



***Report of the Advisory
Committee on Resource
Allocation***

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Summary of Recommendations

The Advisory Committee on Resource Allocation's (ACRA) review of the weighted capitation formula culminated in a series of recommendations to Ministers on potential changes to the weighted capitation formula, which will ultimately be used to inform Primary Care Trusts (PCTs) revenue allocations.

A list of ACRA's main recommendations is below.

Population base for revenue allocations

- That the definition of a PCT responsible population is tied explicitly to responsible commissioner guidance, and that PCT responsible populations continue to comprise GP registered populations, and unregistered resident population components that can be defined robustly and accurately using nationally available data.
- That Office for National Statistics (ONS) population projections continue to be used as the basis for resource allocation for 2009/10 and 2010/11.
- That all prisoners are counted in the population base of the PCTs where prisons are located, rather than only those who are serving sentences over six months as at present, (excluding the primary care components of the formula – prescribing and primary medical services – because the budget for prison primary healthcare remains centrally funded).
- That prisoners receive the national average needs weighting rather than the PCT specific needs weighting.
- That armed forces receive a national average needs weighting, rather than the needs weighting of their host PCT as previously, (excluding the primary care components of the formula).
- That all asylum seekers, after their initial applications and processing, are counted and receive a national average needs weighting.
- That temporary residents are removed from the prescribing component of the formula as the relevant data is no longer collected.
- That GP registered lists should be used as the population base for future resource allocation (post 2010/11) if GP registered lists can be demonstrated to be robust and up-to-date.

Need Formula

- That in the new acute formula, age and additional need are calculated in a single index rather than separately as present.
- That the new formulas for acute and maternity are based on admitted patient and outpatient data for the first time.
- That there will be new separate needs formulas for acute and maternity, replacing the current combined formula.
- That there will be a new need formula for prescribing.
- That the mental health formula will not be changed as the review did not produce a need formula that is robust and an improvement on the current mental health formula.
- That resources for community health services be allocated using the acute index and resources for learning disabilities be allocated using the acute and mental health indices.
- That the English Language Difficulty Adjustment is removed because its differential impact on allocations is not significant.
- That there should be a separate formula for health inequalities.
- That no further adjustment is made for rurality.

Health Inequalities

- That there should be a separate health inequalities formula and that disability free life expectancy is used as the health inequalities measure.
- That the weight to be given to the health inequalities formula should be a ministerial decision as no technical way of assessing how much weight should be applied to the health inequalities formula has been found.
- That the health inequalities formula should be applied to all elements of the weighted capitation formula except mental health and HIV/AIDS.
- That the health inequalities formula is an interim measure and that the issue of health inequalities and resource allocation should form part of ACRA's future work programme.

Market Forces Factor

- That there is still a requirement for a market forces factor (MFF) component within the weighted capitation formula and that it should continue to be based on the General Labour Market approach.

- That part-time workers are included in the calculation of the MFF as they reflect a significant part of the general labour market and the NHS workforce.
- That City of London workers are included in the calculation of wage differentials used to produce the MFF.
- That a job responsibility adjustment is made to the MFF to recognise the fact that the same job titles reflect different jobs in different parts of the country.
- That the staff MFF is not applied to spend on doctors as their costs (e.g. productivity and vacancy rates) do not vary differentially across the country as they do for other groups of workers.
- That the “raw” MFFs, i.e. the differentials in pay rates, should be smoothed to reflect actual labour markets using a method that takes into account the distance from all other PCTs, not just neighbouring PCTs to recognise the fact that NHS organisations in one PCT might draw their labour force from a variety of PCT areas.
- That provider-level MFFs should be additionally smoothed (“interpolated”) to reflect the distance of the provider site(s) from the centre of each PCT, rather than only taking the MFF of the PCT in which they are situated. This will help to reduce significant differences between the MFFs of some neighbouring providers.
- That no further adjustment is made for rurality.

Future Work

- ACRA has recommended a move from using ONS population projections to a count of GP registrations as the population base for revenue allocations post 2010/11, subject to GP registrations being accurate and up-to-date. This will be considered as part of ACRA’s future work programme.
- In addition, ACRA acknowledged that the recommendation made in relation to health inequalities should only be seen as an interim measure. Further work will be undertaken to examine the issue of health inequalities and resource allocation.
- ACRA will also be progressing its longer term work programme to produce a “person-based” formula that can be used to support practice based commissioning, which could potentially be used as the basis for allocations to PCTs sometime after 2010/11.
- ACRA expressed concern about the availability and quality of data, particularly in relation to community health services, people with learning disabilities and mental health. ACRA is to consider what data is currently available, and what data is required to inform future resource allocation. ACRA will work more pro-actively with the Information Centre for Health and Social Care to specify data requirements for resource allocation rather than only consider data that is currently available.

Section 1

Introduction

- 1.1 This is a report of the review of the weighted capitation formula undertaken by the Advisory Committee on Resource Allocation (ACRA) from 2005 to 2008.
- 1.2 The review has culminated in a series of recommendations to Ministers on potential changes to the weighted capitation formula to be used to inform revenue allocations to Primary Care Trusts (PCTs) post 2008/09.
- 1.3 The formulation of ACRA's recommendations is the result of a robust process. ACRA has commissioned independent research into the main elements of the weighted capitation formula, and has reviewed the research at key stages. Technical scrutiny of the research has been undertaken by ACRA's Technical Advisory Group (TAG).
- 1.4 ACRA believes that the recommendations set out in this report will produce a more technically robust allocations formula, based upon the best research and data currently available.

ACRA's review of the weighted capitation formula

- 1.5 ACRA continually oversees the development of the weighted capitation formula used to inform PCT revenue allocations.
- 1.6 The weighted capitation formula is used to determine PCTs' target shares of available resources, to enable them to commission similar levels of health services for populations in similar need, and since 2003/04, to help reduce avoidable health inequalities between areas and individuals.
- 1.7 The starting point of the formula is the population count. Each PCT's "crude" population is then adjusted or weighted according to its relative need (age, and additional need) for healthcare and the unavoidable geographical differences in the cost of providing healthcare (the market forces factor).

- 1.8 ACRA has reviewed the main elements of the weighted capitation formula:
- the population base – how relevant PCT populations are counted;
 - the need formula – which accounts for differences in age and health status across PCTs; and
 - the market forces factor (MFF) – which accounts for unavoidable differences in the costs of treatment across PCTs. This element also forms part of Payment by Results (PbR).
- 1.9 As part of the reviews of the need formula and MFF, ACRA also considered how the formula takes account of specific issues faced by rural areas.
- 1.10 ACRA completed its work programme in March 2008, in time to inform decisions about allocations for 2009/10 and 2010/11.
- 1.11 It is important to note that the weighted capitation formula is used to set PCT target allocations. Actual allocations are informed by pace of change policy – how quickly PCTs are moved towards their target allocation through the distribution of additional funding. The decision on pace of change policy is reserved for Ministers and does not fall under ACRA's remit.
- 1.12 Information on ACRA's role, terms of reference and objectives can be found at Appendix 1. Membership of ACRA and TAG is at Appendices 2 and 3.

Evaluation criteria

- 1.13 ACRA adopted evaluation criteria for resource allocation formulas to guide the decision making process. These criteria are set out at Appendix 4.

Research reports

- 1.14 The final research reports supporting ACRA's work programme have been published. A full list of the reports is set out at Appendix 5 and copies can be found at www.dh.gov.uk/allocations

Other publications

- 1.15 At the request of the Secretary of State for Health, a review of ACRA's role in the development and application of the current weighted capitation formula has been undertaken. The final report by Professor Gwyn Bevan (ACRA and TAG member) is available at www.dh.gov.uk/allocations

- 1.16 Further detailed information about the application of weighted capitation formula referred to in this report can be found in *Resource Allocation: Weighted Capitation Formula (Sixth Edition)*. This report can be found at www.dh.gov.uk/allocations
- 1.17 For information on actual PCT allocations, including baselines, weighted capitation targets, distances from targets and pace of change policy, please refer to the 2009/10 and 2010/11 *Exposition Book*. This report can be found at www.dh.gov.uk/allocations

Section 2

Populations

- 2.1 Population figures form the starting point for the calculation of weighted capitation targets. The robustness, reliability and accuracy of the population counts are, therefore, crucial in delivering a fair and equitable outcome to the resource allocation process.
- 2.2 In April 2005, ACRA commissioned the Prescribing Support Unit of the Information Centre for Health and Social Care to review the methodology for establishing a population base for PCT revenue allocations, and to present options and recommendations around the establishment of a population base to underpin future PCT revenue allocations.
- 2.3 The review included:
- a review of the definition of PCT responsible populations;
 - a description of the population bases (and data sources) currently used in the PCT revenue allocation formula;
 - an assessment of the potential effect of new or forthcoming policy initiatives on the definition of PCT responsible populations, or on services to be covered by future resource allocation exercises;
 - a review of available data sources with the potential for inclusion within the population base for PCT revenue allocations post 2007/08;
 - the definition of data requirements for discussion with potential data providers, and the subsequent agreement of data specifications to inform project data analysis and modelling;
 - the development of alternative approaches to establishing a PCT population base, using population components derived from data obtained from various sources; and
 - analysis and assessment of the alternative approaches.
- 2.4 The final report, *Review of the Population Base for PCT Revenue Allocations Post 2007/08*, can be found at www.dh.gov.uk/allocations.

