each of ICB core responsibilities, specialised services and primary medical care. Within each of these, there may be separate components and adjustments – for example the distribution of need for ICB core responsibilities is different between general and acute, mental health, community and maternity services.

The different components and adjustments for unavoidable costs are summarised in **Figure 1** and more details on each are provided in the relevant sections of this document.

Figure 1: Summary of ICB formula and adjustments



Each formula within the overall place-based model represents a national budget stream. Within each formula, segments may include evidence of variation in 'need' or 'cost'. The relative weight of unmet need is determined by the NHS England board. Weighted populations are calculated for each component/ segment. The **target allocations** are a combination of the target shares (need adjustments), their relative weight and cost adjustments. Impact of each segment is determined by relative spend.

2.3.3 Fair shares formula

The weighted capitation formula estimates the need per head of each ICB's population relative to other ICBs and is also known as the fair shares formula. It does not seek to calculate an absolute level of need for each area, but to assess relative need (and relative unavoidable costs) between areas.

2.3.4 Population base

The initial populations used in the formula for each ICB are the annual average registered lists of all their associated GP practices from November 2021 to October 2022. These are then projected forward for each year 2023/24 and 2024/25, based on

Office for National Statistics' age-sex specific residential population projections for local authority districts (LADs).[4]

2.3.5 Variation in need

People do not have identical needs for health care services. A key difference is that need varies according to age and sex. 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 account of the relative need per head of different age-sex groups and the different age-sex profiles of local populations.

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

2.3.6 Utilisation approach

Statistical modelling has been used to examine the relationship between the utilisation of health services, and the characteristics of individual patients and the areas where they live. These models have been used to decide which factors to include in the formula to predict future need per head and the relative weight on each of the factors.

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

2.3.7 Supply side variables

The statistical models also include 'supply' variables to take account of the greater availability of health care services generally leading to higher use for the same level of need. As utilisation driven by available capacity is not a reflection of need, while the supply variables are included in the models, they are sterilised and set to the national average when calculating weighted populations. This means areas are not penalised in the formula for lower utilisation due to relatively lower or less accessible capacity.

2.3.8 Market forces factor (MFF)

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

2.3.9 Emergency ambulance cost adjustment

The emergency ambulance cost adjustment (EACA) adjusts for unavoidable differences in the costs of providing these services across the country, particularly in sparsely populated areas due to for example the longer distances to incidents and conveying patients to hospitals. The EACA is only included in the formula for ICB core allocations.

---

[4] ONS 2018 Subnational population projections for LADs

2.3.10 Costs of unavoidable smallness

In the formula for ICB core allocations there is an adjustment for the higher costs of running unavoidably small hospitals with 24-hour A&E departments in remote areas. These hospitals are typically unable to achieve the same economies of scale as other hospitals.

The adjustment is based on modelling the costs at site level for all hospitals to give a 'cost-curve', showing the estimated relationship between the size of hospitals and costs. Criteria were developed to identify the hospitals that were unavoidably small due to remoteness. These were based on the size of the population served being relatively small, and travel times to other hospitals being relatively long. The 'cost-curve' gave the estimated higher costs for the remote hospital sites.

2.3.11 Excess finance costs of the private finance initiative (PFI)

This adjustment was introduced for the 2022/23 allocations round to reflect the impact of excess finance costs relating to historical PFI contracts. Several trusts with PFI obligations have previously been in receipt of direct payments based on historical analysis undertaken by DHSC in 2011. The new approach replaces these direct payments with a consistent methodology and is focussed on the additional finance costs some trusts pay in PFI contracts compared to public sector financing.

The EACA, the adjustment for the costs of unavoidable smallness due to remoteness and the PFI adjustment capture higher costs over and above those covered by the MFF.

2.3.12 Rurality

There are a range of adjustments made in the core ICB allocations formula that account for the fact that the costs of providing health care may vary between rural and urban areas. Target allocations include three adjustments that specifically support remote or sparsely populated areas:

- the emergency ambulance costs adjustment to reflect longer travel times in sparsely populated areas
- an adjustment to remove from the formula supply induced demand in urban areas where people live close to a hospital
- the adjustment for unavoidable small hospitals, to support continued provision by hospitals with 24/7 A&E services that are remote from the wider hospital network and have unavoidably higher costs.

Some of the differences between rural and urban areas, such as the tendency for rural populations to be older, are naturally captured in the formula.

2.3.13 Unmet need and health inequalities adjustment

NHS England has a strong commitment and legal duty to have regard to the need to reduce health inequalities. One way we meet this legal duty is through the approach to allocations. We also recognise that our utilisation-based approach to measuring healthcare needs will not necessarily fully capture needs that are not being met. An adjustment is made in the allocations formula to account for health inequalities and unmet needs.

To take account of health inequalities and unmet need in the allocations formula, and following a review of the health inequalities adjustment,[5] ACRA have recommended that a measure of avoidable mortality is the best available indicator on which to base the adjustment. The adjustment is calculated for the population of each small area and then aggregated to ICB level. Applying the measure at the small area level takes into account unmet need/health inequalities within as well as between ICBs.

ACRA are not able to make an evidence-based recommendation on how much funding should be redistributed through the unmet need adjustment. The share will remain at 5% for the specialised services formula and 15% for primary medical care. In 2022/23 ICB core allocations, an additional £200m health inequalities funding was made available to systems, distributed using the health inequalities and unmet need adjustment. For 2023/24 this has been absorbed into the ICB programme baseline and the weighting of the health inequalities and unmet need adjustment has been increased from 10% to 10.2% to preserve its value in the target distribution.

The different weightings used in primary medical care, core and specialised commissioning targets reflect a judgement on the relative importance of these streams in addressing unmet need and health inequalities.

3 Population base

3.1 Calculating ICB estimated registrations

3.1.1 GP registered lists

The starting point for the weighted capitation formula is each ICB's population. The populations used are the registered lists of all member GP practices of the ICB as published by NHS Digital.

For 2023/24 and 2024/25 allocations the baseline population is calculated as a 12 month average of GP registrations by quinary age-sex group over the period November 2021 to October 2022. This is to better reflect seasonal patterns in some areas, such as areas with high numbers of students or seasonal workers.

This is a return to our previous approach; for the 2022/23 allocations only, ACRA recommended using a single month snapshot of GP registrations (October 2021) to set the baseline population. This was to minimise the impact on allocations of changing patterns of GP registration caused by the Covid pandemic. The pattern of growth of GP registered populations for the last 12 months follows the pattern as before the pandemic and therefore ACRA have recommended a return to using a 12 month average to calculate the registered population for 2023/24 and 2024/25 allocations.

GP registered lists are used irrespective of the patients' place of residence or where they use NHS services, consistent with the responsible commissioner guidance[6].

3.1.2 Projected registered lists

[5] See https://www.england.nhs.uk/publication/research-reports-on-the-allocations-formulae-2022-23/

[6] https://www.england.nhs.uk/publication/who-pays-determining-which-nhs-commissioner-is-responsible-for-commissioning-healthcare-services-and-making-payments-to-providers/

The GP registrations for November 2021 to October 2022, aggregated to ICB level, are projected forward to give estimated GP and ICB registered lists for each year from 2023/24 to 2024/25.

In the 2019/20 allocations round this was done using the ONS projections for resident populations in CCGs by quinary age-sex group. If population growth in an area is disproportionately in a younger or older population – which will affect relative levels of need – this is reflected in the changes in need-weighted populations over time. The percentage growth in CCGs' age-sex registrations were assumed to be the same as the projected percentage growth in their age-sex resident population.

As ICBs are generally much larger than CCGs, the local authority district (LAD) projected populations are now applied to GP practice populations as this will allow for more local variation in population projections to be captured.

The ONS projected populations are the 2018 based Sub-National Population Projections[7] (SNPPs) published at LAD age-sex level. These projections start with the 2011 Census populations, which are rolled forward to 2018 by adding the number of births and net migration and subtracting the number of deaths. Trends for the fertility rates, death rates and net migration are used by the ONS to project forward from 2018. The equivalent rates using the 2021 Census are not yet available.

The sizes of ICBs' registered lists differ from the sizes of the ONS resident populations. This is for several reasons, the largest of which is cross-boundary flows: people who are registered with one ICB but reside in a different ICB. Other reasons include people who are entitled to register with a GP practice but are excluded from ONS populations because they have not yet been resident in the UK for 12 months, unregistered patients who are included in ONS populations, and patients for whom there is a delay in removal from registered lists, for example following a move abroad.

3.1.3 Projected weighted populations

Weighted populations are calculated for 2022/23 based on the average registered population November 2021 to October 2022 and for each year 2023/24 and 2024/25 using the projected ICB registered populations for each year.

Each ICB's share of England weighted population will change over the period from 2022/23 to 2024/25 to reflect the changes in age-sex population projections across the country over that time.

3.1.4 Unregistered populations

Using registered lists does not take direct account of people who are not registered with a GP practice. ACRA has previously considered whether an adjustment should be made to the formula for unregistered populations, but the absence of reliable data on the size of the unregistered population by area and their healthcare needs, means they have not recommended an adjustment.

[7] ONS 2018 based Subnational Population Projections (SNPP) for LADs

A - Registrations by GP practice and ICB – 2022/23 (Excel file)

This gives the average number of registrations in November 2021 to October 2022 by GP practice and ICB, broken down by age-sex group.

Calculation of ICB estimated registrations 2023/24 and 2024/25 (Excel file)

This shows the projected registered populations for 2023/24 and 2024/25 by ICB and their population growth rates.

4 Integrated Care Board core allocations

4.1 Introduction

There are three steps in calculating weighted populations for target allocations for ICB core responsibilities. The first is to weight, or adjust, registered populations for relative need, the second is to weight for unmet need/health inequalities, and the third is to weight for unavoidable differences in costs.

This section covers the first and second, the weights per head for need and the health inequalities and unmet need adjustment. There are separate weights per head for need for general and acute, mental health, community and maternity services, as well as prescribing, as the distribution of each need component is different across the country.

Section 3 has described the population base, section 5 describes the adjustments for unavoidable costs, and section 6 describes how the need-weighted populations for general and acute, community mental health, maternity, and prescribing are combined into a single need-weighted population. Section 6 also describes how the need-weighted populations are combined with the unmet need adjustment and the adjustments for unavoidable costs to give a single unified weighted population for each ICB for its core allocations.

The basic approach in calculating need-weighted populations for ICBs is to multiply the population for each age-sex group for each GP practice by the relative need per head estimated from research. The products for each age-sex 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 ICB.

4.2 General and acute

4.2.1 The development of the model

Since the 2014/15 allocations ACRA has recommended that relative need per head for general and acute services is estimated using a person-based approach, first developed by the Nuffield Trust[8]. The person-based approach uses anonymised data at the individual level to provide accurate estimates of need for small and atypical populations.

The model was refreshed for the 2022/23 allocations round as part of ACRA's development programme. The same approach and methodology were followed as previously. The new formula used more recent data and some additions and changes to the model specification. A paper detailing the development of the new model is available on the allocations website.[9] For the 2023/24 allocations the model is unchanged and the needs weights derived for 2022/23 allocations have been applied to the updated population estimates.

4.2.2 Services covered

The general and acute model covers inpatient spells in hospital and community settings, outpatient attendances, accident and emergency attendances and critical care. Mental health, community (non-inpatient) and maternity services were excluded as they are covered by separate component models. Specialised services were also excluded as they are currently subject to different commissioning arrangements.

4.2.3 Need estimated from past healthcare use

Relative need was estimated from past patterns of utilisation of health services. Costs per head in 2018/19 were calculated for each individual registered with a GP practice in April 2018, by applying a cost to each inpatient spell, outpatient attendance, A&E attendance and critical care day. The costs used were National Tariff prices if available, and otherwise reference costs. In a small minority of cases, the specialty average was used in the absence of tariff prices and reference costs.

Statistical modelling was used to select the 'best fit' drivers of relative costs at the person level and the relative weights for each driver. The quantified relationships found were taken to be predictors of relative future, cost-weighted need for health care services, with the exception of the supply variables.

The modelling tested a wide range of potential variables to select those that were the best in statistical terms, and also plausible indicators of need, to be included in the final model. Morbidity (previous diagnoses) and age were the most important variables in the model.

4.2.4 Explanatory variables

An extensive set of explanatory variables were gathered for testing in the model. The starting point for this list were the variables tested in previous iterations of the general and acute model. The need variables tested in the model are summarised in Table 2.

---

[8] See Bardsley M and Dixon J (2011) Person-based Resource Allocation: New approaches to estimating commissioning budgets for GP practices. Research summary. Nuffield Trust.

[9] https://www.england.nhs.uk/allocations/

Table 2: Need variables

Explanatory variable	Description	Change since last update
Morbidity flags, co-morbidity flags and number of diagnoses	Historical diagnosis data were collated for all inpatient episodes and spells in 2016/17 and 2017/18 from the SUS+ dataset for the April 2018 cohort of GP registered patients. SUS+ is the Secondary Uses Service dataset that contains patient level data for hospital activity. These diagnoses data are used to create morbidity flags, indicating a past diagnosis of a condition in one of the World Health Organization defined sub-chapter of the International Classification of Diseases (ICD). The use of two years of historical diagnosis data is consistent with both the Nuffield PBRA 2011 model and the 2016/17 update. This reflects the diminishing explanatory power of historical data on future hospital costs with time. Additional co-morbidity flags are also included that take account of how having two diagnoses can increase or decrease the relative need compared to the sum of having each diagnosis alone. These are based on the higher level ICD chapters.	Data taken from 2016/17 and 2017/18 SUS+ rather than 2011/12 and 2012/13.
Age, sex and area of residence	Age, sex and Lower Super Output Area of residence were taken from the GP registrations data Master Patient Index (MPI).	Data based on April 2018 rather than April 2013.
Ethnicity	Matched each individual's ethnic group using a range of patient level health datasets. This has identified the ethnic group for 61% of individuals. For the remaining population an area-based proportion is used. Ethnicity is now included at ethnic group (16 groups).	Previously ethnicity was included as an attributed area-based variable from the Census - the proportion of the population resident in the LSOA in each of four broad ethnic categories.
Privately funded care flag	A flag was created for anyone with any privately funded care episodes recorded in SUS+ in 2016/17 or 2017/18.	Data taken from 2016/17 and 2017/18 SUS+ rather than 2011/12 and 2012/13.
New registrations	A flag for whether someone was newly registered with their current GP, based on the previous 12 months. Modelling has consistently found that being newly registered with a GP was associated with higher need and therefore higher cost.	Based on registration in 2017/18 rather than 2012/13.
Variables from the ONS Census of Population	A range of variables relating to population characteristics from the 2011 census. Only available for small geographical areas (lower layer super output areas - LSOAs) rather than for individuals, so individuals are 'attributed' with the value for the LSOA in which they reside.	No change
Index of Multiple Deprivation	The underlying indicators from the Index of Multiple Deprivation (IMD). Only available for small geographical areas (lower layer super output areas - LSOAs) rather than for individuals, so individuals are 'attributed' with the value for the LSOA in which they reside.	Updated for IMD2019 Use underlying indicators rather than composite scores

Explanatory variable	Description	Change since last update
Log population variance	Log of the variance between registered and resident populations for each LSOA. To account for possible list inflation	Updated to 2018 populations
Variables from the Department of Work and Pensions	Eligibility for Disability Living Allowance (DLA) or Personal Independence Payment (PIP)	New variable
Quality Outcomes Framework prevalence data	Prevalence data from the Quality Outcomes Framework (QOF) were also tested as need variables. Individual flags are not available and so individuals are 'attributed' with the value for the practice they are registered with.	Updated from 2012/13 to 2018/19.
GP survey	A range of indicators from the GP survey. Individual flags are not available and so individuals are 'attributed' with the value for the practice they are registered with.	Updated to 2018
New need variables tested in this round		
Household composition	Linking the MPI to the anonymised Unique Property Reference Number (UPRN) allows us to identify all individuals resident in a property and derive a household type variable that indicates the composition of the household as: • care home • other communal establishment • two adults and one or more children • multi-adult and one or more children • two adults of the same gender • two adults of different gender • one adult and one or more children; or • single person.	
Morbidity counts	As well as the morbidity flags and a variable constructed for the number of different diagnosis recorded for an individual, an additional morbidity count variable was constructed for testing in the model. A morbidity count variable was constructed which indicated where an individual had had a particular diagnosis recorded three of more times during 2016/17 and 2017/18. This was based on the hypothesis that having a diagnosis recorded more frequently indicates a higher level of need. The count of diagnoses recording was capped at three or more to avoid including access effects in the model.	

4.2.5 Supply variables

The utilisation of health care may also be affected by the relative availability of healthcare services. Variables were tested in the modelling to adjust for this, known as supply variables. The supply variables tested in the model are summarised in Table 3. 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 longer distance, this is corrected for in the formula.

Table 3: Supply variables

Explanatory variable	Description	Change since last update
Travel duration to hospital sites	Gravity weighted travel duration for an LSOA to all hospital sites	Updated list of hospital sites and travel duration calculations
CCG dummy	A flag for each individual indicating which CCG is responsible for commissioning their healthcare – based on the GP practice at which they are registered	Configuration of CCGs in 2018/19 rather than in 2013/14.
Quality Outcomes Framework (QOF) scores and exception rates	Weighted scores and exception rates from the QOF were also tested as supply variables. Individual flags are not available and so individuals are 'attributed' with the value for the practice they are registered with.	Updated from 2012/13 to 2018/19.
Hospital supply variables	A range of gravity weighted variables for each LSOA, including median waiting times, diagnostics and numbers of beds/operating theatres.	Updated from 2012/13 to 2018/19.
GP workforce survey	A range of variables relating to GP workforce. Individual flags are not available and so individuals are 'attributed' with the value for the practice they are registered with.	Updated to 2018

4.2.6 Implementing the model

The formula refresh modelled cost weighted need in 2018/19 for those registered with a GP practice in April 2018 using values of the explanatory variables in 2016/17 and 2017/18.

In previous allocations rounds, where a GP practice has opened or been newly formed since the modelling was undertaken, the average need per head by age-sex group for the relevant CCG was used. As ICBs are now such large areas, the average need per head by age-sex group has been calculated for local authority districts (LADs). This allows for more variation in need within ICBs to be accounted for.

The data used for the modelling does not include treatments received in hospitals in Wales by those registered with an England GP practice. NHS Wales Information Services has previously provided counts of activity data for those registered with a GP practice in each of NHS Shropshire CCG, NHS Herefordshire CCG, NHS West Cheshire CCG and NHS

Gloucestershire CCG. The need index is adjusted for ICBs that include these CCGs to account for patients treated in Wales.

B – General and Acute need per head 2023/24 and 2024/25 (Excel file)

This shows the need per head for each age-sex group for each GP practice. It also shows where the LAD average need per head by age-sex group was used for new practices.

The file also shows each GP practice and ICB's registrations weighted for need for general and acute services.

4.3 Community Services

4.3.1 Background

In the 2019/20 allocations round a model for community services was used for the first time. Previously it was assumed that need for community services was in line with need for general and acute services. The same model was used for the 2022/23 allocations.

As there was no national dataset available at the time, the community services model was based on analysis of local datasets from a diverse group of CCGs. This allowed us to develop a community services component, which is significantly different from the general and acute component.

For the purposes of ICB allocations, community services are ICB funded health services that take place outside of a hospital setting and are not part of the primary medical care portfolio. Community mental health services are excluded here as they are included in the mental health formula. Community services funded by local authorities, such as health visiting and school nursing, are also out of scope.

Community services cover a wide range of service types and different ICBs will offer different sets of services depending on the make-up of their populations and on historical factors affecting service provision in their area. The most common forms of service are district nursing or long-term condition management, intermediate care, podiatry and children's services. Other services include physiotherapy and speech and language therapy.

The development of the model was based on analysis of contact with district nursing, because:

- it represents a large part of the spend on community health services (18%)
- it is applied universally across England
- it has an age profile which rises steeply with age for recipients in their 70s and 80s which is significantly different to the profile for general and acute services.

The community services model has not been updated for 2023/24 allocations. Although the community services dataset is now more mature, the data are not yet consistent across all providers for a long enough period of time to build an alternative model for community services.

A travel time adjustment has been added to the community service model for 2023/24 allocations in recognition that sparsely populated areas will have higher costs of delivering

community services delivered in peoples' homes due to longer travel times between appointments.

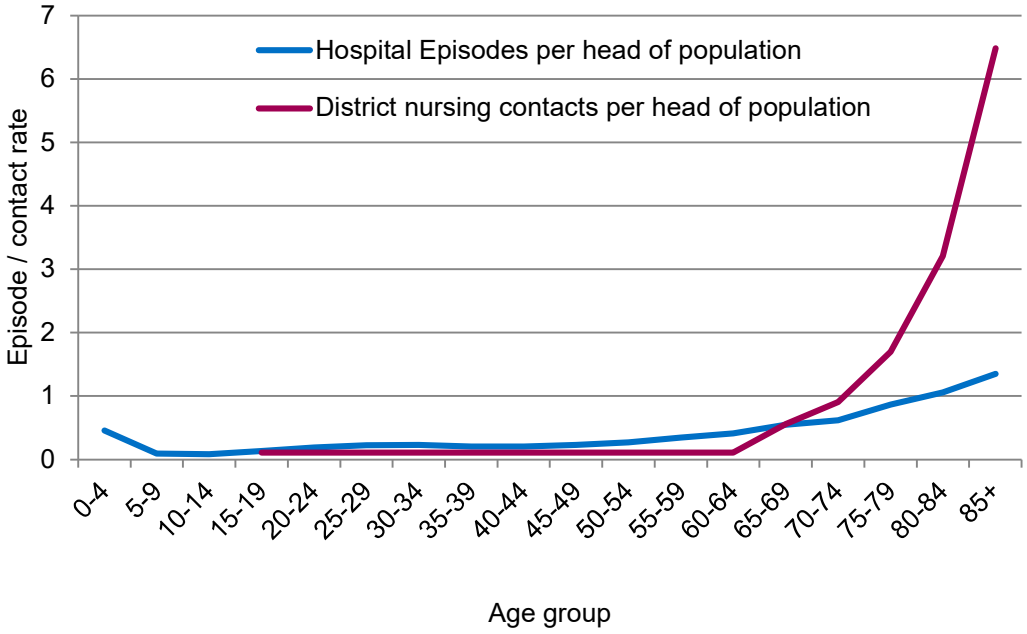
4.3.2 Approach

The development of the model for the community services component was based on analysis of district nursing data for five CCGs in Kent for 2016/17 and three CCGs in the West Midlands each with part-year activity in at least one of three years (2015/16 to 2017/18). The model was validated using data from Leeds. Further details can be found within the Community Services research paper.[10]

Programme budgeting showed that the two sets of CCGs are a reasonable sample of middle-ranking CCGs for district nursing spend, so would produce a reliable starting point for the equitable distribution of relevant funding.

Utilisation of district nursing rises as recipients get into their 70s and 80s and suggests a quite different age-cost curve to the one for general and acute services as shown in Figure 2, justifying the requirement for a separate component for community services to reflect this.

Figure 2: Comparison of age-cost curves for General Acute and Community Services



Our analysis showed that half of all community service activity (weighted by expenditure) varies by age in a similar way to district nursing. The community services component of the core CCG formula was therefore used to distribute 50% of the community services budget with the remaining 50% continuing to be distributed in-line with the general and acute component of the formula.

4.3.3 Model

Analysis was undertaken to attempt to estimate a workload model for district nursing, details of which can be found in the Community Services research paper. Due to restrictions in the data available it was concluded that estimating a workload model would

[10] Community services formula for 2019/20 to 23/24 revenue allocations

add little value and greater uncertainty over and above an activity model, so we developed an activity model using contact rate, based on a combination of the Kent and West Midlands data.

Analysis showed that age was the most important factor in determining need for community health services, but within each age band there was also a notable deprivation slope that means that, controlling for age, patients in more deprived areas receive more district nursing contacts than those in less deprived areas. Our approach is therefore based on a regression model taking account of age, sex and deprivation.

4.3.4 Implementing the model

Contact rates by age and sex are calculated for GP practices and ICBs based on applying the contact rates from the model to the registered populations by age, sex and deprivation decile. These contact rates are then applied to the registered populations for those cohorts to produce a weighted population.

4.3.5 Travel time adjustment

A new travel time adjustment for the community services formula has been introduced for the 2023/24 allocations round. This recognises the additional travel times necessary to deliver district nursing contacts at patients' homes in sparsely populated areas.

A travelling salesman approach has been used to model the relative travel time required by district nurses to deliver home visits in different parts of England taking account of different rates of visit by age, gender, deprivation and time of day, as well as the distribution of likely user populations across the country.

Tables 4 and 5 show the rate of visits per 1,000 population per day (261 weekdays and 104 weekend day) by age/gender and IMD decile based on data from Kent. The rate amongst those age 65+ is substantially higher than other ages (15-20 x other adults, for example) and rates are higher in more deprived areas.

Table 4: Rate of visits per 1,000 population per day by age/gender

Gender	Age	Weekday - day	Weekday - evening	Weekday - night	Weekend
Male	0-18	0.002	0.001	0.000	0.002
Male	19-64	0.327	0.044	0.060	0.299
Male	65+	4.938	0.505	0.891	3.063
Female	0-18	0.002	0.000	0.000	0.005
Female	19-64	0.317	0.032	0.048	0.254
Female	65+	6.231	0.516	1.008	3.418

Table 5: Rate of visits per 1,000 population per day by IMD decile (1 = most deprived, 10 = least deprived)

IMD decile	Weekday - day	Weekday - evening	Weekday - night	Weekend
1	1.707	0.150	0.301	1.184
2	1.479	0.209	0.263	1.082
3	1.551	0.172	0.291	1.007
4	1.572	0.149	0.286	1.074
5	1.500	0.151	0.310	1.025
6	1.290	0.098	0.202	0.751
7	1.440	0.127	0.188	0.761
8	1.224	0.108	0.186	0.676
9	1.284	0.152	0.228	0.779
10	1.065	0.044	0.159	0.509

The adjustment shows associations that we would expect:

- More visits per km^2 → reduced average travel time
- More built-up area → increased average travel time (except weekends)
- More road per km^2 → increased average travel time (except weekends)
- Great proportion / higher flats → increased average travel time (except weekends).

The regression gives a good overall fit to the data.

Implementing the travel time adjustment

Travel times from the modelling were aggregated to ICB level and combined with average visit times to calculate an overall total time. An ICB total time index was calculated by dividing each ICB's total time by the weighted average total time for England.

A travel time adjustment weighted population was calculated by multiplying each ICB's total time index with their community services weighted population and renormalising. This was combined with the community services weighted population and given a weighting of 59.4%, being the percentage of community expenditure on delivering services in a patient's home. This was derived from the Kent data.

Further work to refine the adjustment will be undertaken as part of the ACRA work programme in a future round of allocations.

C – Community Services 2023/24 and 2024/25 (Excel file)

This shows contact rate by age and sex for GP practices and ICBs.The file shows also each GP practice's and ICB's registrations weighted for need.

4.4 Mental health

4.4.1 Approach

The mental health model has not been updated for the 2023/24 allocations round.

The adult mental health component was refreshed for the 2019/20 allocations round to use person-level data on the use of mental health services, learning disability services, Improving Access to Psychological Therapies (IAPT) services, and general and acute hospital services, as well as demographic characteristics and area level socio-economic characteristics. Specialised mental health services, which are commissioned by NHS England, were excluded from the model whenever data would allow.

The refreshed model was based on more up-to-date data than the previous model and also included IAPT services and updated categories for unit cost breakdowns. Further detail on the development of the model can be found in the Mental Health model research paper[11].

4.4.2 Data

The model is based on national datasets for 2015/16 that capture person-level service usage in a consistent and comparable way. The two main datasets used were the Mental Health Services Data Set (MHSDS[12]) and the IAPT dataset. Information on inpatient and outpatient care were complemented with Secondary Uses Survey (SUS) data when not reported in the MHSDS. Individual cost-weighted activity estimates were calculated by aggregating the cost for inpatient bed days (split by the cost per general bed day and cost per intensive bed day) and unit costs for community care contacts (split by the pay band of the care professional overseeing the care) and IAPT contacts.

These data were merged with other person and area level information relative to 2013/14 and 2014/15 derived from other routinely collected data available within NHS England for all individuals registered with a GP practice in England at 1st of April 2015.

4.4.3 Explanatory need and supply variables

The model included a set of explanatory variables that were found to be associated with the future use of mental health care, including both need and supply variables.

Key indicators of need that were included are:

- **Individual level indicators** of age, gender and ethnicity, and of physical health diagnostic flags (from inpatient diagnoses, relating to issues such as substance misuse and conditions such as diabetes[13]).
- **Household level indicators** on household composition to inform key drivers discussed in the literature such as living alone[14].