- 2.5 Following the review, ACRA made a set of recommendations on the population base to be used for revenue allocations post 2008/09. These are set out below.

PCT Responsible Population

- 2.6 The review examined the definition of a PCT responsible population for revenue allocation purposes.
- 2.7 Responsible commissioner guidance dictates that GP registered populations associated with PCTs (as opposed to people resident within PCTs' statutory boundaries) are the foundation for a PCT responsible population.
- 2.8 Additionally, responsible commissioner guidance dictates that the PCT population base should also include PCT resident populations that are not registered with GPs.
- 2.9 The connection between resource allocation to PCTs as commissioners of healthcare and responsible commissioner guidance necessitates a continuation of the approach to establishing a population base. Namely that the population base comprises GP registered populations and unregistered resident populations.
- 2.10 Therefore, ACRA agreed a new definition of a PCT responsible population for revenue allocation purposes:

Health services are for people, and the primary determinant of resource allocation to PCTs must be the size of the populations for which PCTs are responsible.

Equitable PCT resource allocation must therefore be based on reliable and robust population counts in respect of the following elements which comprise the PCT responsible population:

- *The number of people permanently registered with the GP practices that make up each PCT. This means that patients permanently registered with a GP practice in one PCT area, who are resident in a neighbouring or other PCT area, remain the responsibility of the PCT with which their registered GP practice is associated.*
- *PCTs are also responsible for residents within their geographical boundaries who are not permanently registered with a GP practice, and for whom the*

PCT is the responsible healthcare commissioner of services funded by PCT revenue allocations. For example:

- The number of convicted prisoners present in prisons located within a PCT will be included within the responsible population count of that PCT.*
- The number of UK and foreign armed forces, and the dependants of foreign armed forces, will be included in the responsible population counts of PCTs.*
- The number of people housed in asylum seeker initial accommodation or asylum seeker removal centres within a PCT will be included in the responsible population count of that PCT.*
- People who are not permanently registered with any GP practice, and for whom the PCT is the responsible healthcare commissioner of services covered by PCT allocations (for example on the basis of usual place of residence), should – insofar as possible on the basis of data available – be included in the responsible population count of that PCT. This group includes migrant workers from European Union (EU) countries.*

Recommendation

That the definition of a PCT responsible population is tied explicitly to responsible commissioner guidance, and that PCT responsible populations continue to comprise GP registered populations, and unregistered resident population components that can be defined robustly and accurately using nationally available data.

Calculation of PCT relevant populations

2.11 Currently, four sources of data are used to establish PCT responsible populations, and are the population base for the weighted capitation formula:

- The Attribution Dataset (ADS) of GP registrations, derived from the National Health Applications and Infrastructure Services (NHAIS) system.
- Sub-national population projections for local authority areas, provided by the Office for National Statistics (ONS).
- Information on prisoner populations, from ONS.
- Information on UK armed forces, foreign armed forces and foreign armed forces' dependants, from ONS.

- 2.12 The calculation of PCT relevant populations involves scaling GP registered populations to resident populations based on the ONS Census. There is some variation between lists of patients on GP registers and ONS populations. The methodology for calculating PCT populations is therefore to constrain GP registered populations to ONS resident populations, ensuring that the PCT relevant populations sum to the ONS population for England and that differential list variation in different parts of the country does not distort resource allocation.
- 2.13 Unregistered populations (counts of prisoners and armed forces) are added to constrained ADS registered populations to give PCT responsible populations as the basis for the resource allocation formula.
- 2.14 Additionally, temporary resident counts are included in the current formula in the computation of an age/sex index for the calculation of prescribing weighted populations.
- 2.15 The resulting PCT population counts, by age band and gender, are then used as the foundation for the weighted capitation formula. The population counts are weighted for age cost or age/sex cost. The age or age/sex weighted populations are further weighted according to need and cost factors in each of the components of the formula (Hospital and Community Health Services (HCHS), prescribing and primary medical services).
- 2.16 ACRA made several recommendations in relation to the data used to establish PCT relevant populations. These are set out below.

Population base

- 2.17 For PCT resource allocation purposes, population projections for the allocation years are considered the most appropriate source. Thus the 2007/08 PCT revenue allocations (the weighted capitation formula was frozen for 2008/09), were based on ONS 2003 based sub-national population projections for mid-2007, published in 2004. The projections provided information by age band and gender at strategic health authority and local authority district level, but were not available at PCT level.
- 2.18 ACRA has long expressed a desire to move towards the use of GP registrations as the basis for future resource allocation. The review of the population base examined the feasibility of this approach, and looked at the issue of list variation.

- 2.19 List variation between ONS figures and GP registrations has been recognised for many years. Analysis of the 2006 ADS against ONS population projections for 2006 has indicated a level of list variation that would lead to significant changes in PCTs' allocation shares in the event of a change to using unconstrained registered populations. The research highlighted that levels of list variation differ between age bands, and between male and female populations. Levels of list variation also differ between PCTs, and there appears to be no systematic element to the levels of list variation observed, and consequently no single obvious reason for the variation.
- 2.20 Given the above, there is currently no strong evidence to support a change in approach towards the use of unconstrained GP registered populations. Therefore ACRA has recommended that ONS sub-national population projections for local authority districts continue to be used as the basis for resource allocation for 2009/10 and 2010/11. The 2009/10 and 2010/11 revenue allocations will use ONS 2006 based sub-national population projections for mid-2009 and mid-2010 (published on 12 June 2008). To obtain a count of PCT relevant populations, ACRA has advised a continuation of the current approach that counts of GP registered patients are constrained to ONS population projections to achieve the adjustment between registered and resident populations for PCTs.

Recommendation

That ONS population projections continue to be used as the basis for resource allocation for 2009/10 and 2010/11.

Changes to Unregistered Populations

- 2.21 ACRA have also made recommendations as to how some groups who are not registered with GPs, such as prisoners, armed forces and asylum seekers, should be counted and weighted.

Prison populations

- 2.22 Unregistered populations, such as prisoners, are added to the constrained ADS registered populations to give PCT responsible populations as the basis for the resource allocation formula.
- 2.23 ACRA has recommended that the full prison population is counted in the population base of PCTs where prisons are located for revenue allocations post 2008/09, not just those prisoners that have been in custody longer than six months. ACRA recognised that this may result in some double counting

of prisoners who have not de-registered from their home GP, but it was believed preferable to ensure that PCTs with prisons within their area have all prisoners counted within their population base. This change is not relevant for the primary care components of the formula (prescribing and primary medical services) as primary care spending on prisoners is still centrally funded.

- 2.24 In addition, ACRA has recommended that the national average needs weighting should be applied to prison populations, adjusted for age, rather than the PCT specific needs weighting.

Recommendations

That all prisoners are counted in the population base of the PCTs where prisons are located, rather than only those who are serving sentences over six months as at present (excluding the primary care components of the formula – prescribing and primary medical services – because the budget for prison primary healthcare remains centrally funded).

That prisoners receive the national average needs weighting rather than the PCT specific needs weighting.

Armed Forces

- 2.25 As unregistered populations, armed forces are also added to the constrained ADS registered populations to give PCT responsible populations as the basis for the resource allocation formula. They are excluded from the primary care components of the formula (prescribing and primary medical services) because the Ministry of Defence is responsible for the primary care of UK armed forces through the Defence Medical Services.

- 2.26 Currently, the needs weighting of the relevant PCT is applied to armed forces. ACRA has recommended that the national average needs weighting should be applied to armed forces populations, adjusted for age.