---

[11] Mental health allocations formula for 2019/20 to 2023/24 revenue allocations

[12] Formerly the Mental Health and Learning Disabilities Services Data Set and the Mental Health Minimum Dataset

[13] As identified in work published by Public Health England on links between physical health and severe mental illness https://www.gov.uk/government/publications/severe-mental-illness-smi-physical-health-inequalities

[14] The mental health costs for individuals living alone were found to be higher than individuals who did not, further details are outlined in the Technical report for the Mental Health Allocation Formula.

- **Small area level indicators** where individual and household level data are not available, in particular the proportion of people in receipt of benefits, indicating levels of worklessness.
- **General Practice (GP) indicators** on the proportion of students on the GP list and the Quality and Outcomes Framework measures covering the prevalence of severe mental illness.

A set of supply variables are also been included to account for differences in supply side issues. The variables included are:

- A set of variables indicating the CCG of the GP practice where the individual is registered, to account for differing levels of access and commissioning approaches to mental health services.
- A variable indicating the degree of service use for each GP practice at each mental health trust, to control for the supply of mental health services by taking account of the effect that differing provider approaches to provision, classification, coding and reporting of treatment, may have on individual cost.
- Average driving distance between the LSOA centroid (of patient residence) and the closest provider (mental health trust headquarters), as living closer to a provider is associated with higher access to and utilisation of services. Sterilising this variable in the formula is important so that rural areas are not under-allocated resources.

4.4.4 Need estimates

Individual need estimates were derived by taking predictions from the model but sterilising the effect of supply variables and variables that were counterintuitive. Variables were sterilised by fixing values to reflect England averages, to predict need. Individual need estimates were aggregated to the patient age and gender levels and used to weight GP registered populations.

4.4.5 Children's and young people's (CYP) mental health adjustment

The refresh of the adult model concentrated on those aged 20 and over, so an alternative method was used to estimate mental health need per head for the four quinary age bands under 20. The adult model is person-based but person-based CYP data has not yet been available for long enough in the MHSDS to extend the model to this age group. The adjustment for CYP therefore followed a similar approach to that taken in previous allocations rounds.

The method used all mental health activity captured as inpatient bed days and outpatient appointments within the Mental Health Services Data Set (MHSDS) for 2017/18.

Cost-weighted activity estimates were calculated by quinary age groups and across these age groups by gender. The unit costs used for bed days and appointments were taken as estimated for the adult model. 9% of all the cost-weighted activity within the MHSDS was for CYP and the remaining 91% captured services delivered to adults, however, it should be noted that this activity excludes adult IAPT contacts.

The CYP cost-weighted activity estimates were then expressed as a percentage of cost-weighted activity for the 20-24 age groups, split by gender.

The percentage of cost-weighted activity by gender and for the four children and young person's age groups were then applied to the need per head from the refreshed adult mental health model by gender for those aged 20-24. These ratios were validated against data extracts from Hospital Episode Statistics (HES).

D – Mental Health need per head 2023/24 and 2024/25 (Excel file)

This shows the need per head for each age-sex group for each GP practice and ICB calculated using the refreshed mental health model and estimates for those aged under 20 as described above.

The file also shows the weighted populations for mental health and mental health relative need index for each GP practice and ICB.

4.5 Maternity

4.5.1 Approach

The maternity model was last refreshed for 2016/17 allocations by NHS England. The model used person-based data to estimate cost per birth by GP practice in 2013/14. For the 2023/24 allocations round, the model is unchanged and the need weights derived for 2016/17 allocations were applied to updated birth estimates.

4.5.2 Model

The same data set was used as for the refresh of the 2016/17 general and acute model. This included diagnoses in previous years and a wide range of data including from the ONS Census of Population.

A number of new variables were created for the refresh of the maternity component, including the proportion of births that were low birth weight births and the number of births by the mother in the period 2010/11 to 2013/14.

A smaller set of variables were tested for inclusion in the model than for general and acute, based on the plausibility of relevance for maternity services. For example, the proportion of those aged over 65 in the small area claiming state benefits was not tested.

Age and some morbidity markers (previous diagnoses) were found to be important determinants of predicted costs per birth. Supply variables were included in the model but set to the national average in the calculation of weighted populations.

4.5.3 Implementing the model

For the 2023/24 allocations round, ONS statistics on live births by age of mother in 2021 were used to weight female registered patients aged 15 to 44 by quinary age bands within LSOAs, to distribute live births in England by GP practices. The costs per birth were applied to the average annual number of live births between 2017 and 2021.

For practices that had opened since the end of 2013/14 (and for which there is not a cost per birth available from the model), the average cost per birth for the LAD in which the GP practice is located was used.

E – Maternity need 2023/24 and 2024/25 (Excel file)

This shows the number of new registrations for births, the estimated cost per birth, and the variables in the maternity model and their coefficients

The file also shows each GP practice and ICB's registrations weighted for maternity need.

4.6 Prescribing

4.6.1 Approach

The prescribing component covers the costs of medicines prescribed in primary care and actually dispensed. It does not cover the costs of dispensing the prescriptions as these are not funded by ICBs.

The model has two stages; the first weights for need related to age and sex, and the second stage weights for additional need over and above that related to age and sex. The unit for analysis in the models is GP practices.

The model was last refreshed by NHS England for 2016/17 allocations and is based on the cost of prescriptions by GP practice in 2013/14. For the 2023/24 allocations round the model is unchanged and the need weights derived for 2016/17 allocations were applied to updated population estimates.

4.6.2 Weights for age and sex

The adjustment for age and sex applies the weights that were developed by NHS Digital known as ASTRO(13)-PUs.[15] This is an index of the national average costs of prescriptions by age-sex group.

4.6.3 Weights for additional need

The model for additional need includes both need and supply variables as for the other components. The set of variables in the model were determined by statistical goodness of fit and plausibility as indicators of need. The need variables in the final model include for example the Index of Multiple Deprivation and the proportion of those aged 70 years and over claiming disability living allowance (DLA).

4.6.4 Implementing the model

ASTRO(13)-PUs and additional need estimates were applied to each GP practice and the GP practice weighted populations summed to give the ICB weighted populations. Supply variables were included in the model but set to the national average in the calculation of weighted populations.

Where a GP practice has been newly opened or formed, the average additional need values for the relevant LAD for these GP practices has been applied.

[15] https://webarchive.nationalarchives.gov.uk/20180307182940/http://content.digital.nhs.uk/prescribing/measures

F – Prescribing need 2023/24 and 2024/25 (Excel file)

This shows the calculation of registrations weighted for age, sex and additional need for each GP practice and ICB. It shows also where the additional need variables were not available from the model for new practices, and the average LAD value was used.

The file also lists the coefficients and variables in the model.

4.7 Adjustment for rapidly growing practices

4.7.1 Approach

Where GP practices are growing rapidly in size, the cost weights calculated for some of the component models may no longer be representative of those practices. Analysis of registration trends has been undertaken that has identified two practices, both from the Babylon GP at Hand (GPAH) group, that have grown significantly in recent years and have a different age profile to the original practice or practices in their local area and should therefore be subject to adjustments.

4.7.2 Implementation

There are two Babylon GP at Hand (GPAH) digital first practices, one in North West London and one in Birmingham. As these practices were not in existence when the majority of the models were developed and because they have a registered population that is geographically dispersed it is necessary to calculate cost weights for these practices that take account of the different need profiles of the areas from which they draw patients.

As ICBs are now so large, the registered population of the GPAH practices has been mapped to LADs. The cost weights for each GPAH practice have been calculated by applying the LAD average cost weight to the population resident in that LAD, where the LAD has more than 2% of the GPAH registered population. This is three LADs for the Birmingham GPAH practice and 18 LADs for the London practice. As the London practice was in existence when the general and acute model was developed the average cost weights from the model will be used for this practice.

4.7.3 Maternity adjustment

A comparison of the birth rates between patients registered with GPAH and patients registered with other GP practices for the LADs with more than 2% of the GPAH registered population has been made. The ratio of the birth rate for GPAH patients compared to patients with other GP practices is 0.37. This figure will be used to adjust the maternity need for the North West London GPAH practice.

There have been very few births for patients registered with the Birmingham GPAH practice and therefore there are insufficient data to calculate an adjustment. No adjustment is applied for this practice.

4.8 Unmet need and health inequalities adjustment: avoidable mortality

4.8.1 Approach

Given the use of utilisation-based formulae in our allocations approach, ACRA recognises the importance of attempting to account for health needs which are not visible in the utilisation statistics. We also have a duty to use an approach that contributes to reducing avoidable health inequalities. As such, a significant proportion of target allocations is devoted to a combined unmet need/health inequalities adjustment.

As part of the NHS Long Term Plan, ACRA was commissioned to undertake a review of the health inequalities and unmet need adjustment used in resource allocations. The review considered alternative measures to the standardised mortality ratio for those aged under 75 years (SMR<75) and concluded that a measure of avoidable mortality was a better option. It is a better fit to the definition of health inequalities, as the causes of death included in the measure have been identified as those that could have been avoided through public health measures and/or timely and effective health care intervention.

Different definitions of avoidable mortality were considered, varying the age cut-off from including all avoidable mortality under 75, to including avoidable mortality among all ages, to using a bespoke definition that uses the 75 years age cut-off but includes all age mortality for specific causes of death. The bespoke definition was considered the most appropriate as it captures some avoidable mortality for age groups over 75, while avoiding some of the concerns with applying avoidable mortality to all age groups. More detail can be found in ACRA's review on the NHS allocations website.[16]

As in previous allocation rounds, ACRA have not been able to make an evidence based recommendation on how much funding should be redistributed through the unmet need adjustment. For 2023/24 the share for primary medical care and specialised services allocations will remain at 15% and 5% respectively. As described in Section 2.3.13 the weighting of the health inequalities and unmet need adjustment for ICB core services has been increased from 10% to 10.2%.

4.8.2 Avoidable mortality

The unmet need/health inequalities adjustment is based on the indirectly standardised bespoke measure of avoidable mortality applied at small area level to take account of inequality in health outcomes within as well as between ICBs.

The standard indicator of avoidable mortality is measured by counting the number of registered deaths (aged <75 years) from a list of diseases classed as preventable and treatable agreed between OECD nations using ICD-10 definitions. Preventable deaths are defined as deaths from causes that could be avoided through public health measures (eg influenza). Treatable deaths are defined as deaths from causes that could be avoided through timely and effective healthcare interventions (eg appendicitis). For the purposes of the review, ONS produced a bespoke measure of avoidable mortality that include certain

[16] https://www.england.nhs.uk/allocations/

causes of death for over 75s. Indirect standardisation is applied at small area level (middle layer super output area (MSOA[17])) and then aggregated to ICBs.

4.8.3 Weights per head

The adjustment has been calculated using data for avoidable mortality (2016-20).

The methodology for weighting applied to each MSOA is unchanged from that introduced for weighting the SMR<75 values for 2019/20 allocations.

In 2019/20, on the recommendation of ACRA, we revised our approach to the weighting we apply to each MSOA. Previously each MSOA was assigned to one of sixteen groups based on its SMR<75 value.

Now instead we apply a continuous exponential distribution based on avoidable mortality values, calibrated to the previous approach.

4.8.4 Implementation

Each MSOA's population is given a weight based on this methodology and the MSOA weighted populations are then summed to ICB level using the number of the ICB's registered population resident in each MSOA.

G – Avoidable mortality weighted populations 2023/24 and 2024/25 (Excel file)

This shows the weights per head for each of the 6,791 MSOAs in England, and the calculation of avoidable mortality based weighted populations for ICBs.

5 Unavoidable costs

5.1 Introduction

There are adjustments for four types of unavoidable costs: the market forces factor (MFF); the emergency ambulance cost adjustment (EACA); remoteness; and the private finance initiative (PFI).

The adjustments are included in the weighted capitation formula to take account of the higher costs of commissioning services as a result of these unavoidable factors.

[17] MSOAs are small geographical areas designed by ONS for statistical reporting and analysis and MSOAs have similar population sizes.

5.2 Market forces factor (MFF)

5.2.1 Approach

The MFF adjusts for the unavoidable differences in unit input costs between areas due to their geographical 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 provider MFF was updated in 2022/23, incorporating more up-to-date data to improve the accuracy of the estimates of unavoidable cost difference between providers. The previous MFF values were produced in 2019/20.

The provider MFF consists of 6 components, which are; non-medical and dental staff; medical and dental staff; land; buildings; business rates; and other.

MFF is applied at LAD level to allow for variations in unavoidable costs within ICBs to be accounted for.

5.2.2 MFF index for LADs

The MFF for each provider is the starting point for the calculation of MFFs for LADs. The MFF for each LAD is calculated from the MFFs of providers where patients received inpatient, outpatient and A&E treatment for each GP practice located in the LAD.

The LAD's MFF is the weighted average of providers' MFFs, where the weights are the spend in the LAD with each provider. The weights are often known as the purchaser-provider matrix.

The purchaser-provider matrix for 2023/24 allocations uses activity for the 12 months up to February 2020 (to avoid any impact of the Covid pandemic on patterns of activity) as recorded in the Secondary Uses Service Payment by Results (SUS PbR) data). The LAD MFFs are expressed as an index, with the England average set to the value of 1.0.

For each GP practice, the LAD MFF index for the LAD in which the practice is located is applied to the GP weighted populations for general and acute, community, mental health and maternity services. These are then combined to create a combined weighted population adjusted for MFF.

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

A separate LAD MFF is calculated for specialised services, reflecting that the purchaser provider matrix will be different for specialised services.

H – Market forces factor (Excel file)

This shows the percentage of each LAD's costed inpatient, outpatient and A&E activity with each provider, along with the 2023/24 and 2024/25 LAD MFFs, plus the scaling to rebase LAD MFFs to an index so that the England average equals 1.0. This is shown for both core services and specialised MFF.

5.3 Emergency ambulance cost adjustment

5.3.1 Approach

The emergency ambulance cost adjustment (EACA) adjusts for unavoidable variations in the costs of providing emergency ambulance services in different geographical areas, and in particular sparsely populated areas. The EACA was refreshed by NHS England for the 2016/17 allocations round. The same model was used in 2019/20 and 2022/23, the model is unchanged for 2023/24 allocations.

5.3.2 Model

Data on times to incidents, times at incidents, times to convey to hospitals, and turnaround times at hospitals from four ambulance trusts (North East, South West, London and East Midlands) were used to develop separate models for times to 'see & treat' and 'see & convey'. See & convey is where the patient is taken to a hospital in the emergency vehicle, and see & treat is where the patient is treated at the scene (such as in the patient's home) and is not transported to hospital.

Data were provided at MSOA (middle super output area) level to maintain patient confidentiality. Data from other sources on the characteristics of MSOAs were collected by NHS England, including population density, distance to A&E departments, and age profiles.

Distance to A&E departments and population density were found to be important in the models.

The two models for see & treat and see & convey were combined to give average predicted times in minutes using the proportions of see & treat and see & convey cases in the dataset.

5.3.3 Implementation

The modelled times in minutes for MSOAs were summed to ICB level. The modelled times for ICBs were converted into an index, with the England average set to the value of 1.0.

The index from the previous step was applied to the proportion of national Hospital and Community Health Services (HCHS) expenditure on ambulance services, to give the final overall EACA index. The same EACA index value is applied to the combined weighted populations for general and acute, mental health, community and maternity services.

I – Emergency ambulance cost adjustment (Excel file)

This shows the EACA index as calculated from the coefficients from the models.

5.4 Unavoidable costs of remoteness

5.4.1 Approach

The purpose of this adjustment is to target funding at ICBs to meet the unavoidably higher costs of remote hospital sites, where the costs are higher because the level of activity is too low for the hospital to operate at full efficiency.

There are two steps in calculating the adjustment. The first is to define remote hospital sites, and the second is to estimate by how much their costs are unavoidably higher. This adjustment was introduced in 2016/17 allocations. An updated econometric analysis of the

unavoidable costs of being a small provider was produced for the 2022/23 allocations round. The same adjustments, uplifted for tariff inflation, are used for 2023/24 allocations.

5.4.2 Identifying remote hospitals

The remoteness adjustment applies to hospitals providing Tier 1 A&E services. The criteria used to define remote hospitals are as follows:

i) There is a population of under 200,000 within a one-hour travel time of the site. A population served of 200,000 or more is the scale at which a hospital is taken as being able to achieve close to national efficiency levels. This is to avoid an adjustment being applied to larger remote hospitals for which costs should not be unavoidably high.

ii) The next nearest provider (with tier 1 A&E services) is one hour or more away by normal road travel times (including ferry times where relevant), for at least 10% of the population served. One hour is taken to be the maximum travel time to hospitals for clinical safety reasons for emergency care. The proportion of the population served who are more than 60 minutes away from the next nearest hospital provides an indication of whether the hospital is serving a population of under 200,000 for reasons of remoteness or for other reasons. An adjustment to target allocations is only made when this percentage is 10% or higher. This avoids giving very small (immaterial) adjustments to a large number of providers.

Travel times were used rather than road distances or straight-line distances. Travel time to the next nearest hospital is an indicator of whether or not consolidation of services onto fewer sites is feasible.

The criteria identified eight hospital sites as unavoidably small due to remoteness. The list of hospitals subject to the remoteness adjustment remains unchanged for 2023/24 allocations.

5.4.3 Higher costs due to smallness

To calculate the adjustment introduced in 2016/17, a cost curve was estimated for all hospitals, which gave the estimated cost of sites by activity levels. The estimated relative costs were adjusted to remove the impact of differences in case mix and in costs that are already compensated through the market forces factor (that is unavoidable differences in unit input costs across the country).

Estimated costs for predicted activity for a hospital serving a population of 250,000 people, around the national average, were used as the reference point for estimating the scale of higher costs at remote sites. The cost curve gave the estimated higher costs above the reference point for each of the hospitals with predicted activity levels that correspond to the size of their population catchment area.

The adjustment reflected the expected higher costs based on the cost-curve, rather than the actual costs of the hospital, which may be affected by other factors unrelated to its scale. Predicted activity for a given population catchment area was used for the remote hospitals instead of actual activity, as the latter may be affected by other factors such as patient choice.

The updated method for calculating the adjustment takes a different approach and has exploited the newly available Patient Level Information and Costing (PLICS) data. The PLICS data support a better understanding of costs by providing costing of activity at an individual level, allowing for variation in costing between patients. The previous model used

reference costs which provide average cost for each type of activity at each provider. An econometric model was used to identify the drivers of costs and made use of variables not previously available.

The key finding from the new econometric modelling was that the most important factor in determining economies scale is not the size of the site, but the size of the department. As smaller hospitals tend to have fewer departments that are larger relative to their size, the econometric model indicates that the costs of being a small hospital have previously been overestimated. However, there may be factors other than size that impact on the costs of providing services in small hospitals in remote locations and further work is underway to explore this. To ensure that no ICB is disadvantaged while further work is completed the adjustment applied for each hospital will be the higher value from either the pre-existing adjustment or the new adjustment.

5.4.4 Implementation

The total adjustment was £39 million covering seven ICBs for the eight hospital sites. The adjustment for the baseline year of 2022/23 was calculated by adjusting the 2018/19 figure by uplifting by an amount equivalent to the tariff inflation over that time period. These are shown in Table 6. How the adjustments for higher costs due to unavoidable smallness were included in weighted populations for ICBs is described in Section 6.

Table 6 Adjustment for unavoidable smallness: adjustment by site

Hospital	Adjustment 2023/24 £000s	ICB
Furness (University Hospitals of Morecambe Bay)	£7,167	NHS Lancashire and South Cumbria ICB
West Cumberland (North Cumbria)	£6,379	North East and North Cumbria ICB
St Mary's (Isle of Wight)	£6,061	Hampshire and the Isle of Wight ICB
North Devon (Northern Devon)	£4,547	Devon ICB
Cumberland	£4,105	North East and North Cumbria ICB
Hereford (Wye Valley)	£3,897	Herefordshire and Worcestershire ICB
Pilgrim (United Lincolnshire)	£3,445	Lincolnshire ICB
Scarborough (York Teaching)	£3,781	Humber and North Yorkshire ICB

5.5 Excess finance costs of the private finance initiative (PFI)

5.5.1 Approach

The purpose of this adjustment is to reflect the impact of excess finance costs that some trusts face due to the financing arrangements for some buildings constructed under historic PFI arrangements. This adjustment was introduced for the 2022/23 allocations round and remains unchanged for 2023/24 allocations. Several trusts with PFI obligations have previously been in receipt of direct payments based on historical analysis undertaken by DHSC in 2011. The new approach replaces these direct payments with a consistent methodology based on the excess finance costs some trusts pay in PFI contracts compared to other sources of public sector financing.

5.5.2 Calculation of costs

2020/21 trust account consolidation (TAC) data has been used to estimate the excess financing costs (defined as derived interest rate and contingent rent above 6.3%).

5.5.3 Implementation

The adjustment is implemented in the same way as the adjustment for unavoidable smallness as is described in section 6.

6 Total weighted populations for core ICB allocations

6.1 Combining the formula components

6.1.1 Unified weighted populations for November 2021 to October 2022 registrations

As described earlier, there are separate weighted populations for need for general and acute services, mental health services, community services, maternity services and prescribing, and additionally there are adjustments for unmet need/health inequalities and unavoidable costs.

These are combined into unified weighted populations for each ICB for core allocations in the following steps.

1. Apply the MFF index to GP practice weighted populations for general and acute, mental health, community and maternity services and aggregate to ICBs.
2. The hospital and community services (HCHS) need-weighted population is calculated by combining the weighted populations for need for general and acute, mental health, community and maternity services. This is done by weighting each component according to its modelled share of HCHS spending in 2024/25.
3. Apply the EACA index.
4. Combine the weighted populations for HCHS from steps 2 and 3 with the weighted populations for prescribing, weighting each element according to its modelled share of total spending in 2024/25. There is no adjustment for the MFF and EACA for prescribing.
5. Combine the outcome from step 4 with the unmet need/health inequalities adjustment. The latter is given a weight of 10.2% and the outcome from step 4 a weight of 89.8%.
6. Apply the adjustments for unavoidable costs due to remoteness and PFI.

6.1.2 Unified weighted populations for 2023/24 and 2024/25

Unified weighted populations for 2023/24 and 2024/25 are calculated by applying the component model outputs to projected populations which are calculated as described in Section 3.

J – Overall weighted populations for ICBs and GP practices 2023/24 and 2024/25 (Excel file)

This shows the overall weighted population for each ICB for core allocations for 2023/24 and 2024/25 based on projected populations, and the weighted populations for general and acute, community, mental health, maternity, prescribing and the health inequalities and unmet need adjustment.

The file also shows the overall weighted population for each GP practice for 2023/24 and 2024/25.

7 Primary medical care allocations

7.1 Introduction

The formula for primary medical care (GP services) allocations was updated in 2016/17.

The formula for 2023/24 allocations is unchanged.

7.2 Methodology

7.2.1 Data

The requirement was to measure general practice workload and consider how the attributes of practices and their patients influenced that workload. The dataset used was the Clinical Practice Research Datalink (CPRD), which is an ongoing primary care database of anonymised medical records for a large number of general practitioners. It is broadly representative of the UK general population in terms of age, sex and ethnicity. For this work there were usable records from around 210 practices covering about two million patients.

Workload was measured by the number of minutes electronic files for patients were open, weighted by staff group.

7.2.2 Modelling approach

A linear fixed effects model was fitted to the CPRD data to estimate the effect of patient and practice characteristics on GP workload. The model is at the person level, and of the form:

$$\text{Total file opening times (weighted by staff group)} = \text{Constant} + \text{Age-sex group} + \text{New registration} + \text{IMD decile} + \text{Practice ID}$$

Age and sex are well known to affect workload; typically more elderly patients have more minutes of GP practice time than younger age groups.

Index of Multiple Deprivation (IMD) is a proxy for higher need in more deprived areas. IMD 2010 data were used as these data were in the CPRD dataset at the time of data extraction. IMD values were imputed for the individual patients who did not have associated IMD deciles in the dataset provided.

Being newly registered with the practice was found to be associated with higher workload.

The intercept (constant) represents the estimated average number of additional weighted contact minutes per year that a patient on the registration list at the start of the year with baseline characteristics has with their GP surgery. In the model that is a male patient, aged 0-5, in IMD decile 1.

The practice ID was treated as a supply variable, and not included in the weighted populations. This removes the impact on workload of differences between individual GP practices in their working practices.

ACRA considered whether rurality should be included as a factor in determining workload but concluded that it should be excluded from the model. This was because of uncertainty over whether it was reflective of additional workload or systematic differences in behaviour in rural practices not arising from workload.

An adjustment is made to the formula to account for the additional costs for practices that are dispensing doctors.

More information on the model can be found in the paper *Primary medical care – new workload formula for allocations to CCG areas*.[18]

7.3 Implementation

The model's coefficients and constant term were applied to GP practice average registered lists for November 2021 to October 2022 and to projected practice populations for 2023/24 and 2024/25. The GP practice MFF from the Carr-Hill formula was also applied. This gave GP practice weighted populations which were then aggregated to ICBs.

An adjustment accounting for 15% of the overall primary medical care weighted population is applied to adjust for unmet need and health inequalities (see Section 4.7). An adjustment was also applied to account for estimated dispensing doctors' fees in 2021/22, uprated to 2022/23 values.

ICB weighted populations for 2023/24 and 2024/25 were derived using the projected GP registered population profiles as described in Section 3.

7.4 Pharmaceutical, ophthalmic and dental services (POD)

From 2023/24 all ICBs have delegated responsibility for the commissioning of pharmaceutical services, general ophthalmic services, dental services (primary, secondary and community) and other primary care services (collectively referred to as POD services). NHS England issued 2-year allocations for POD services as part of the 2023-25 ICB allocation schedules. The POD allocation schedule set out the baseline allocation, base growth and convergence adjustment (where allocations are above or below NHS Long Term Plan levels) for each ICB allocation. These allocations remain in place for and have been updated to reflect pay announcements and other recurrent allocation updates. The updated 2024/25 POD allocations are included in the 2024/25 ICB allocations schedules.

[18] See https://www.england.nhs.uk/wp-content/uploads/2016/04/5-primary-care-allctins-16-17.pdf

K – Primary Care (medical) (Excel file)

This shows the coefficients from the new primary medical services model and data at GP practice level.

The file also shows the calculation of weighted populations for primary medical services and how these are combined with the avoidable mortality weighted populations to give overall weighted populations.

8 Specialised services

8.1 Introduction

From 2023/24 specialised services will begin to be commissioned on an ICS-population footprint, with the majority of services expected to be delegated to many ICBs from April 2024. By integrating the commissioning of specialised services with ICBs' wider commissioning responsibilities, ICBs will be the commissioners of primary, community, secondary and tertiary services allowing them to design and commission care that best suits the needs of their populations. The approach to moving towards delegation of specialised services is set out in the 'Roadmap for integrating specialised services with Integrated Care Systems'.[19]

A new allocations model for physical health specialised services has been developed to support this process. (A needs based allocations model for specialised mental health services is also being developed, and should be in place to support allocations for 2025/26.) The new needs-based model uses an alternative dataset and has significantly higher coverage of specialised services. The model is designed to cover all services that will be subject to delegation. A Specialised Needs-based Allocations Methodology paper detailing the development of the new model is available on the allocations website.[20]

8.2 New model

8.2.1 The dependent variable

The previous specialised services model used data from the SUS+ dataset, which was insufficiently comprehensive and only around half of specialised services spend could be modelled. For the new model, the Patient Level Contract Monitoring (PLCM) datasets have been used to create the dependent variable for the model – the specialised services expenditure on each person during 2019/20. In order to remove the impact of the Covid-19

[19] https://www.england.nhs.uk/wp-content/uploads/2022/05/PAR1440-specialised-commissioning-roadmap-addendum-may-2022.pdf

[20] https://www.england.nhs.uk/allocations/

pandemic on the dependent variable, the model is based on spend on specialised services from March 2019 to February 2020.

8.2.2 Services covered

The model covers all specialised physical health services excluding:

- highly specialised services and the Cancer Drugs Fund as these are to continue to be commissioned nationally;
- services for which the main dataset is insufficient but for which an alternative approach based on other data sources provides a better estimate of a fair share allocation. HIV services – where for confidentiality reasons data are not available – and neonatal intensive care, are modelled separately from the main model.

8.2.3 Need estimated from past healthcare use

Relative need was estimated from past patterns of utilisation of health services. Specialised services expenditure per head in 2019/20 were calculated for each individual registered with a GP practice in March 2019 from the PLCM datasets.

Statistical modelling was used to select the 'best fit' drivers of relative costs at the person level and the relative weights for each driver. The quantified relationships found were taken to be predictors of relative future, cost-weighted need for health care services, with the exception of the supply variables (the impact of which are neutralised).

8.2.4 Explanatory variables

The modelling tested a wide range of potential variables to select those that were the best in statistical terms, and also plausible indicators of need, to be included in the final model. Morbidity (previous diagnoses) and age were the most important variables in the model.

The impact of deprivation on need is therefore captured via the association between deprivation and morbidity. Age also is largely captured through higher levels of morbidity in older people which is directly associated with greater use of specialised services).