Recommendation

That armed forces receive a national average needs weighting, rather than the needs weighting of their host PCT as previously, (excluding the primary care components of the formula – prescribing and primary medical services – because the budget for armed forces primary healthcare remains with the Defence Medical Services).

Asylum Seekers

- 2.27 Asylum seekers are not currently included as a separate count in the population base.
- 2.28 Although it has been documented that asylum seekers have greater health needs than the general population, ACRA has recommended that all asylum seekers, after their initial applications and processing, are counted and that a national average needs weighting should be applied to asylum seeker populations. This is because there is no clear evidence of a relative need weighting and because health costs for asylum seekers during their initial assessment are funded separately.

Recommendation

That all asylum seekers, after their initial applications and processing, are counted and receive a national average needs weighting.

Migrant workers

- 2.29 Migrant workers from the new EU countries are entitled to the same healthcare rights as a citizen in the country, if they have legal documentation. This group, therefore, has to be included in the population counts. ACRA has recommended that ONS estimates should be used to count migrant workers.

Temporary registrations

- 2.30 In the current weighted capitation formula, temporary GP registrations are included in the prescribing component of the formula, in the computation of an age/sex index. Changes to the GP contract mean that information on numbers of temporary registrations is no longer collected nationally, and temporary registrations can only be derived as estimates.
- 2.31 Therefore, ACRA has recommended that temporary registrations should be excluded from PCT population base.

Recommendation

That temporary residents are removed from the prescribing component of the formula as the relevant data is no longer collected.

Future Work

2.32 ACRA's aim is to move towards using GP registered lists as the future population base for revenue allocations. As set out above, there is a difference between registered lists and ONS population estimates and, crucially, this difference varies significantly across the country. Before moving to GP registered lists as the population base, ACRA has recommended that work is commissioned to understand the differences and provide assurances that GP registered lists are accurate and up-to-date.

Recommendation

That GP registered lists should be used as the population base for future resource allocation (post 2010/11) if GP registered lists can be demonstrated to be robust and up-to-date.

Section 3

Need

- 3.1 The weighted capitation formula has two need adjustments – an age related need adjustment and an additional need adjustment.
- 3.2 A principal cause of variation in the level of demand for health services is the age structure of the population. The very young and the elderly, whose populations are not evenly distributed throughout the country, tend to make more use of health services than the rest of the population. The purpose of the age related need adjustment is to allow for varying health care needs associated with the age structure of local populations.
- 3.3 The additional need adjustment reflects the relative need for health care over and above that accounted for by age.
- 3.4 The need element of the weighted capitation formula is included in the components covering HCHS, prescribing, primary medical services and HIV/AIDS. The last comprehensive review of the need element of the weighted capitation formula was undertaken in 2002 by a team led by the University of Glasgow. Their report, *Allocation of Resources to English Areas* (the AREA Report), was published in December 2002 (Sutton et al., 2002) and can be found at www.dh.gov.uk/allocations.
- 3.5 As part of its review of the formula, ACRA commissioned a team led by Brunel University to review the current needs adjustments for HCHS and prescribing and to develop alternatives to them.
- 3.6 The review of the need element of the weighted capitation formula was asked to consider the following objectives:
- equal opportunity of access to health care for people at equal risk; and
 - to contribute to the reduction in avoidable health inequalities.
- Additionally, the formula should be transparent and justifiable to an academic and NHS audience.
- 3.7 The review was carried out in three stages:
- **Stage 1** – a review of the development of the current formulas.

- **Stage 2** – development of alternative formulas that are suitable for future allocations to PCTs.
- **Stage 3** – investigation as to how and whether the proposed formulas could be applied at practice level.

3.8 A copy of the final report, *Combining Age Related and Additional Needs (CARAN)*, can be found at www.dh.gov.uk/allocations.

Age and Additional Needs Index

Acute

- 3.9 The current need formula uses a utilisation-based approach applied to the small area level and has separate indices for age related need and additional need. This is the traditional two-stage approach to developing a weighted capitation formula. Some commentators have criticised this approach and suggested that age related need and additional need should be estimated simultaneously in a one-stage approach.
- 3.10 The researchers found that the factors giving rise to additional needs did vary between age groups. Therefore, ACRA have recommended a one-stage model that has a separate need adjustment for each of 18 age bands (0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+).
- 3.11 ACRA has recommended that the final formula is estimated from a combined dataset for 2004/05 and 2005/06. The reason for this is that using two years of data combined, results in a more stable dataset than using data for a single year, which is important as some of the age-specific models in the stratified one-stage approach are based on relatively small numbers of episodes in some Middle-level Super Output Areas (MSOAs; the units of analysis).
- 3.12 ACRA believes the stratified one-stage approach is superior to previous utilisation models and is an important technical improvement over the current two-stage approach. This is because it allows the relationship between age and additional need to vary between different age groups.

Recommendation

That in the new acute formula, age and additional need are calculated in a single index rather than separately as present.

Use of admitted patient and outpatient data

- 3.13 Historically, the activity data from Hospital Episode Statistics (HES) used in the utilisation approach have comprised hospital admitted patients (inpatient stays and day cases) only. Newly released data from HES on outpatient activity in England have allowed for the inclusion of outpatient activity in a review of the need element of the funding formulas for the first time. ACRA has recommended that the new need formula is based upon this new data. Analysis suggests that outpatient needs are not proportional to admitted patient needs across areas, and therefore the inclusion of outpatient activity data is better able to capture relative health care needs.

Recommendation

That the new formulas for acute and maternity are based on admitted patient and outpatient data for the first time.

Acute and Maternity

- 3.14 The current formula has a single model for acute and maternity services combined. The research for this review developed separate models for acute and maternity. The maternity model was based on a “costs per birth” approach combined with projections of the number of births.
- 3.15 ACRA recommended separate acute and maternity models because it is likely that maternity needs are determined by different factors than acute needs. A “costs per birth” approach was recommended because it is not necessary to model the numbers of births; there are projections of the number of births that can be used in the calculation of target allocations.
- 3.16 Different sources of the number of births were considered. ACRA recommended the use of ONS birth registrations as the basis for allocating maternity spend. The model adjusts births by the expected average cost per birth, which has been shown to vary with socio-economic status.
- 3.17 The new maternity need index is more transparent and a technical improvement over the current combined acute and maternity model. Firstly, this is because its separation from the acute model allows the need factors for both acute and maternity services to be different. Secondly, the separation of total maternity costs into the costs per birth and the number of birth registrations is readily available from the ONS.

- 3.18 ACRA agreed that this approach is simpler and more transparent than the previous maternity model.

Recommendation

That there will be new separate needs formulas for acute and maternity, replacing the current combined formula.

Prescribing

- 3.19 The prescribing model follows similar procedures to the current AREA model. However, it does not include morbidity indices as these were not considered sufficiently transparent. The new model could not adopt the one-stage approach because prescribing activity data is not available for age groups within practices. The new model uses a more comprehensive and up-to-date dataset to develop formulas for resource allocation.

Recommendation

That there will be a new need formula for prescribing.

Mental Health

- 3.20 Several alternative approaches to the current AREA approach to mental health were explored and considered. These included the following:
- stratified one-stage models;
 - modelling activity by diagnosis (dementia versus non-dementia);
 - using the prescribing of anti-depressant drugs as a proxy for community mental health activity; and
 - excluding outliers from the skewed distribution of cost-weighted mental health activity.
- 3.21 ACRA felt that none of the new approaches represented an improvement on the current model and, in particular, ACRA was concerned that cost-weighted activity data were only available for inpatients and outpatients. ACRA took the view that this provides a poor indicator of total need for mental health services because it does not account for community activity. The reason being that the variable shift to community based mental health activity is not picked up by the hospital activity variables used in the current review.

- 3.22 Therefore, ACRA has recommended that the current mental health need formula be maintained.
- 3.23 ACRA further agreed that, in the medium term, further research should be carried out to derive improved mental health models. The collection of community health activity data should be explored, in addition to the potential use of the Mental Health Minimum Dataset.

Recommendation

That the mental health formula will not be changed as the review did not produce a need formula that is robust and an improvement on the current mental health formula.

Community health services and learning disabilities

- 3.24 The researchers explored possibilities for developing need formulas for community health services and people with learning disabilities. Data limitations meant that no such models could be developed.

Recommendation

That resources for community health services be allocated using the acute index and resources for learning disabilities be allocated using the acute and mental health indices.

English Language Difficulty Adjustment

- 3.25 The English Language Difficulty Adjustment (ELDA) is a supplement to the weighted capitation formula introduced for the 1999/2000 allocations.
- 3.26 ELDA is based on research commissioned by ACRA from the University of Warwick. *Assessment of the Costs to the NHS Arising from the Need for Interpreter, Advocacy and Translation* (University of Warwick 1998) explored the relationship between available Health Authority cost data on interpretation, advocacy and translation services, and estimates of the number of people with English language difficulties at Health Authority level.
- 3.27 ACRA has recommended that the ELDA is removed from the resource allocation formula. This is for two reasons: it has no material effect on the target allocations of PCTs; and the data required to support the adjustment can only be updated with difficulty.

Recommendation

That the English Language Difficulty Adjustment is removed because its differential impact on allocations is not significant.

Morbidity indices

- 3.28 The AREA formula included morbidity indices that were calculated by modelling the relationship between socio-economic variables and direct measures of morbidity taken from the Health Survey for England (HSE). These were included in an attempt to capture currently unmet need.
- 3.29 The inclusion of these variables, however, has received criticism on the grounds of transparency – a key attribute in terms of explaining weighted capitation formulas to the NHS. ACRA rejected the use of morbidity indices in the current review on the grounds that they were opaque.
- 3.30 Alternative ways to include additional morbidity using the Quality and Outcomes Framework (QOF) and HES data were considered, but were not adopted. ACRA did not support the use of QOF and HES due to the following concerns:
- the HES morbidity data may reflect unobserved supply; and
 - QOF values may be influenced directly by practices.

Unmet Need

- 3.31 The objectives of the resource allocation formula are to achieve equal access for equal need and to help reduce avoidable health inequalities. The current need formula attempts to adjust for unequal access for equal need within the formula through the identification of “unmet need” for some groups of the population, for example, ethnic minorities.
- 3.32 The AREA model for acute and maternity services included two variables with counter-intuitive signs. Measures of ethnicity and employment deprivation were statistically significant predictors of health need but had negative coefficients. That is, the higher the number of ethnic minority populations in an area and the higher the levels of employment deprivation, the lower the level of health care use.

- 3.33 There are two possible explanations for this perverse result. Firstly, there is “unmet need” i.e. individuals in ethnic minority populations or in employment deprivation receive less care than expected given their relative morbidity, all other things being equal. Or, secondly, individuals in ethnic minority populations and in employment deprivation are healthier than the general population, all other things being equal. Analysis of the HSE by the AREA researchers showed evidence in favour of the former and ACRA included the two variables with the counter-intuitive signs in the model but not in the resource allocation formula.
- 3.34 This adjustment has also received criticism on the grounds of transparency. The inclusion of variables with counter-intuitive signs in the model, but not the formula, ultimately rests on judgement and interpretation.
- 3.35 The current review rejected the use of morbidity indices in the modelling on the grounds that they were opaque. The current review also failed to find clear evidence of unmet need in the stratified one-stage models. Attempts to force employment deprivation and ethnicity variables into the model did not produce a consistent pattern across consecutive age groups, so ACRA decided not to include unmet need in the model.
- 3.36 ACRA believes that the new need model captures met need better than the current model because it is based on a stratified one-stage approach, which separates acute and maternity needs and includes outpatient data. However, as the model is based on the utilisation of health care and does not include variables with counter-intuitive signs, it does little to take account of unmet need. It captures the NHS response to need and existing levels of health inequality. It does nothing to reduce health inequalities. Therefore, it does not explicitly address the second objective of the formula, to help reduce avoidable health inequalities.
- 3.37 ACRA felt that it is technically very difficult to achieve the two objectives of the resource allocation formula within a single formula. To improve the approach to reducing health inequalities through resource allocation, ACRA has recommended a separate formula for health inequalities. This approach has the benefit of being much more transparent in the way it adjusts the formula for health inequalities. It is also easier to update. This is covered under Section 4.

Recommendation

That there should be a separate formula for health inequalities.

Rurality (see also Section 5 on the MFF)

- 3.38 It is argued that as rural communities generally have a higher number of elderly people, the current formula may disadvantage them. The one-stage approach adopted in the review responds to criticism that the impact of age has been understated in previous work.
- 3.39 It is also stated that rural areas may contain hidden pockets of need or unmet need. Deriving formulas from utilisation data may bias the results against rural populations who may not use hospital services as much as urban populations due to relative distance to providers. The review attempted to include a number of rurality indicators and measures of rural deprivation in the CARAN formula, but found they were not statistically significant.
- 3.40 The researchers addressed the concern that the needs of rural populations are not captured appropriately in resource allocation formulas because of the sterilisation of supply factors when computing allocations. They computed needs indices with and without supply factors included, looking at the resultant difference in allocations, and seeing if it was correlated with rurality. This procedure was repeated for a number of scenarios and the results were consistent: rural areas are not disadvantaged by the sterilisation of supply factors when computing allocations.
- 3.41 These findings suggest that the national models proposed in the review are not biased against rural areas. ACRA, therefore, has recommended that there is no need for further adjustment for rurality.

Recommendation

That no further adjustment is made for rurality.

Primary medical services component

- 3.42 The primary medical services component of the formula was not reviewed by ACRA. It closely follows the General Medical Services Global Sum formula which determines payments to GP practices and which was reviewed in 2007. No decisions had been taken on implementing the recommendations from this review at the time of ACRA's review.

Alternatives to the Current Utilisation Approach

- 3.43 In addition to producing a formula using a utilisation based approach applied to the small area level, the researchers also considered two alternative approaches to resource allocation: an epidemiological approach; and, a utilisation based approach using individual level data.
- 3.44 With respect to the epidemiological approach, the researchers considered how it might be used in a resource allocation formula and investigated data requirements and potential data sources. They also investigated the key assumption of proportionality that underpins the approach. On the basis of the research, ACRA advised that this approach is not viable for resource allocation purposes at present. They also recommended that a dedicated and more comprehensive review is undertaken to investigate the feasibility of the approach in the future.
- 3.45 The researchers also investigated the feasibility of undertaking utilisation based analyses at the individual level. They demonstrated a method to construct individual rather than area level models of cost-weighted activity and the results provided encouraging evidence for the future use of this approach. ACRA recommended that further research is undertaken to investigate the feasibility of the approach in future funding formulas.

Section 4

Health Inequalities

- 4.1 The twin objectives of resource allocation are to provide equal access to healthcare for people at equal risk and to contribute to the reduction in avoidable health inequalities.
- 4.2 ACRA concluded that at present it is not technically possible to fully achieve both objectives of equal access for equal need and to reduce health inequalities within a robust and transparent single formula. Therefore, ACRA has recommended that a separate formula, which meets the second objective of helping to reduce health inequalities, would be more technically robust and more transparent.

Requirements from a health inequalities formula

- 4.3 From the outset, ACRA determined that a health inequalities formula must be easy to understand, and responsive to currently unmet need and to the low quality care delivered to disadvantaged groups. By definition, the health inequalities formula must have a steeper need gradient than the utilisation based formula as utilisation based formulas only capture met need.
- 4.4 ACRA agreed that it was important to use robust, high quality data, which are routinely collected across PCTs. It was also considered advantageous to have data available at a level lower than PCT level (including practice level) as this will allow PCTs to target their resources more efficiently. The health inequalities measure should also avoid setting up potential perverse rewards.
- 4.5 In addition, ACRA considered it desirable that the measure of health inequality be forward looking and sensitive to the age profile of the population.
- 4.6 Therefore, in determining a health inequalities formula, ACRA considered:
- what measure of health inequality should be used;
 - how the utilisation formula and health inequalities formula should be combined (weighting);
 - how the health inequality measure should be applied (scaling), for example, whether raw data should be used or whether it should be weighted, and whether a cut-off should be applied; and

- the scope of services to be covered by a health inequalities formula.