An extensive set of explanatory variables were gathered for testing in the model. The starting point for this list were the variables tested in the general and acute model as summarised in table 2. A full account of the variables tested in the specialised physical health models are set out in the Specialised Needs-based Allocations Methodology paper.

8.2.5 Supply variables

The utilisation of health care may also be affected by the relative availability of health care services. Variables were tested in the modelling to adjust for this, known as supply variables. The supply variables tested in the model include those used in the general and acute model as summarised in table 3.

An additional set of provider variables were also included as supply effects for the specialised services model. The dependent variable for the specialised services model includes the actual cost to commissioners of activity. This contrasts with the general and acute model, where the model is based on cost-weighted activity using the national tariff (or equivalent).

We therefore include provider variables in the specialised model to account for provider efficiency and local-pricing variation. The provider variable attributed to each registered patient for each provider is the share of the patients at their GP practice that have received specialised care at that provider during 2017/18 and 2018/19.

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 costed need for health care services because of weaker referral pathways (perhaps due to lower capacity or longer distance) or because local providers are cheaper or more efficient, this does not lead to lower predicted need.

8.2.6 Adjustment for HIV

HIV services could not be included in the aggregate physical health model because, for reasons of confidentiality, information about the personal diagnostic history could not be linked to information about utilisation of these services.

HIV services represent around 2.9% of specialised physical health services total spending (excluding highly specialised services), and the geographical distribution of need for this service is unlikely to match that of other specialised services. It was therefore necessary to construct a separate model of the likely pattern of need for HIV services and to use that to make an adjustment to the target allocation for physical health services.

The dataset from Public Health England that has been used to develop the HIV adjustment suggests that some 95% of the variation in spend on HIV by ICS-population is explained simply by variation in the number of patients. So, our approach is to adjust the fair-shares allocation by taking the segment of spend on HIV and allocating it notionally to ICBs *pro rata* to the distribution of the 85,143 patients.

8.2.7 Adjustment for Neonatal Critical Care (NCC)

Because NCC services are provided for persons who do not have a medical history and have not been born at the start of the target year, they could not be included in the main model of specialised services utilisation.

NCC services represent around 5.5% of specialised physical health services total spending (excluding highly specialised services), and the geographical distribution of need for this service is unlikely to match that of other specialised services. It is therefore necessary to construct a separate model of the likely pattern of need for NCC services and to use that to make an adjustment to the target allocation for physical health services.

To model NCC service use, an area-based model of cost-weighted resource use has been developed. The model predicts NCC service need in an area on the basis of the number of babies born in the target year modified to allow for the greater likelihood of critical care use in areas with a higher proportion of births of low gestational length' (Other potential drivers of need, including deprivation, were not found to be significant, their impact likely being captured by the gestational length variable.)

8.2.8 Implementing the model

The refresh modelled need in 2019/20 for those registered with a GP practice in March 2019 using values of the explanatory variables in 2017/18 and 2018/19.

In previous allocations rounds, where a GP practice has opened or been newly formed since the modelling was undertaken, the average need per head by age-sex group for the

relevant CCG was used. As ICBs are now such large areas, the average need per head by age-sex group has been calculated for local authority districts (LADs). This allows for more variation in need within ICBs to be accounted for.

The HIV and NCC adjustments are applied at ICB level weighted based on the proportion of physical health specialised services spent on these services.

L – Specialised services need per head 2023/24 and 2024/25 (Excel file)

This shows the need per head for each age-sex group for each GP practice. It also shows where the LAD average need per head by age-sex group was used for new practices.

The file also shows each GP practice and ICB's registrations weighted for need for specialised services.

9 Convergence

9.1 Principles of convergence

Actual allocations have been derived from target allocations through a convergence policy. This sets a base growth, reflecting typical pressures, including estimated growth in weighted population. A convergence factor is then applied, such that ICBs that are furthest above target receive less funding growth than in the base growth, and those that are furthest above receive more funding growth.

This approach moderates the move from the baseline towards target allocations to:

- ensure the maximum growth for the furthest below target is set at a level that balances achieving an acceptable distance from target with setting growth at a level that can be effectively deployed
- ensure the minimum growth for the furthest over target is set at a level that allows stability of services and creates confidence for medium term planning
- avoid year-on-year volatility in allocations for those ICBs close to their target allocation
- produce a distribution of allocations that does not exceed the available budget.

9.2 Setting the baseline

9.2.1 2023/24 baseline

The baseline for 2023/24 is based on the 2022/23 allocation, plus a number of adjustments including:

- locally agreed transfers;
- corrections for recurrent adjustments made in 2022/23 for inflation and pay;
- population adjustments; and
- a baseline reset.

The baseline reset addresses issues in the attribution of funding between commissioners that have arisen from the Covid emergency financial framework. The block contracts values and the distribution of system top up to a host commissioner that was necessary under this framework has meant that, while the providers were in receipt of the totality of resources available, the funding is not necessarily flowing from the appropriate commissioner. The exercise was undertaken to correct any material issues in funding flows between NHS commissioners and providers in different systems.

9.2.2 2024/25 baseline

The baseline for 2024/25 is the 2023/24 allocations, however these have been adjusted to reflect recurrent changes that have been made. More detail can be found in the Revenue Finance and Contract guidance.[21] .

9.3 Setting the convergence

9.3.1 Base growth

Having set the baseline, setting the allocation for future years begins by setting the base growth. For core allocations, the average base growth represents the level of funding needed for known cost pressures, including inflation and population/activity growth. This is estimated to be 5.28% for core services in 2023/24. For primary medical care the average base growth is set at the average growth (5.6% in 2023/24) which reflects the GP contract, population growth and a transfer of funding into primary medical care allocations from core allocations.

While the average population growth in 2023/24 is approximately 0.4% this is not true for all ICBs. The base growth for a particular ICB is therefore adjusted to reflect the local change in the weighted population, at uniform MFF.

9.3.2 Convergence

For each ICB a convergence is then set based on the distance from target (DfT) after base growth. The ICBs that are furthest above target will see the largest negative convergence, while those that are below target see positive convergence. Broadly this moves systems towards target, while moderating that growth to ensure systems are financially stable and, for systems that are close to target, we avoid destabilising systems by making changes due to small data fluctuations.

One purpose of the convergence factor is to produce a distribution of funding which does not exceed the available budget. This reflects the fact that the baselines (+ base growth) are supported by non-recurrent funding and need to be reduced to the level funded by the NHS England settlement. The 2023/24 and 2024/25 (published and updated) convergence for ICB core, and primary care services are in Table 7.

We made a number of additional allocations during 2023/24 to provide funding for material pressures that were not in our original assumptions. For instance, we made additional allocations for recurrent pay pressures and inflation. These are significant enough that we have chosen to add them to the published 2023/24 allocation to create a new baseline and estimate new base growth and convergence parameters that reflect these changed pressures, as well as other changes such as the latest estimates of inflation, published by

[21] https://www.england.nhs.uk/operational-planning-and-contracting/

the Office for Budget Responsibility after the 2023 Autumn Statement.[22] However, to preserve some stability to support planning distances-from-target have not been recalculated.

For 2024/25 allocations, base growth for core services has been increased from 3.22% to 4.21% and the rate of convergence has been slowed for over target systems by a factor of 0.8. For primary medical care services base growth has increased by 0.01%, convergence is unchanged.

Table 7: Convergence

2023/24			2024/25		
DfT after base growth	**Convergence**		**DfT after base growth**	**Previously published convergence**	**Revised Convergence**
	ICB core services				
Less than -3%	+0.20%		Less than -3%	+0.20%	+0.20%
Between -3% and 0%	Varies uniformly		Between -3% and 0%	Varies uniformly	Varies uniformly
Between 0 and +0.71%	Varies uniformly		Between 0 and +1.38%	Varies uniformly	Varies uniformly
Greater than +0.71%	-0.71%		Greater than +1.38%	-1.36%	-1.09%
	Primary care				
Less than -4%	+1.00%		Less than -4%	+1.00%	+1.00%
Between -4% and 0%	Varies uniformly		Between -4% and 0%	Varies uniformly	Varies uniformly
Between 0% and 0.38%	Varies uniformly		Between 0% and 0.42%	Varies uniformly	Varies uniformly
Greater than +0.38%	-0.38%		Greater than +0.42%	-0.40%	-0.40%

9.3.3 Specialised Services Convergence

For specialised services we adopt a similar approach to convergence as that adopted for core and primary medical services convergence, with the same underlying principles as laid out in section 9.1. Base growth is estimated to be 5.09% for specialised services in 2024/25. The 2024/5 convergence for specialised services is shown in Table 8.

The final step in setting actual budgets is to make adjustments for high cost drugs and devices (HCDD). The fair share determined for each ICB-population by convergence policy includes HCDD but this component of the budget is managed centrally. We therefore partition the converged ICB-population allocation to create a contribution to the HCDD budget. This contribution recognises that the fastest growth in demand for HCDD is likely to be in systems with more intense use of HCDD. This is done by growing the proportion of HCDD spend in the baseline by a fixed growth factor, so that the total HCDD budget matches national assumptions. So, if for ICB *i* the proportion of HCDD spend in 2023/24 is

[22] Economic and fiscal outlook – November 2023 - Office for Budget Responsibility (obr.uk)

HCDD23/24 then $HCDD_{24/25} = HCDD_{23/24}(1 + g_{HCDD})$ where g_{HCDD} is the HCDD growth factor.

In systems with low HCDD use this can leave them with high growth in the remaining, physical health services allocation. So, for over-target systems we increase the convergence so that the maximum growth for physical health services is 1.9% for 2024/25, which nevertheless exceeds the gross cost uplift factor of 1.7%. This creates additional convergence of up to 0.8% for the over target systems.

Table 8: Specialised Services Convergence

DfT after base growth	Convergence
Less than -13.5%	+0.20%
Between -13.5% and 0%	Varies uniformly
0	0%
Between 0 and +0.78%	Varies uniformly
Between +0.78% and +11.1	-1.1%
Between 11.1% and +23.2%	Varies uniformly
Greater than +23.2%	-1.3%
HCDD growth factor	3.66%

N – Primary medical care convergence (Excel file)

This file sets out the calculation of the convergence for ICBs for primary medical care

O – ICB core convergence (Excel file)

This file sets out the calculation of the convergence for ICB core services (2024/25 now superceded)

P – Specialised services convergence (Excel file)

This file sets out the convergence for physical health specialised services

10 Running cost allowances (RCA)

10.1 Overall envelope

Published RCAs were updated in June 2023 to reflect the outcome of the pay award for 2023/24. The total ICB running cost allowance for 2023/24 increased from £1,081m to £1,109m, with corresponding increases also to 2024/25 and 2025/26.

Pre-delegation ICB RCAs covering 2024/25 and 2025/26 are already published, as part of the 30% real terms reduction by 2025/26, with a total pre-delegation ICB running cost allowance for 2024/25 of £909m.

The published figures do not include any allocation for the impact of delegation in 2023/24. ICBs will separately receive additional recurrent RCA, on a population basis, to reflect the 2023/24 transfer of staff.

10.2 Calculation of running cost allowances

10.2.1 Approach

Shares of the running cost allowance for ICBs in 2023/24 are based on the relative share of running costs in ICBs in 2022/23. These shares are maintained in 2024/25 and 2025/26.

S – Running cost allowances (Excel file)

This shows the calculation of running cost allowances for 2023/24, 2024/25 and 2025/26.

Annex 1: Age-cost curves

Age-cost curves show the relative cost per head of providing NHS services to different age and sex groups, and are derived from the research to develop the formulae used to allocate resources to NHS organisations.

The age-cost curves are not used in the funding formula directly, but age and gender are taken into account in the formula in the modelling of the need for health care services at the person level or small area level. The age-cost curves are included here as they are sometimes helpful for other analyses. The age-cost curves are given below. Note that:

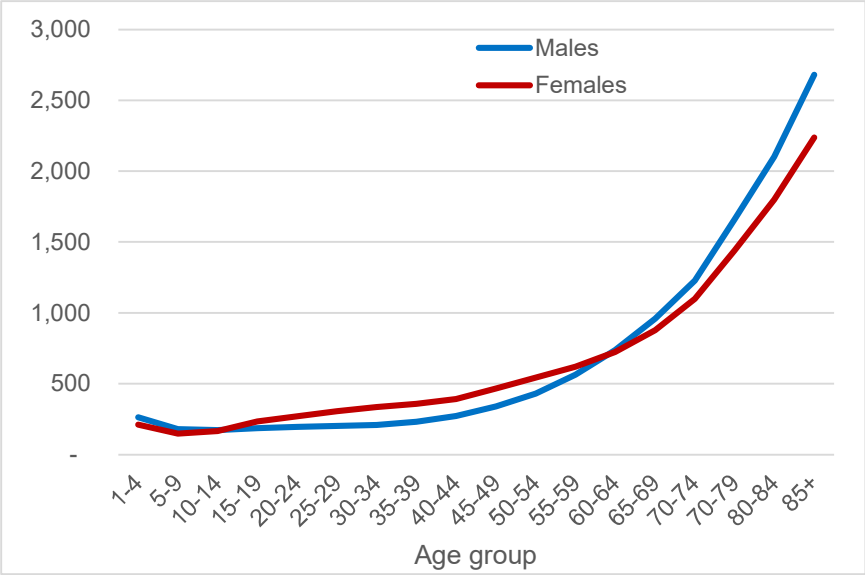
- they are for different years for different components, reflecting the data used for the underpinning modelling.
- they show total costs for each age-sex group or age-sex weights (the latter where additional need weights cannot be broken down by age-sex group).
- some are actual costs from the data used for the modelling and some are predicted costs from the modelling, dependent on the availability of cost data.

General and Acute

Table A1 shows the modelled cost per head for 2018/19 from the refresh of the general and acute formula as outlined in Section 4.2. They include inpatient, outpatient and A&E attendances. They exclude mental health, maternity and specialised services.

Table A1: General and acute age-cost curve

Age group	Males	Females
0	460	365
1-4	262	209
5-9	179	149
10-14	172	165
15-19	187	233
20-24	195	269
25-29	201	306
30-34	209	335
35-39	231	358
40-44	272	392
45-49	340	466
50-54	430	543
55-59	563	619
60-64	738	723
65-69	958	877
70-74	1228	1098
75-79	1658	1440
80-84	2103	1799
85+	2682	2239



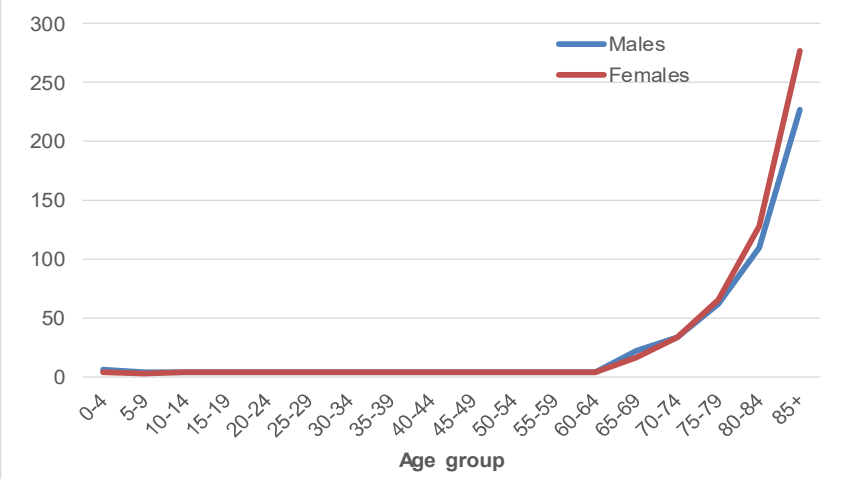
Community services

Table A2 shows the modelled cost per head derived from the community services formula as outlined in Section 4.3. This is the full community services model, based on district nursing contacts, which is applied to 50% of community services spend in the ICB allocations formula.

The data for the modelling did not include those aged under 15, so the general and acute (G&A) model age-cost curve was used as a proxy. The ratios of the G&A age-cost curve for the age groups 0-4, 5-9 and 10-14 (as a proportion of the G&A age-cost curve for those aged 15-19) were calculated and applied to the community services age-cost curve for those aged 15-19.

Table A2: Community services age-cost curve

Age group	Males	Females
0-4	5.7	3.6
5-9	4.0	2.7
10-14	4.1	3.0
15-19	4.1	4.1
20-24	4.1	4.1
25-29	4.1	4.1
30-34	4.1	4.1
35-39	4.1	4.1
40-44	4.1	4.1
45-49	4.1	4.1
50-54	4.1	4.1
55-59	4.1	4.1
60-64	4.1	4.1
65-69	21.7	16.3
70-74	32.9	32.6
75-79	61.5	64.5
80-84	109.0	127.0
85+	226.4	276.2



Mental health

Table A3 shows the modelled cost per head for 2015/16 derived from the 2018 refresh of the mental health formula as outlined in Section 4.4.

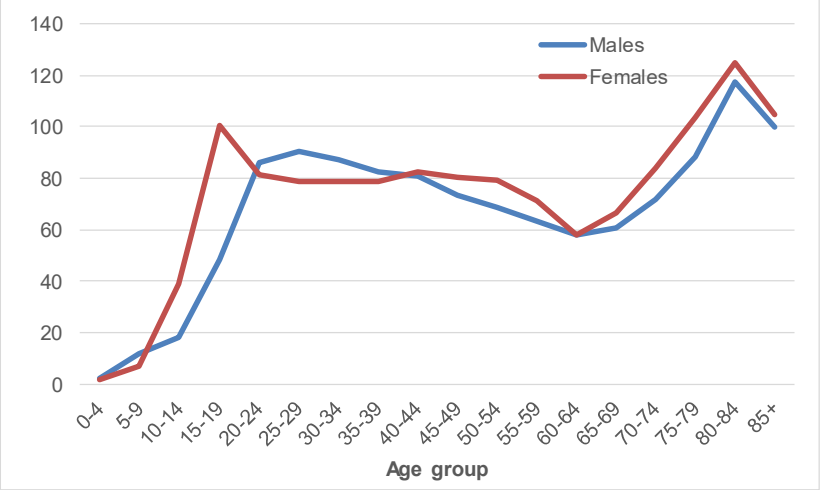
The individual cost of mental health services in 2015/16 was estimated as a function of individual and area level need and supply predictor variables in 2013/14 and 2014/15. Activity data were from the Mental Health and Learning Disabilities Dataset (MHLDD) and the Improving Access to Psychological Therapies (IAPT) dataset for 2015/16 and were costed using Reference Costs for 2015/16.

The data for the modelling did not cover those aged under 20 so inpatient and outpatient activity data from the 2017/18 Mental Health Services Data Set (which contains data for

children and young people) were used. Weights for each age-sex group 0-4, 5-9, 10-14 and 15-19 were calculated from the estimated service cost of each age-sex group expressed as a proportion of costs for those aged 20-24. These weights were then applied to the need per head for those aged 20-24 from the adult model to estimate need per head for the under 20 age-sex groups. The age-cost curve excludes the MFF and specialised mental health services.

Table A3: Mental health age-cost curve

Age group	Males	Females
0-4	2.0	1.6
5-9	11.9	7.0
10-14	17.9	38.9
15-19	48.2	100.1
20-24	86.0	81.1
25-29	90.4	78.8
30-34	87.0	78.4
35-39	82.1	78.8
40-44	80.7	82.2
45-49	73.2	80.4
50-54	68.7	79.3
55-59	63.0	71.3
60-64	58.0	57.9
65-69	60.5	66.3
70-74	71.9	83.9
75-79	88.4	103.7
80-84	117.6	124.7
85+	100.1	104.7



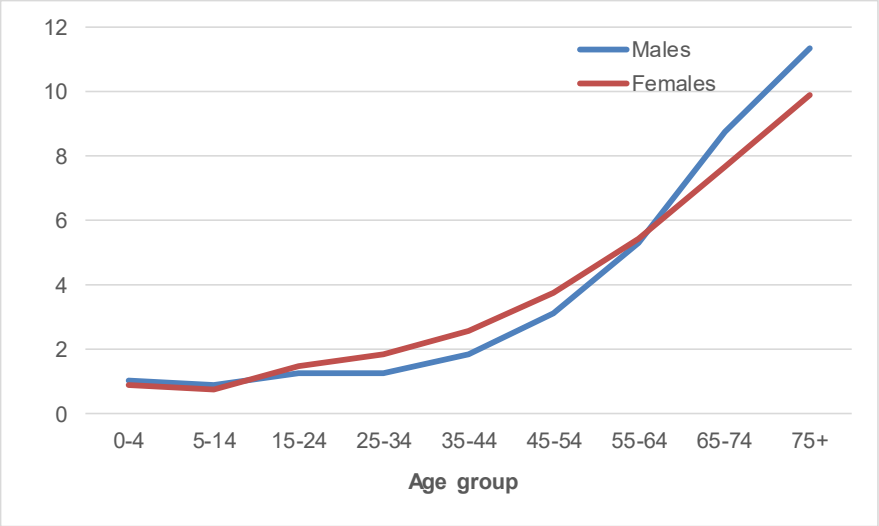
Prescribing

Table A4 shows the prescribing age-cost curve, better known as Age, Sex and Temporary Resident Originated Prescribing Units (ASTRO-PUs) developed by NHS Digital. The latest available are for 2013. These are based on actual costs rather than modelled costs.

This weighting is designed to weight individual GP practice populations for age and sex to allow for better comparison of prescribing patterns. The number of temporary residents attending practices is no longer captured or included in funding allocations. The weightings are standardised (based on a male child under 4 years being 1.0) and are used in the prescribing resource allocation model to calculate the expected cost of drugs prescribed for each GP practice

Table A4: ASTRO(13)-PUs

Age group	Males	Females
0-4	1.0	0.9
5-14	0.9	0.7
15-24	1.2	1.4
25-34	1.3	1.8
35-44	1.8	2.6
45-54	3.1	3.7
55-64	5.3	5.4
65-74	8.7	7.6
75+	11.3	9.9



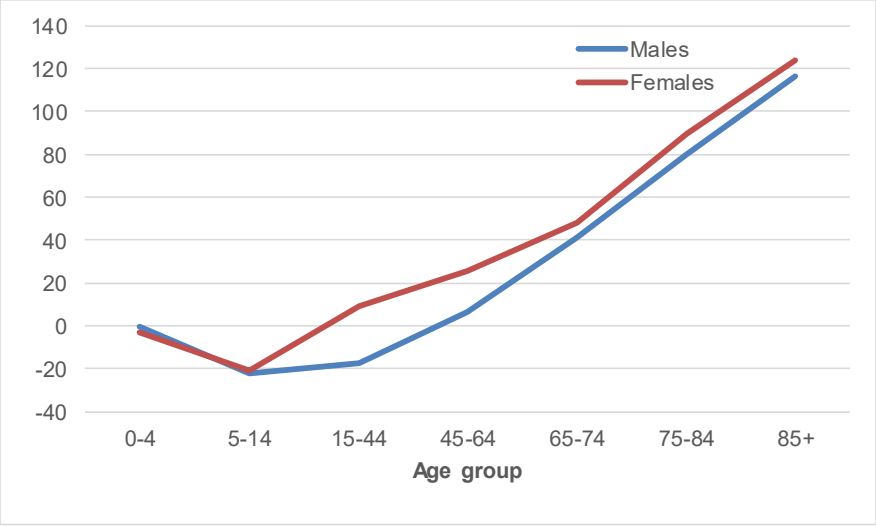
Primary Medical Care

Table A5 shows the Primary Medical Care (PMC) age-cost curve derived from the 2015 refresh of the PMC allocation formula. The model estimated the effects of patient and practice characteristics on GP practice workload (see Section 7). The modelling produced age-sex coefficients that represent the estimated average number of additional weighted contact minutes that a patient in each age-sex group has with their GP surgery compared to the baseline, that is a male patient aged 0-4.

The primary medical care age-cost curve is for modelled weights per head by age-sex group, not modelled or actual costs. The age-cost curve excludes need over and above that related to age and sex, and also differences in costs, such as the MFF, which cannot be broken down by age-sex group.

Table A5: Primary medical care age-gender workload coefficients

Age group	Males	Females
0-4	0.0	-3.2
5-14	-22.4	-20.9
15-44	-17.2	9.1
45-64	6.7	25.7
65-74	41.1	48.1
75-84	80.5	89.4
85+	116.7	123.5

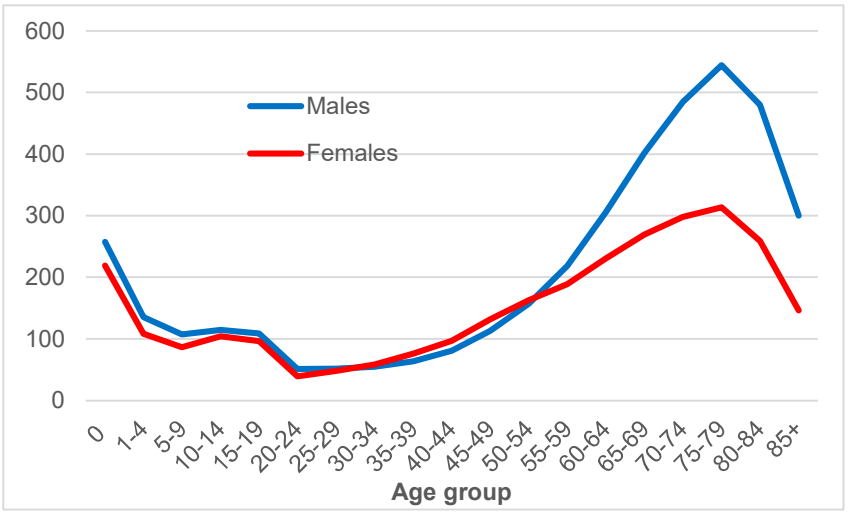


Specialised services

Table A6 shows the modelled cost per head for physical health specialised services from the model developed for 2024/25 allocations. This excludes highly specialised services and specialised mental health services. The model adjustments for HIV and NCC are not included.

Table A6: Specialised services age-cost curve

Age group	Males	Females
0	258	219
1-4	135	108
5-9	107	86
10-14	115	104
15-19	109	96
20-24	51	40
25-29	52	48
30-34	55	58
35-39	63	76
40-44	81	97
45-49	113	132
50-54	157	163
55-59	218	189
60-64	305	230
65-69	402	269
70-74	485	298
75-79	545	314
80-84	480	259
85+	300	146



Annex 2: References

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, 7th Edition*
http://webarchive.nationalarchives.gov.uk/20120503034600/http:/www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_124946

Health Economics Research Unit (HERU), *The Staff Market Forces Factor component of the resource allocation weighted capitation formula: new estimates*
http://webarchive.nationalarchives.gov.uk/20120503034600/http:/www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122621.pdf

NHS Digital, Patients registered at a GP Practice
https://digital.nhs.uk/data-and-information/publications/statistical/patients-registered-at-a-gp-practice

NHS England, *Allocation of resources to NHS England and the commissioning sector for 2019/2020 to 2023/24*, 31 January 2019 NHS England Board paper
https://www.england.nhs.uk/wp-content/uploads/2019/01/04-pb-31-01-2019-ccg-allocations-board-paper.pdf

NHS England, Financial Allocations 2016/17 to 2020/21 and the Allocations published on 108 January 2019
https://www.england.nhs.uk/allocations/

NHS England, *Long term plan*, January 2019

https://www.longtermplan.nhs.uk/

NHS England, *NHS Operational Planning and Contracting Guidance 2023/24*

https://www.england.nhs.uk/operational-planning-and-contracting/

NHS England, *Technical Guide to Integrated Care Board allocations 2022/23 to 2024/25 allocations*

https://www.england.nhs.uk/publication/technical-guide-to-integrated-care-board-allocations-2022-23-to-2024-25/

NHS England, *Technical Guide to allocation formulae and pace of change for 2019/20 to 2023/24 revenue allocations*

https://www.england.nhs.uk/publication/technical-guide-to-allocation-formulae-and-pace-of-change-for-2019-20-to-2023-24-revenue-allocations/

NHS England, *Who pays? Determining which NHS commissioner is responsible for commissioning healthcare services and making payments to providers*, June 2022
https://www.england.nhs.uk/who-pays/

NHS England and NHS Improvement, *A guide to the market forces factor*, January 2019

https://improvement.nhs.uk/documents/475/Guide_to_the_market_forces_factor.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

ONS 2018 based Subnational Population Projections (SNPP) for local authorities
https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandz1

Public Health England, *Severe mental illness (SMI) and physical health inequalities*, September 2018

https://www.gov.uk/government/publications/severe-mental-illness-smi-physical-health-inequalities

Report of the Resource Allocation for Mental Health and Prescribing Project (RAMP)
http://webarchive.nationalarchives.gov.uk/20120503034600/http:/www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122619.pdf

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)*
https://www.england.nhs.uk/wp-content/uploads/2013/08/ann-c1-res-all-mh.pdf

Files - person based resource allocation for mental health report and Person based resource allocation for mental health tables
http://www.england.nhs.uk/2013/08/15/rev-all-wrkshp/

Annex 3: List of documents published alongside the technical guide

A set of ACRA papers and research reports will be published shortly.