Health inequalities measure

- 4.7 Various options were considered as a health inequalities measure, which led to the detailed examination of three alternative measures:
- Disability Free Life Expectancy (DFLE) – defined as expected years of life free from limiting long-standing illness or disability. DFLE is calculated by combining life expectancy with information about limiting long-standing illness¹;
 - Life Expectancy (LE) – LE at birth provides a useful age standardised measure of mortality; and
 - Standardised Years of Life Lost (SYLL) for amenable causes under 75 – SYLL measures years lost from deaths, occurring before the age of 75. Causes of death are included if there is evidence that they are amenable to healthcare interventions.
- 4.8 ACRA's recommended measure of health inequalities is DFLE as, unlike the other measures, it captures morbidity as well as mortality. ACRA felt it was important to include a measure of morbidity in the formula as this was considered to map better to the objective of reducing health inequalities.
- 4.9 Although the latest data available for DFLE combines 2005 life expectancy data with 2001 limiting long-term illness data, the advantages of the measure were seen to outweigh the age of the data. The disability free definition of Healthy Life Expectancy (HLE) is considered more objective than the alternative definition of HLE based on individuals' reporting whether they are in good or fairly good health (or not), although both are self-reported. This measure is also relatively stable over time, and changes are largely due to changes in the life expectancy component rather than the disability free component. ONS also support the use of disability free life years, as it is more objective and more stable year on year.

Recommendation

That there should be a separate health inequalities formula and that disability free life expectancy is used as the health inequalities measure.

1 Amenable Disability Free Life Expectancy (ADFLE) was the preferred conceptual measure of both TAG and ACRA, however, ONS advised ACRA that ADFLE could not be constructed before 2009.

Combining the health inequalities and utilisation formulas

- 4.10 The 'raw' DFLE measure cannot be used directly as it is lower for more deprived PCTs. ACRA has recommended that the measure should be applied by comparing every PCT to a benchmark figure, for example, the local authority with the current highest healthy life expectancy in England.
- 4.11 This 'difference from best' approach was favoured by ACRA as being closer to amenable DFLE than the raw data, although it was noted that differences in DFLE between areas are due to many factors as well as the impact of the NHS, such as income and historical patterns of employment by industry.
- 4.12 ACRA considered several approaches to combining the health inequalities formula with the utilisation formula:
- Additive approach – this is two separate “pots” of funding for the utilisation formula and the health inequalities measure, for example, 50:50;
 - Multiplicative approach – under this approach the (normalised) index from CARAN is multiplied by the (normalised) index for the health inequalities formula to give an overall index for each PCT's target share of resources.
- 4.13 ACRA also considered different ways of constructing the separate pots of funding, including:
- Interventions – this involves assessing the percentage of funding that is (or may be) focused on reducing health inequalities for each programme budget category, based on the extent of health inequality in each category and the effectiveness of spend in reducing inequality. The sum of the percentages (weighted by spend in each budget category) gives an estimate for the size of the health inequalities pot. This would then be combined additively with the utilisation formula.
 - Quality Adjusted Life Years (QALYs) – a QALY is an index which has a value of one for a year of full health and the value of zero for the worst health state, usually being dead (there are some health states so severe that respondents in surveys class them as worse than death). Health states ranging from poor health through to nearly full health have intermediate values depending on the precise health status. In technology assessments, the National Institute for Clinical Excellence (NICE) use a threshold of £20,000 to £30,000 per QALY. Allocating each PCT £20,000 to £30,000 for each amenable year of life lost below the age of 75 gives an estimated figure for the size of the health inequalities pot, and also the allocation between PCTs.

- 4.14 ACRA favoured the additive approach as it is considered to be the most transparent and is regarded as giving a more appropriate weighting between the two formulas.

Weighting of the health inequalities and utilisation formulas

- 4.15 ACRA felt that a range of options could be considered in relation to the weights to be applied to a health inequalities formula. However, for illustrative purposes, ACRA considered the following options:
- applying the health inequalities formula to 10% of allocations;
 - applying the health inequalities formula to 15% of allocations;
 - applying the health inequalities formula to 20% of allocations.
- 4.16. However, due to lack of evidence, ACRA concluded that it is not currently possible to technically determine the cost of reducing health inequalities between PCTs in a way that could be used to inform allocations. Therefore, no technical way of assessing how much weight should be applied to the health inequalities formula compared to the utilisation formula, could be found. Ultimately, ACRA considered the weight to be applied to each formula to be a ministerial decision, based on the priority attached to reducing health inequalities rather than just responding to them.

Recommendation

That the weight to be given to the health inequalities formula should be a ministerial decision as no technical way of assessing how much weight should be applied to the health inequalities formula has been found.

Scope of services covered

- 4.17 ACRA has recommended that the health inequalities formula should be applied to all elements of the weighted capitation formula except mental health and HIV/AIDS. The rationale being that ACRA has recommended that the current mental health formula is retained and this already includes an adjustment for health inequalities.

Recommendation

That the health inequalities formula should be applied to all elements of the weighted capitation formula except mental health and HIV/AIDS.

Future work

- 4.18 The proposed health inequalities formula was seen by ACRA as an interim measure. Further work will be undertaken by ACRA to examine the issue of health inequalities for revenue allocations post 2010/11.
- 4.19 ACRA also acknowledged that the health inequalities formula will not in itself reduce health inequalities. The formula needs to be supported by performance management and monitoring of health inequalities.

Recommendation

That the health inequalities formula is an interim measure and that the issue of health inequalities and resource allocation should form part of ACRA's future work programme.

Section 5

Market Forces Factor

- 5.1 The Market Forces Factor (MFF) is used in both revenue allocations and Payment by Results (PbR) to compensate for unavoidable differences faced by NHS organisations in the costs of commissioning or providing healthcare throughout the country.
- 5.2 The MFF is used to:
- weight population shares within the weighted capitation formula;
 - calculate the reference costs index;
 - calculate the national tariff; and
 - reimburse providers for their unavoidable costs.
- 5.3 Two methods of estimating geographical cost variations are available, the Specific Cost Approach (SCA) and the General Labour Market (GLM) approach. The staff MFF has always been calculated on the basis of the GLM approach.
- 5.4 There are several criticisms of the current MFF and GLM approach:
- lack of methodological transparency;
 - the unfair impact of cliff edges on trust income;
 - a lack of direct and visible “connectedness” between the actual pay of NHS workers and the staff MFF; and
 - the range of the MFF from the lowest to the highest is felt to be too wide.

Rationale behind the MFF

- 5.5 As set out in *Review of the Specific Cost Approach to Staff Market Forces Factor* (Crystal Blue Consulting Ltd, 2008), economic theory underpins the current staff MFF. The theory predicts that it is more expensive to employ staff in some areas, notably London, than others. Competitive wages will rise or fall according to the cost of living, plus the cost of amenities in different geographical areas. (Amenities and disamenities reflect financial and non-financial differences, such as the cost of housing and attractiveness of location).

- 5.6 In terms of the NHS, where wages are determined by national pay structures, Trusts in areas with a low cost of living and low market wages (i.e. low MFF areas) will be paying above the going rate for staff, in contrast to Trusts in high cost/high wage areas (high MFF areas) which will be paying staff below the market rate.
- 5.7 The theory predicts that this asymmetry between NHS and general labour markets will lead low MFF areas to attract more staff of better quality, who will stay longer, reflecting better recruitment and retention conditions. The outcome is expected to be higher productivity and lower turnover associated with fewer vacancies. Conversely, the theory predicts that high MFF areas will attract a poorer quality workforce and experience greater difficulty in recruitment and retention, reflected in higher turnover rates, increased reliance on bank and agency staff and lower productivity. Economic theory also suggests that the NHS wages in high MFF areas will have a tendency to drift upwards (as employers strive to recruit) and be measurably higher for the same job than wages in low MFF areas.

Research

- 5.8 The MFF consists of three elements for staff, land and buildings. Other costs (equipment, consumables, drugs, etc) are assumed not to vary across the country. The staff MFF is the largest element.
- 5.9 In January 2006, ACRA commissioned two research projects to review the staff MFF. The first, led by the Health Economics Research Unit (HERU) reviewed the GLM method and proposed refinements. The second, led by Crystal Blue Consulting Ltd, explored the possibility of constructing a staff MFF adjustment on the basis of the SCA.
- 5.10 The objectives of the MFF review were to determine:
- whether there is a need for the MFF;
 - the approach to be used (GLM or SCA);
 - how to calculate the MFF;
 - whether the gradient of the MFF is too steep;
 - whether the cliff edges are too great;
 - whether the MFF is technically defensible;

- whether the MFF is easily explainable to the NHS; and
- the actual impact on PCTs and providers.

Criteria

- 5.11 When assessing the proposed changes from the review of the MFF, ACRA applied the essential and desirable criteria, as set out at Appendix 4.
- 5.12 In addition, the following quantitative criteria were viewed as important:
- the range or gradient of the MFF;
 - size of Trust cliff edges; and
 - the shift in target allocations, or level of “churn”.