This guide will be updated once these are published.

ACRA papers

Research reports

Spreadsheet files

A Registered populations by GP practice and ICB
B General and Acute need
C Community Services need
D Mental Health need
E Maternity need
F Prescribing need
G Avoidable mortality weighted populations
H Market Forces Factor
I Emergency Ambulance Cost Adjustment
J Overall weighted populations for core services for ICBs and GP practices
K Primary medical care
L Specialised services need
N Primary medical care convergence
O ICB core convergence
P Specialised services convergence
S Running cost allowances
X Boundary changes

Equality Analysis

Equality Analysis for 2022/23 revenue allocations to Integrated Care Boards is available in Annex 4 of this document.

Annex 4: Equality and Health Inequalities Analysis

This document presents our analysis into how equality and health inequalities are accounted for in the 2022/23 revenue allocations to Integrated Care Boards. This analysis remains appropriate for 2023/24 allocations.

1. 2022/23 revenue allocations overview

The proposal covers resource allocation to Integrated Care Boards (ICBs). The formulae underlying these allocations aim to support equal opportunity of access for equal need and contribute to the reduction of health inequalities amenable to healthcare.

The resource allocations cover:

- Core ICB services
- Primary medical care

1. Steps in setting allocations

The following steps have been followed to allocate resources, once the national budgets are known:

Determine target allocations based on relative need and relative unavoidable costs
Establish baselines (based on previous year's funding)
Calculate base uplift of baselines, using estimated pressures.
Determine distances from target, based on long term financial trajectory
Determine convergence (how far ICB areas are moved closer to their long-term target allocations each year through efficiencies. Convergence balances, within the available resources, providing stability in funding for all organisations and moving them towards their long-term target.)

2. Target shares

The national weighted capitation formulae are used to calculate an ICB's target share of the available resources. Target shares are in proportion to each ICB's population weighted by the need for health care services (such as that due to the age

profile of the population). There are also weights to account for differences in unavoidable costs due to location in providing healthcare services between geographical areas across England.

The target shares of the long-term financial trajectory give each ICB's target allocation in monetary terms.

There are separate weighted capitation formulae for ICBs' core responsibilities, and primary medical care. The weighted capitation formulae are recommended by the Advisory Committee on Resource Allocation (ACRA). ACRA is an independent, expert, technical committee and its membership includes GPs, academics, public health experts and NHS managers. ACRA's recommendations are evidence based from research and statistical modelling.

3. Equality

Equality is at the heart of the weighted capitation formulae. The formulae recommended by ACRA aim to allow local organisations to commission similar levels of health services for populations with similar levels of need (horizontal equity), and appropriately higher levels of health services for populations with higher levels of need (vertical equity).

The principle of a weighted capitation formula was established in 1976 following the Report of the Revenue Working Party (RAWP). RAWP interpreted its terms of reference as being: “to reduce progressively, and as far as feasible, the disparities between the different parts of the country in terms of the opportunity for access to health care of people at equal risk.”

4. Weighted capitation formulae

The weighted populations for ICBs are based on:

- the population base – a count of the population each ICB is responsible for;
- a weight, or adjustment, for higher need for health care services due to age (areas with more elderly populations receive higher allocations per head, all else being equal);
- a weight, or adjustment, for additional need for health services over and above that due to age (areas with poorer health receive higher allocations, all else being equal);
- an adjustment for unmet need and health inequalities;
- a weight, or adjustment, for unavoidable differences in the costs of providing health services due to location alone – the Market Forces Factor (areas where the cost of living, land etc. are higher receive higher allocations, all else being equal);
- in the formula for core ICB allocations, an adjustment for the higher costs of providing emergency ambulance services in sparsely populated areas, and an adjustment for the higher costs faced by unavoidably small hospitals in remote areas providing 24-hour accident and emergency services. This round of resource allocations also adds an adjustment for excess PFI (private finance initiative) financing costs.

The values of the weights per head differ between the formulae for ICB core allocations and primary medical care due to differences in relative need across the country for the respective health services.

The weighted capitation formula for ICB core allocations also has separate components for general and acute, community, mental health, maternity and prescribing. This is because need varies differently across the country for each of these services, and the available datasets, and so analytical approaches, vary in each case.

The research developing general and acute, maternity and mental health models used data at the individual level (anonymised) to provide accurate estimates of the different needs of different individuals and population groups. The exception to this was the prescribing formula, as data were only available at GP practice level. This is an improvement on previous approached which typically estimated need for small areas. However, due to limitations to data availability, at present the community services component of the formula does uses small areas data.

5. Adjusting for different characteristics

Observing need per head directly has not proved possible to date. Instead statistical modelling has examined the relationship between the utilisation of health services on the one hand, and the characteristics of individuals (including data on diagnoses) 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. Factors were selected based on their statistical significance in predicting future need for healthcare resources and the plausibility of the relationship.

Need related to age and sex

People do not have identical needs for health care services. A key difference is that need varies according to age and sex, 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 formulae therefore take into account the relative need per head of different age-sex groups and the different age-sex profiles of local populations.

Additional need (over and above that related to age and sex)

Even when differences related to age and sex 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 related to age and sex is therefore necessary. This adjustment is based on morbidity indicators and population characteristics, such as the underlying indicators from the Index of Multiple Deprivation, associated with morbidity.

Need related to age, sex and additional need over and above that due to age and sex are estimated as a single set of weights rather than two separate sets of weights in the general and acute, mental health, maternity and primary medical care models. This is because additional need varies by age-sex group and differentially across the country by age-sex group. The prescribing formula estimated need related to age-sex separately to additional need due to data availability.

Additional need for general and acute and mental health services was estimated using morbidity data based on the diagnoses for hospital inpatient admissions for each patient.

The Index of Multiple Deprivation (IMD) was used in the primary medical care formula due to the absence of other information in the data set available for the modelling. The prescribing formula also uses the IMD, and proxies for morbidity mainly from the Population Census.

Supply side variables

The models also include ‘supply’ variables to take account of the greater availability of health care services generally leading to higher use. While the supply variables are included in the models, they are set to the national average when calculating weighted populations. This means areas are not penalised in the formula for lower utilisation due to relatively lower capacity.

Unmet need and health inequalities adjustment

The models typically assess need as it is currently met by NHS services and therefore may not capture unmet need or inappropriately met need. Typically, the most deprived communities do not access health care in the most appropriate way, resulting in poorer health outcomes. NHS England also has a duty to have regard to the need to reduce inequalities between patients in access to, and outcomes from, healthcare services.

There is an adjustment for unmet/inappropriately met need and health inequalities in the weighted capitation formula, which was recently reviewed by ACRA. In the previous allocation round, the adjustment was based on the standardised mortality ratio for those under 75 years of age (SMR<75). The advantage of this measure is that it is relatively stable at the CCG level across successive periods, and it is relatively straightforward to understand and interpret. SMR<75 also comes with some disadvantages, however. It relies on premature mortality being a reliable proxy for morbidity as well as mortality inequalities. This is not always the case, e.g. for mental health and musculoskeletal conditions where disease results in disability rather than death. Furthermore, SMR<75 related only indirectly to health inequalities experienced by persons over 75 years of age.

The review considered six other candidate measures and assessed these measures against five criteria, each of which check whether the measure is fit for use in the adjustment. These criteria are whether the measure is:

published regularly
available for small geographic areas
based on robust sources
technically appropriate
correlated with deprivation.

The review concluded that the adjustment should use a bespoke definition of avoidable mortality. Avoidable mortality is a better fit to the definition of health inequalities as deaths have been identified where they could have been prevented, or treated, by more timely and effective healthcare intervention. The bespoke definition extends the scope of the definition used by the Organisation for Economic Co-operation and Development (OECD) by including deaths due to some causes to all age groups, where these causes are considered avoidable for all ages. The impact of a move from SMR<75 to the bespoke definition of avoidable mortality is small, but favours redistribution to younger and most deprived areas.

The adjustment is calculated for the population of each small area (Middle layer Super Output Area (MSOA)) and then aggregated to ICB level. Applying the measure at the small area level takes into account unmet need/health inequalities within as well as between ICBs. To turn this into a revenue adjustment an exponential weighting is applied, meaning that a higher weight per head is given to the small areas with the worst avoidable mortality rate.

ACRA's recommendations are principally based on research and modelling. However, due to the lack of robust quantitative evidence on unmet need which is comprehensive and consistent between services and across the country, ACRA's recommended measure to be used for the unmet need and health inequalities adjustment was largely pragmatic and based on judgement. Ongoing research commissioned by the National Institute of Health Research (NIHR) is currently investigating how an equitable resource allocation may account for unmet need.

ACRA was unable to recommend the share of the overall weighted capitation formula that should be based on the unmet need and health inequalities adjustment. The NHS England Board meeting of 17 December 2015 decided that the share should be 15% for primary medical allocations and 10% for CCG (now: ICB) core allocations. We have decided to continue using these weightings in the proposed allocations.

The share is highest for primary medical care as it is expected that unmet need and health inequalities can be more effectively addressed through primary medical care than through secondary care.

Unavoidable costs

The weighted capitation formula includes adjustments for unavoidable costs due to location, so that areas with higher costs are not disadvantaged in their allocations. The adjustments for higher unavoidable costs include the market forces factor (MFF), the emergency ambulance cost adjustment (EACA), and an adjustment for remote hospitals. This round of resource allocations also adds an adjustment for excess PFI (private finance initiative) financing costs.

The MFF adjusts for unavoidably higher unit staff and premises costs, which are higher in particular in London. The EACA adjusts for the longer journey times of ambulances in sparsely populated areas, and the final adjustment is for the higher costs of hospitals because of unavoidable smallness due to remoteness.

6. Convergence policy

Convergence policy sets actual allocations by determining how far ICBs are moved closer to their long-term target allocation each year. Convergence policy balances, within the available resources, providing stability in funding for all organisations with moving those furthest away from target towards their target.

7. Local Commissioning and Provider Decisions

NHS England provide Integrated Care Boards with allocations for their ICB based on the principles outlined above. However, ultimately the commissioning decisions of individual ICBs and the operational decisions of individual providers are a key determinant of the impact on protected groups.

2. How do the 2022/23 revenue allocations formulae reflect health care needs of protected characteristic groups?

This section provides an assessment of the way in which the 2022/23 revenue allocations formulae reflect health care needs of protected characteristics groups.

1. Age

The weighted capitation formulae specifically takes into account the different needs for health care services by age group, which are especially higher for older age groups and significantly greater for the oldest age groups. For example, the general and acute formula gives a weight per head 4 times higher for those aged 65 to 69 year compared with those aged 20 to 24 years, and 10 times higher for those aged 85 years and over compared with those aged 20 to 24 years.

The needs of the most elderly are also reflected in the community services model. Need for these services increases much more rapidly with age than for other services.

The increased need of young children is also reflected in the model, although this is less significant than for older people.

The updates to the general and acute model has improved the way that age is accounted for in the models. Previously the effect of age was modelled for 5-year age groups. An alternative 'splines' approach has been implemented that allows the relationship between age and cost to vary within these 5-year age groups.

Furthermore, the use of a bespoke definition of avoidable mortality in the health inequalities and unmet need adjustment sees a small redistribution to younger populations compared to the previously used SMR<75. It also takes explicit account of deaths of people over 75 years that are considered avoidable which is an improvement on the previous approach which did not include the deaths of people over 75.

2. Disability

The aim of the formula is to equalise allocations relative to health needs across ICBs, and therefore directly reflect need due to disability. For example, the general and acute and mental health models are largely based on past patterns of morbidity at the individual level as measured by diagnostic data for hospital admissions. The prescribing formula also includes morbidity measures, such as the proportion of the local population with activity limiting health conditions. The data available for the primary medical care formula did not include data on disability, but the Index of Multiple Deprivation (IMD) was used as proxy for poorer health.

There is also a separate unmet need/health inequalities adjustment. This is because the models typically assess need as it is currently met by NHS services and therefore may not capture unmet need or inappropriately met need. Typically, the most deprived communities do not access health care in the most optimal way, resulting in poorer health outcomes.

In the previous and current round the unmet need/health inequalities adjustment has been adjusted to ensure it is sensitive to the most severe challenges, using measures of mortality and more resources are thus targeted at those communities with the worst scores on these measures.

A criticism of this approach is that it may be less sensitive to inequalities associated with mental health conditions and learning disabilities. Despite an active research programme, we have not yet identified a suitable alternative measure. This work will continue.

3. Gender Reassignment and/or people who identify as Transgender

These groups' treatment needs, as for all population groups, will be included in the diagnostic information used in the general and acute and mental health services formulae. Beyond this, there is a lack of data on the groups' needs suitable for consideration for use in an allocations formula and so there is no specific adjustment in the formulae. As for other groups, local commissioners and providers are subject to the public sector equality duty.

4. Marriage & Civil Partnership

Marital and civil partnership status was tested in developing the formulae and found to be statistically significant in general and acute and not statistically significant in the mental health formula.

In the mental health formula and the update of the general and acute formula we use a new variable that allows us to characterise the household that an individual lives in.

The available data did not permit marriage and civil partnership to be tested as an additional variable in the primary medical care workload formula.

5. Pregnancy and Maternity

There is a separate maternity formula within the formula for ICB core allocations to take account of the specific health care needs related to pregnancy and maternity.

6. Race and ethnicity[1]

The mental health, prescribing, maternity, and general and acute formulae include ethnicity variables. The modelling for the mental health formula and general and acute formulae use individual ethnicity data where available from administrative datasets. The modelling tested 16 ethnicity variables, which is an improvement on the previous formula which only used 4 ethnicity variables.

For some groups the modelling suggested lower than typical need. This was not supported by any other evidence, and so we have interpreted this as unmet need, removing this lower than typical need from the model. This uses a standard statistical approach, the sterilisation of counter intuitive variables.

The research for the prescribing and maternity formulae did not have data on ethnicity for each individual. Instead the proportion of people by ethnic group in each individual's area of residence was used from the Population Census (place of residence was defined by Lower Level Super Output Area – LSOA). A number of variables for ethnicity were tested and the proportion of non-white people in the prescribing formula and the proportion of black African ethnic groups for maternity were found to be statistically significant with a positive coefficient, indicating higher need.

7. Religion and belief

Religion or belief have previously been tested for inclusion in the general and acute formula and found not to be statistically significant (over and above the other variables in the model, such as diagnoses). It was tested for a previous version of the mental health model, with the same result. This has not been re-tested for this iteration due to lack of data availability.

8. Sex

The weighted capitation formula directly takes account of the different needs of males and females in each age-group. For example, the need for general and acute services for women in their 30s is higher than that for men, while the need for general and acute services for men aged 85 and over is higher than for women.

The mental health component has separate formulae for men and women of working age as their needs were found to be different.

9. Sexual orientation

These groups' treatment needs, as for all population groups, will be included in the diagnostic information used in the general and acute and mental health services formulae. Beyond this, there is a lack of data on needs that are specific to orientation and so there is no specific adjustment in the formulae. As for other groups, local commissioners and providers are subject to the public sector equality duty and the health inequality duty

The sexual orientation monitoring information standard has the potential to improve recording of sexual orientation and we will adjust our approach as the data quality and coverage allows it.

3. How do the 2022/23 revenue allocations formulae reflect health care needs of people who experience health inequalities?

This section provides an assessment of the way in which the 2022/23 revenue allocations formulae reflect health care needs of people who experience health inequalities.

1. Looked after children and young people

There is no specific adjustment in the formulae for looked after children and young people.

Where looked after children and young people present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality and public sector equality duty.

2. Carers of patients

There is no specific adjustment in the formulae for carers. Data on voluntary care was tested for inclusion in the general and acute formula but was not found to be statistically significant.

Where carers present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality and public sector equality duty.

3. Homeless people

There is no specific adjustment in the formulae for homeless people and rough sleepers.

Where homeless people and rough sleepers present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality duty and public sector equality duty.

The basis of our allocations is the registered population of the ICB; we have been unable to identify suitable data to make an adjustment for unregistered people. There is evidence that, despite NHS guidelines, homeless people may face greater

challenges registering with a GP (eg https://www.healthwatch.co.uk/news/2018-03-23/improving-access-gp-services-people-who-are-homeless) and, for this and other reasons, studies have shown that they are less likely to be registered with a GP (eg, Elwell-Sutton, Fok, Albanese, et al, 2017, Journal of Public Health, 39, 26–33, https://academic.oup.com/jpubhealth/article/39/1/26/3065715) and so their need may not be adequately reflected in the utilisation based element of the formula.

This is part of our rationale for including a component for unmet need and health inequalities in our formula. As part of the recent review of this adjustment, ACRA considered available data on population groups that experience poorer health outcomes and are underrepresented in GP registrations, and therefore may not be reflected well in the resource allocation formulae, in particular homeless and traveller populations. The review found that available data suffer from quality issues, but nevertheless concluded that a separate adjustment for these groups would not make a material difference to the weighted populations used in resource allocations.

Work will continue in this area through monitoring available data and ongoing research commissioned by the National Institute of Health Research (NIHR) on how an equitable resource allocation may account for unmet need specifically, which will be relevant for this particular group.

4. People involved in the criminal justice system

There is no specific adjustment in the formulae for people involved in the criminal justice system.

Funding for health care in prisons is currently directly commissioned by NHS England and is therefore not covered by the ICB allocations formulae.

Where people involved in the criminal justice system (but outside of prison) present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality and public sector equality duty.

5. People with additions and/or substance misuse issues

A number of diagnostics that are linked to alcohol and drug misuse were considered for inclusion in the model, although most proved not to be statistically significant indicators of future need for healthcare. However, in the mental health model we found a significant relationship with the diagnostic “poisoning by adverse effect of and under dosing of drugs, medicaments and biological substances (ICD-10 codes T36-T50)”

6. People or families on a low income

Measures of deprivation are routinely tested in the development of allocations formulae. The percentage of people in receipt of benefits and/or DLA/PI have been found to be indicative of higher need for general and acute and mental health services. Other deprivation measures are also statistically significant in the general and acute and mental health models.

There is also a separate unmet need/health inequalities adjustment based on the avoidable mortality rate for small areas (MSOAs). This measure is strongly correlated

with deprivation (using the Index of Multiple Deprivation (IMD)). The IMD, in turn, consists of several domains including income and employment deprivation. This adjustment is included because the models typically assess need as it is currently met by NHS services and therefore may not capture unmet need or inappropriately met need. Typically the most deprived communities do not access health care in the most optimal way, resulting in poorer health outcome.

7. People with poor literacy or health literacy

There is no specific adjustment in the formulae for people with poor literacy or health literacy.

Where people with poor literacy or health literacy present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality and public sector equality duty.

8. People living in deprived areas

Measures of deprivation are routinely tested in the development of allocations formulae.

Areas with greater socio-economic disadvantage typically have poorer health after accounting for age and higher health care needs. This is reflected in the formulae through the inclusion of morbidity data or indicators. Morbidity data were not available for the primary medical care formula, and the Index of Multiple Deprivation was included instead.

There is also a separate unmet need/health inequalities adjustment based on the avoidable mortality rate for small areas (MSOAs). This measure is strongly correlated with deprivation (using the Index of Multiple Deprivation). This adjustment is included because the models typically assess need as it is currently met by NHS services and therefore may not capture unmet need or inappropriately met need. Typically the most deprived communities do not access health care in the most optimal way, resulting in poorer health outcome

9. People living in remote, rural and island locations

A set of supply variables are included to take account that greater availability of health care services generally leads to higher use. While the supply variables are included in the models, they are set to the national average when calculating weighted populations. This means areas are not penalised in the formula for lower utilisation due to relatively lower capacity, which may be the case in rural/remote locations.

There is a separate adjustment in the ICB core allocation to account for the additional costs of providing hospital services in remote areas. The Emergency Ambulance Cost Adjustment (EACA) also reflects the additional costs of providing ambulance services in remote areas. ACRA considered whether rurality should be included as a factor in the Primary Care model in determining workload but advised that it should be excluded from the model. This was because of the uncertainty over whether it was reflective of additional workload or systematic behaviour in rural practice not arising from workload.

10. Refugees, asylum seekers or those experiencing modern slavery

There is no specific adjustment in the formulae for asylum seekers and/or refugees, or for those who have experienced human trafficking or modern slavery.

Where asylum seekers, refugees, or those who have experienced human trafficking or modern slavery present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality duty and public sector equality duty

11. Other groups experiencing health inequalities

- ***Ex-service personnel / veterans***

There is no specific adjustment in the formulae for ex-service personnel or veterans.

Where ex-service personnel or veterans present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality duty and public sector equality duty.

- ***Those who have experienced Female Genital Mutilation (FGM)***

There is no specific adjustment in the formulae for those who have experienced FGM.

Where those who have experienced FGM present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality duty, public sector equality duty and Safeguarding Children Guidelines.

- ***Gypsies, Roma and travellers***

There is no specific adjustment in the formulae for Gypsies, Roma and travellers.

Where Gypsies, Roma and travellers present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the health inequality duty and public sector equality duty.

The basis of our allocations is the registered population of the ICB; we have been unable to identify suitable data to make an adjustment for unregistered people. Studies of rates of GP registration show wide variation (from 50-91% - Aspinall, 2005, A Review of the Literature on the Health Beliefs, Health Status, and Use of Services in the Gypsy Traveller Population, and of Appropriate Health Care Interventions, Health ASERT Programme Wales Report Series, see https://kar.kent.ac.uk/9170/1/Aspinall_GypsyTraveller_ASERT.pdf) and it is likely that overall Gypsies, Roma and travellers are less likely to be registered with a GP, and so their need may not be adequately reflected in the utilisation based element of the formula.

This is part of our rationale for including a component for unmet need and health inequalities in our formula. As part of the recent review of this adjustment, ACRA considered available data on population groups that experience poorer health outcomes and are underrepresented in GP registrations, and therefore may not be reflected well in the resource allocation formulae, in particular homeless and traveller populations. The review found that available data suffer from quality issues, but nevertheless concluded that a separate adjustment for these groups would not make a material difference to the weighted populations used in resource allocations.

Work will continue in this area through monitoring available data and ongoing research commissioned by the National Institute of Health Research (NIHR) on how an equitable resource allocation may account for unmet need specifically, which will be relevant for this particular group.

- ***Those living with mental health issues***

A specific component of the formula is designed to estimate need for mental health services and so support equal opportunity of access for those services. In addition, we have increased the importance of this component, relative to other aspects of care, aligning it with the latest comprehensive information on mental health spending.

We expect mental health services to be an area of continuing research interest in future allocation cycles, particularly as data quality improves.

- ***Sex workers***

There is no specific adjustment in the formulae for sex workers.

Where sex workers present with higher levels of need this will be reflected in the diagnostic flags and may attract a higher weight. As for other groups, local commissioners and providers are subject to the public sector equality duty.

4. Sources used in the analysis

1. Published evidence

Data sets and sources used in the models, explored for inclusion but rejected, or used for cross checking and validation include:

- SUS-PbR (inpatient, outpatient, A&E)
- Hospital Episodes Statistics
- Patient Level Contact Monitoring dataset
- Mental Health Minimum Dataset
- IAPT dataset
- Master Patient Index

Census 2011 local area characteristic measures including:

- Ethnicity
- Household type
- Household tenure

- Residents of communal establishments
- Marital status
- Car or van availability
- Religion
- Long-term health problem or disability
- Working status
- Routine occupation
- Schoolchildren and students living away from home.

DWP

- Working age benefit claimants
- Eligibility for DLA/PIP

Office for National Statistics

- General Health (very good, good, fair, bad, very bad) by age group
- Long-term health problem or disability
- Approximate social grade

QOF

- Atrial fibrillation
- Cancer
- Cardiovascular disease
- CKD
- Coronary heart disease
- Dementia
- Depression
- Diabetes
- Epilepsy
- Heart failure
- Hypertension
- Hypothyroidism
- Learning disabilities
- Mental health
- Peripheral artery disease
- Palliative care
- Stroke and TIA

Indices of multiple deprivation 2019

- IMD underlying indicators

Population data

- Resident from ONS
- GP Registered populations from PDS
- new registration data from NHS Digital

GP Patient Survey

Health inequalities and unmet need adjustment candidate measures:

- SMR<75
- Avoidable mortality
- Healthy Life Expectancy (HLE)
- Disability Free Life Expectancy (DFLE)
- Electronic Frailty Index
- ONS Health Index

Mental health data not already covered in the above:

- Adult Psychiatric Morbidity survey
- Mental Health of Children and Young People in England survey
- Small area mental health index (SAMHI)
- Rate of people subject to the mental health act per 100,000 people

Data on hard to measure population groups affected by health inequalities from Ministry for Housing, Communities and Local Government (MHCLG):

- Traveller Caravans per local authority, January 2020
- Percentage of households assessed as homeless per local authority, July 2020
- Number of people accessing emergency accommodation per local authority, January 2021

Key gaps in this evidence are mental health need at the small area level, and data on hard to measure groups affected by health inequalities at the small area level.

2. Consultation and involvement findings

Consultations were held with ACRA, CCGs and NHS E&I.

a. Regular formal consultations with ACRA (2019-2021):

The Advisory Committee on Resource Allocation (ACRA) makes recommendations on the preferred, relative, geographical distribution of resources for health services.

ACRA is an independent, expert committee comprising of GPs, public health experts, NHS managers and academics. ACRA meetings occur quarterly, during which ACRA members steer research leading up to the recommendations for resource allocations.

The supporting ACRA sub-group, the Technical Advisory Group (TAG) also meets on a needs-basis, to discuss more technical aspects of the allocations formulae.

In addition, there have been six meetings of the Health Inequalities Task and Finish Group, a sub-group of ACRA, for the health inequalities and unmet need adjustment review.

Supporting minutes and papers for these meetings will also be published.

b. Engagement with CCGs (2020/2021)

The review of the health inequalities and unmet need adjustment included engagement with CCGs who gain most from the adjustment to understand their needs of a health inequalities adjustment and supporting information around this, to facilitate and

empower them to commissioning decisions that address and reduce health inequalities in their areas.

The informal consultations with CCGs engaged a very small number of CCGs only and therefore findings may be biased to these CCGs.

c. NHS E&I written internal consultation (October/November 2021)

The review of the health inequalities and unmet need adjustment received an internal review by key NHS E&I stakeholders, to allow ACRA to consider these comments and update their recommendation if necessary.

5. Outstanding key issues.

1. Improving availability and quality of data on individual characteristics

There are currently gaps and quality issues around certain data on individual characteristics, such as on ethnicity and mental health. These could be addressed through, for example, accessing newly available datasets or through data linking. The allocation formulae may be greatly improved in terms of accurately capturing individual characteristics if more and greater quality data are available. This will require liaison with data owners and processors to improve and access these data.

2. How can the health inequalities and unmet need adjustment be improved further?

In particular:

- How can mental health inequalities be better captured in the health inequalities and unmet need adjustment?
- How may an equitable resource allocation account for unmet need specifically?

Regarding health inequalities and mental health, the following would improve this further:

A review of newly available data; understand how ICBs address inequalities in mental health and how this affects cost and; assess the feasibility of developing a composite indicator for use as a possible mental health inequalities adjustment.

This will be part of a future ACRA work programme.

Regarding unmet need, this is already the topic of ongoing research commissioned by the National Institute of Health Research (NIHR).

As the NIHR project on unmet need may yield a separate adjustment for unmet need, future work should consider how the current health inequalities and unmet need adjustment should change.

This will be part of a future ACRA work programme.

3. **How has COVID-19 impacted need for healthcare (and health inequalities) and how does this need to be reflected in the allocation formulae?**

Longer-term data on the impact of Covid on healthcare need and health outcomes by population characteristics.

This will be part of a future ACRA work programme.

6. Summary of this analysis

The proposal covers resource allocation to ICBs. The formulae underlying these allocations aim to support equal opportunity of access for equal need and contribute to the reduction of health inequalities amenable to healthcare.

The models typically assess need as it is currently met by NHS services and therefore may not capture unmet need or inappropriately met need. Typically, the most deprived communities do not access health care in the most appropriate way, resulting in poorer health outcomes. NHS England also has a duty to have regard to the need to reduce inequalities between patients in access to, and outcomes from, healthcare services.

There is an adjustment for unmet/inappropriately met need and health inequalities in the weighted capitation formula. This is based on the avoidable mortality rate for small areas (MSOAs). The adjustment is calculated for the population of each small area and then aggregated to ICB level. Applying the measure at the small area level takes into account unmet need/health inequalities within as well as between ICBs.

This adjustment will support and encourage services, including integrated services, that could reduce health inequalities.

[1] Addressing racial inequalities is about identifying any ethnic group that experiences inequalities. Race and ethnicity includes people from any ethnic group incl. BME communities, non-English speakers, Gypsies, Roma and Travelers, migrants etc.. who experience inequalities so includes addressing the needs of BME communities but is not limited to addressing their needs, it is equally important to recognise the needs of White groups that experience inequalities. The Equality Act 2010 also prohibits discrimination on the basis of nationality and ethnic or national origins, issues related to national origin and nationality.