Specific Cost Approach

- 5.13 The SCA method uses NHS data to try to identify the actual costs incurred by the NHS.
- 5.14 Earlier research into a SCA failed to pass the tests of practicality, technical robustness, reliability of calculation and freedom from perverse incentives, since it was regarded as virtually impossible to distinguish between those elevated costs which were avoidable, i.e. inefficiencies, and those which were unavoidable.
- 5.15 The study commissioned by ACRA represents the most detailed attempt to date to investigate the SCA in relation to an area cost adjustment in the NHS or government services generally.
- 5.16 The research brief was to study the size, variation and drivers in NHS unavoidable costs and their relationship to the current staff MFF by identifying:
- spatial variation in costs of providing services in different labour markets;
 - avoidable and unavoidable components of higher costs; and
 - the feasibility of implementing SCA as an alternative to the GLM method of calculating the staff MFF.

Specific Cost Approach versus General Labour Market Approach

- 5.17 The research into the SCA concluded that it is still appropriate to use a MFF to adjust PCT allocations for unavoidable cost differences, and that the current GLM approach, using private sector wage rates, is the right method for the MFF calculation. This is because there was insufficient data to pursue the SCA as an alternative approach. In addition, there are perverse incentives linked to the SCA.
- 5.18 ACRA also found the SCA research useful in that it demonstrated the direct (pay drift and agency usage) and indirect (low productivity, high turnover) costs associated with not paying the “going rate” in high cost labour markets.
- 5.19 The research also found that the MFF is barely understood in the NHS and lacks credibility. Evidence was provided that the impact of external labour market conditions on doctors was muted compared to other staff groups.
- 5.20 The final report on the SCA, *Review of the Specific Cost Approach to Staff Market Forces Factor* (Crystal Blue Consulting Ltd, 2008), can be found at www.dh.gov.uk/allocations

Recommendation

That there is still a requirement for a market forces factor component within the weighted capitation formula and that it should continue to be based on the GLM approach.

GLM Approach

- 5.21 The current staff MFF uses the GLM approach, which is based on variation in wages in the private sector. This is believed necessary in spite of national NHS pay arrangements because geographical variation in the labour market results in some NHS Trusts facing higher indirect staff costs due to recruitment and retention difficulties, grade drift and the use of agency staff.
- 5.22 The final report on the GLM approach, *Review of the Market Forces Factor Following the Introduction of Payment by Results (2005): Exploring the General Labour Market Method* (Health Economics Research Unit, 2008), can be found at www.dh.gov.uk/allocations.
- 5.23 Following the review of the GLM approach, ACRA has recommended a series of data updates and formula changes as set out below.

Data Updates

Use of ASHE Data

- 5.24 The current MFF was estimated from the Standardised Spatial Wage Differentials (SSWDs) which were calculated based on the 2001 to 2003 New Earnings Survey (NES) data.
- 5.25 ACRA has recommended updating the calculation of the MFFs using 2004 to 2006 Annual Survey of Hours and Earnings (ASHE) data. In addition, it was recommended that the SSWDs would be calculated using the new PCTs as the relevant geography. PCTs will generally have bigger sample sizes than Local Authority Districts (LADs). Calculating the SSWDs at PCT level removes the need for complex mapping between LADs and PCTs for smoothing and resource allocation. After smoothing there is little change in PCTs' target allocations as a result of the data update.
- 5.26 ACRA agreed that Welsh and Scottish labour market data be included in the estimates of the SSWDs for England and in smoothing options. This will increase the robustness of the estimates of SSWDs and the validity of smoothing (see 5.42 below).

Pooling the sample over three years

- 5.27 The new method pools data for the three years and it is run as a whole rather than by running the models separately for each year, and averaging the results, as in the current method. This results in each observation being given equal weight in the sample. In the current method, each year was equal, but as the sample sizes were not identical in each of the three years, each observation did not have the same weight. Pooling also creates a larger sample with the result of more accurate estimates, and reduces variation between updates.
- 5.28 ACRA recommended the pooling of the data as, although it has little impact overall on PCTs' MFFs, it should result in an improved statistical model that produces more robust results.

Formula Changes

Inclusion of part-time workers

- 5.29 Part-time workers were not previously included in the MFF calculations, as they were not well covered under the NES methodology. ASHE has a better coverage of part-time workers than the NES. It was decided to include part-

time workers in the modelling as they reflect a significant part of the general labour market and NHS workforce. As SSWDs are calculated on hourly wages, the impact of the inclusion of part-time workers at local level will depend on the relative characteristics of the local full-time employee and part-time employee markets as compared to the picture at the national level.

Recommendation

That part-time workers are included in the calculation of the MFF as they reflect a significant part of the general labour market and the NHS workforce.

Inclusion of City of London workers

- 5.30 The current MFF does not include observations for any workers who work in the geographical area of the City of London, as these workers were considered to be disconnected to NHS labour markets. This is because “City” jobs were believed to be different to other areas, even after standardising for industry and occupation.
- 5.31 The research into the GLM approach recommended including “City” workers to provide more robust estimates of wage differentials. The inclusion of the job responsibility adjustment (see below) also lessens the risk that like is not being compared with like.
- 5.32 ACRA discussed whether City of London workers had an impact upon the general labour market in London, which in turn impacted on NHS labour markets and costs. The consensus was that they did have a significant impact on the London economy, pushing up the cost of living, housing and labour market. Inclusion of “City” workers causes a substantial spike for the affected PCTs.
- 5.33 ACRA recommended that “City” workers should only be included if the effect is smoothed between other PCTs and spread out across other London PCTs. ACRA felt that there was no good reason to omit this group of workers, as they have an obvious influence on the London labour market and because we do not omit any other groups of workers.

Recommendation

That City of London workers are included in the calculation of wage differentials used to produce the MFF.

Job responsibility adjustment

- 5.34 ACRA has recommended a job responsibility adjustment is included in the MFF to take account of the impact of the size of firms and of managerial role on job responsibility. There will be greater managerial responsibility in areas with higher proportions of large firms, such as metropolitan areas. For example, a banker in central London is likely to have a different role than a banker in a different part of the country. The adjustment acknowledges the relationship between higher responsibility and higher wages. The result is reduced MFFs for those areas where there is higher responsibility as the corresponding higher wages will be adjusted downwards.
- 5.35 ACRA has recommended that the job responsibility adjustment should be at Government Office Region level rather than PCT level due to problems with the number of data observations at PCT level.

Recommendation

That a job responsibility adjustment is made to the MFF to recognise the fact that the same job titles reflect different jobs in different parts of the country.

Exclusion of doctors

- 5.36 Doctors were included in the calculation of the staff MFF for the first time in 2003/04.
- 5.37 Both the SCA and GLM research commissioned by ACRA has suggested that doctors are different from other NHS staff when looking at the difference in pay levels, vacancies, productivity and agency/locum spend in different parts of the country. Whilst there is a significant difference in the costs of employing nurses in the 20% of Trusts with the highest MFF compared to those with the lowest MFF, the same difference does not apply to doctors. There is evidence that productivity amongst doctors is lower in high MFF areas though this could be due to higher levels of teaching, training and research commitments.
- 5.38 ACRA felt that there was no evidence to support the inclusion of medical costs within the MFF and, therefore, recommended that they should be excluded from the calculation of the MFF. With additional evidence from consultation with the NHS that the MFF adjustment was “too steep”, ACRA has recommended that doctors are excluded from the staff MFF and that there is a separate index for doctors based on the London weighting. This

would reinstate the methodology that was applied in the calculation of target allocations up to 2002/03.

- 5.39 By excluding doctors, the impact on the MFF is primarily to re-weight the constituent components – the funding to which the staff MFF applies is reduced from 68% to 56.1%. The re-weighting results in dampening the impact of changes in the staff MFF on the overall MFF. The impact of removing doctors from the staff MFF reduces the allocation of all those PCTs with an MFF above one and increases it for all those with an MFF below one.

Recommendation

That the staff MFF is not applied to spend on doctors as their costs (for example, productivity and vacancy rates) do not vary differentially across the country as they do for other groups of workers.

Smoothing and Interpolation

- 5.40 A major issue with the MFF methodology is the “cliff edge” problem. This is when neighbouring PCTs receive markedly different MFFs because of arbitrarily drawn geographical boundaries. This is a problem if Trusts draw their staff from similar or high catchment areas that cross PCT boundaries.
- 5.41 ACRA has recommended exponential smoothing and interpolation to reduce “cliff edges”. ACRA considered the following criteria when selecting smoothing and interpolation that maintains a reasonable match with geographical patterns of unavoidable costs, and that reduces anomalous results between neighbouring Trusts:
- Range – the width of the range of MFFs before and after smoothing/interpolation;
 - Turbulence – how far the individual organisation values are moved by;
 - Cliff edges – the impact of cliff edges (between adjacent areas for smoothing and adjacent Trusts in different areas for interpolation);
 - Allocations – the impact of smoothing on current allocations.

Smoothing

- 5.42 In the current formula, raw SSWDs are smoothed to reduce artificial differences (“cliff edges”) between neighbouring PCTs. The research commissioned by ACRA recommended that smoothing should take into

account the MFFs of all PCTs rather than just the neighbouring ones as at present. Smoothing uses the attributes of the geographical areas close to a PCT to adjust the SSWD of the base PCT. The weights of the SSWDs of the surrounding areas are subject to an exponential distance decay function, which can be varied to change the overall aggressiveness of the smoothing. Smoothing will bring a PCT's MFF more in line with those of its neighbours. It also increases the sample size and confidence around the estimate and reduces instability.

- 5.43 ACRA has recommended exponential smoothing as this gives more emphasis to those areas in closer proximity than those further away. This is what would be expected if labour markets could be accurately observed.
- 5.44 Smoothing will negatively impact on those PCTs that are surrounded by PCTs with lower MFFs, and benefit those PCTs that are surrounded by PCTs with higher MFFs. This will primarily be evident in inner and outer London with inner London losing and outer London gaining.

Recommendation

That the "raw" MFFs, i.e. the differentials in pay rates, should be smoothed to reflect actual labour markets using a method that takes into account the distance from all other PCTs, not just neighbouring PCTs, to recognise the fact that NHS organisations in one PCT might draw their labour force from a variety of PCT areas.

Interpolation

- 5.45 Under PbR the MFF is paid directly to Trusts in respect of the activity they carry out. The MFF, therefore, has a direct impact on NHS Trust income.
- 5.46 The current approach to the MFF adjustment for PbR is to allocate an MFF to each Trust based on the area(s) in which the Trust is located (where Trusts have split sites across several areas they receive the weighted average of the host areas).
- 5.47 The issue of greatest concern to Trusts in relation to the MFF has been the apparent size of cliff edges between neighbouring Trusts. Therefore, a further refinement to smoothing called "interpolation" was explored. This involves a second stage smoothing carried out at Trust level, after smoothing at PCT level, to further reduce the impact of cliff edges.

- 5.48 Interpolation deals with the cliff edges between Trusts that straddle a PCT boundary. It works the same way as smoothing in that the MFF of a Trust is the weighted average of the surrounding PCTs' MFFs. The technical justification for interpolation after smoothing is that PCTs' MFFs are an area estimate. A Trust does not occupy an area but operates at a point(s) within the area. A Trust operating on the border of a PCT might have a higher or lower MFF than its host PCT depending on the MFFs of its neighbours. Interpolation uses the neighbouring PCTs' MFFs to better estimate the point average than the host PCT.
- 5.49 The overall impact is generally to reduce the MFF for central London providers to the benefit of Trusts in outer London.
- 5.50 After interpolation, the Trust level MFFs are passed through a purchaser provider matrix, as at present, to produce PCT MFFs which are weighted averages of the provider MFFs from which PCTs commission.

Recommendation

That provider-level MFFs should be additionally smoothed (“interpolated”) to reflect the distance of the provider site(s) from the centre of each PCT, rather than only taking the MFF of the PCT in which they are situated. This will help to reduce significant differences between the MFFs of some neighbouring providers.

Rurality

- 5.51 The MFF review demonstrated that labour costs in non-rural areas are significantly higher than in rural areas. It was also observed that hospital workers in rural areas, characterised by low turnover and low private sector wages, have higher productivity and better quality outcomes than those of densely populated urban areas.
- 5.52 The recommended MFF also includes a job responsibility adjustment that will help remove any bias in the calculation of SSWDs. It identified that seasonal workers did not impact on SSWDs.
- 5.53 ACRA, therefore, has recommended that no further adjustment is made for rurality on the basis of cost.

5.54 ACRA also considered options to update the Emergency Ambulance Cost Adjustment (EACA), which attempts to adjust for the cost differences of providing ambulance services in different areas. It was decided not to accept the updated adjustment for three reasons:

- data quality on ambulance costs is poor;
- the results of the study are counter intuitive; and
- better data will become available when ambulance services come under the tariff.

Recommendation

That no further adjustment is made for rurality.

Glossary of Terms

ACRA	Advisory Committee on Resource Allocation
ADFLE	Amenable Disability Free Life Expectancy
ADS	Attribution Dataset
AREA	Allocation of Resources to English Areas
ASHE	Annual Survey of Hours and Earnings
CARAN	Combining Age Related and Additional Needs
DFLE	Disability Free Life Expectancy
DH	Department of Health
EACA	Emergency Ambulance Cost Adjustment
ELDA	English Language Difficulty Adjustment
EU	European Union
GLM	General Labour Market
GMS	General Medical Services
GP	General Practitioner
HA	Health Authority
HCHS	Hospital and Community Health Services
HERU	Health Economics Research Unit
HES	Hospital Episode Statistics
HIV/AIDS	Human Immuno-Deficiency Virus/Acquired Immuno-Deficiency Syndrome
HSE	Health Survey for England
LADs	Local Authority Districts
LE	Life Expectancy
MFF	Market Forces Factor
MSOA	Middle-level Super Output Area

NES	New Earnings Survey
NHAIS	National Health Applications and Infrastructure Services
NHS	National Health Service
NICE	National Institute for Clinical Excellence
ONS	Office for National Statistics
PbR	Payment by Results
PCT	Primary Care Trust
QALY	Quality Adjusted Life Year
QOF	Quality and Outcomes Framework
RARP	Resource Allocation Research Paper
SCA	Specific Cost Approach
SSWD	Standardised Spatial Wage Differentials
SYLL	Standardised Years of Life Lost
TAG	Technical Advisory Group

Appendix 1

Advisory Committee on Resource Allocation

The Advisory Committee on Resource Allocation (ACRA) was established in September 1997 as the successor body to the Resource Allocation Group (RAG).

Role

ACRA's role is to oversee the development of the weighted capitation formula used to inform revenue allocations to Primary Care Trusts (PCTs), to ensure equity in resource allocation.

Membership

ACRA is an independent expert body whose membership is made up of individuals with a wide range of relevant experience and expertise from within, and outside, the National Health Service (NHS). Details of ACRA's membership are shown at Appendix 2. A Technical Advisory Group (TAG) provides technical support to ACRA. Details of TAG's membership are shown at Appendix 3.

Terms of reference

ACRA's terms of reference are:

- (a) to advise the Secretary of State for Health on the distribution of resources across primary and secondary care, in support of the goal of equitable access to healthcare for all;
- (b) to develop and apply methods which are as objective and needs-based as available data and techniques permit.

Objectives

ACRA's objectives are to develop a funding formula for revenue allocations that:

- (a) ensures equal opportunity of access to health care for people at equal risk; and
- (b) contributes to the reduction in avoidable health inequalities.

Additionally, any estimates of unmet need used to adjust target allocations should be justifiable to the academic community and to the lay NHS audience.

Appendix 2

Membership of Advisory Committee on Resource Allocation

Chair

Mr David Fillingham Chief Executive, Bolton Hospitals NHS Trust

Members

Professor Gwyn Bevan (joined ACRA May 2007 also a TAG member)	Professor of Management Science, London School of Economics and Political Science
Mr Martin Campbell (joined ACRA Sept 2006)	Department of Health, Finance
Mr Michael Chaplin (joined ACRA Feb 2008)	Department of Health, Economic Adviser
Mr Keith Derbyshire	Department of Health, Senior Economic Adviser
Mr Francis Dickinson (left ACRA Feb 2008)	Department of Health, Economic Adviser
Professor Ian Diamond	Chief Executive, Economic and Social Research Council
Dr Stewart Drage	General Practitioners Committee, British Medical Association
Dr Mike D'Souza	General Practitioner
Dr Patrick Geoghegan OBE (joined ACRA July 2007)	Chief Executive, South Essex Partnership NHS Foundation Trust
Professor Howard Glennerster	Emeritus Professor of Social Policy, London School of Economics
Professor Hugh Gravelle (joined ACRA May 2007)	Professor of Economics, Centre for Health Economics, University of York
Ms Sarah Horne (left ACRA Sept 2007)	Economic Adviser, Communities and Local Government
Mr Chris Hurst (former TAG member joined ACRA May 2007)	Director of Finance, Oxford Radcliffe Hospitals NHS Trust

Dr Ruth Hussey	North West Regional Director of Public Health
Professor Sir Brian Jarman	Emeritus Professor, Imperial College, Faculty of Medicine
Professor Martin Knapp (joined ACRA July 2007)	Professor of Social Policy, London School of Economics and Political Science, and Professor of Health Economics, Institute of Psychiatry, King's College, London
Mr Paul Lilley (left ACRA Aug 2007)	Chief Executive, Gloucestershire Hospitals NHS Foundation Trust
Ms Rhona MacDonald	Chief Executive, Bath and North East Somerset Primary Care Trust
Mrs Candy Morris (joined ACRA May 2006)	Chief Executive, South East Coast Strategic Health Authority
Mrs Katy Peters (joined ACRA Sept 2007)	Department of Health, Head of Practice Based Commissioning & Strategy
Professor Phil Rees (joined ACRA January 2007)	Professor of Population Geography, School of Geography, University of Leeds
Dr Nigel Rice ²	Reader, Centre for Health Economics, University of York
Mr David Roberts	Programme Head – Non-Acute Care, The NHS Information Centre for Health & Social Care
Dr Ian Rutter (joined ACRA Sept 2006)	Department of Health, Practice Based Commissioning
Dr Colin Sanderson (joined ACRA May 2007) also a TAG member)	Reader in Health Services Research, London School of Hygiene and Tropical Medicine
Mr Jan Sobieraj (joined ACRA Feb 2008)	Chief Executive, Sheffield Primary Care Trust
Dr Ian Trimble	General Practitioner and Chair, Professional Executive Committee, Nottingham City Primary Care Trust
Mr Carl Vincent (left ACRA Sept 2006)	Department of Health, Finance

² Dr Nigel Rice stepped down from ACRA and TAG in January 2007 for the duration of the research project on need. He re-joined ACRA and TAG in February 2008.

Mrs Sarah Wyatt
(joined ACRA Sept 2007)

Statistician, Communities and
Local Government

Secretariat

Miss Sally Chapman

Department of Health, Finance

Miss Berni Dolan

Department of Health, Finance

Miss Lorraine Middlemas
(left ACRA Dec 2007)

Department of Health, Finance

Appendix 3

Membership of Technical Advisory Group

Chair

Ms Rhona MacDonald
Chief Executive, Bath & North East Somerset Primary Care Trust

Members

Prof Gwyn Bevan
Professor of Management Science, London School of Economics and Political Science

Ms J Bowman
(left TAG May 2006)
Office for National Statistics, Centre for Demography

Mr Paul Brickwood
(joined TAG Nov 2005)
Director of Finance and Commissioning, Knowsley Primary Care Trust

Mr Martin Butcher
(left TAG Sept 2007)
Director of Finance and Risk Management, Northamptonshire Heartlands Primary Care Trust

Mr Martin Campbell
(joined TAG Sept 2006)
Department of Health, Finance

Mr Michael Chaplin
(joined TAG Feb 2008)
Department of Health, Economic Adviser

Mr Steve Clarke
(joined TAG June 2007)
Director of Finance, NHS East of England

Mr Keith Derbyshire
Department of Health, Senior Economic Adviser

Mr Francis Dickinson
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Mr Jon Ford
Head of Health Policy and Economic Research, British Medical Association

Dr Peter Goldblatt
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Office for National Statistics, Centre for Demography

Mr Tom Hennell
Senior Analyst, North West Public Health Group, Government Office for the North West

Mr Chris Hurst
(left TAG May 2007)
Director of Finance, Oxford Radcliffe Hospitals NHS Trust

Dr Sarah Jarvis (left TAG Feb 2006)	General Practitioner, Medical Practices Committee
Ms Uzma Khan (left TAG May 2006)	Scottish Office, Economic Adviser
Mrs Mary Leadbeater	Finance Director, Royal Free Hampstead NHS Trust
Mr Andy Leary	Director of Finance, NHS Professionals
Mr David Lloyd	Applied Statistician, Prescribing Support Unit, Information Centre for Health and Social Care
Mr Keith Mackenzie (joined TAG May 2006)	Scottish Government, Economic Adviser
Mr Chris Raspin (joined TAG June 2007)	Development Manager, Audit Commission
Mr David Reynolds	Assistant Director of Finance, Newcastle-upon- Tyne Hospitals Foundation Trust
Dr Nigel Rice ³	Reader, Centre for Health Economics, University of York
Ms Eileen Robertson	Department of Health, Economic Adviser
Mr David Rose (joined TAG June 2007)	Chief Executive, Warwickshire Primary Care Trust
Dr Colin Sanderson	Reader in Health Services Research, London School of Hygiene & Tropical Medicine
Mr Carl Vincent (left TAG Sept 2006)	Department of Health, Finance
Prof Margaret Whitehead	Professor of Public Health, University of Liverpool
Prof Frank Windmeijer (joined TAG June 2007)	Professor of Econometrics, University of Bristol

Secretariat

Miss Sally Chapman	Department of Health, Finance
Mr Karl Payne	Department of Health, Finance
Miss Lorraine Middlemas (left TAG Dec 2007)	Department of Health, Finance

³ Dr Nigel Rice stepped down from ACRA and TAG in January 2007 for the duration of the research project on need. He re-joined ACRA and TAG in February 2008.

Appendix 4

Evaluation Criteria for Resource Allocation Formulas

The following list sets out the basic criteria agreed by ACRA for evaluating resource allocation formulas.

The essential and desirable criteria are set out in the table below, followed by an explanation of what is meant by each criteria.

<i>Essential</i>	<i>Desirable</i>
Technical robustness	Comprehensibility to non-specialists
Transparency	Durability
Objectivity	Practicality
Plausibility	Clarity of contribution of indicators
Freedom from perverse incentives	Flexibility
Reliability of calculation	Stability
	Materiality

Essential Criteria

Technical robustness

1. The analytical techniques used to develop the formula should have an established academic pedigree, and should be evidence-based and used in accordance with proper practices in relation to those techniques.

Transparency

2. In general, the formula should be simple to understand although the detail may be more complex. Analytical techniques should normally be capable of objective quality assessment, such as is provided by tests of statistical significance. Ideally, although this is difficult to quantify, the outcome of the process should command a wide degree of acceptance, i.e. 'felt to be fair' on the ground.

Objectivity

3. The formula should be objective and capable of application consistently to all PCTs.

Plausibility

4. The plausibility of the relationships defined by the formula should be capable of reasoned and unambiguous explanation.

Freedom from perverse incentives

5. The formula should not create financial incentives which appear to conflict with the sensible operation of PCT services.

Reliability of calculation

6. The formula should use data whose quality is sound, is consistent between PCTs, and is available for all PCTs.

Desirable Criteria

Comprehensibility to non-specialists

7. The formula, and the means by which it has been arrived at, should be capable of common sense justification to non-specialists. This means that the substantive effect of analytical techniques should be capable of explanation in plain English, even if the process of calculation is understood only by specialists.

Durability

8. There should be reasonable grounds for expecting that the influence of an indicator on the need for PCT services or the cost of providing them will continue for some years.

Practicality

9. The scale of work required to derive or update a formula should be manageable within the time constraints of the annual financial cycle.

Clarity of contribution of indicators

10. It is desirable that the relative significance of individual indicators can be quantified unambiguously.

Flexibility

11. It should be possible for the formula to take account of future changes of PCT responsibilities or structure (e.g. reorganisation or boundary changes).

Stability

12. Fluctuations in the formula arising from fluctuations in data for indicators should be well-founded, rather than a side-effect of limitations in the quality of those data.

Materiality

13. The extra technical complexity of the proposed change to the formula must be set against the overall share of total expenditure involved, and its impact on overall weighted populations.

Appendix 5

Resource Allocation – Final Research Reports

<i>Full Title</i>	<i>Date of Publication</i>	<i>Authors</i>
Review of the Specific Cost Approach to Staff Market Forces Factor (RARP 31)	December 2008	Crystal Blue Consulting Ltd
Review of the Market Forces Factor Following the Introduction of Payment by Results (2005): Exploring the General Labour Market Method (RARP 32)	December 2008	Health Economics Research Unit
Review of Population Base for PCT Revenue Allocations Post 2007/08 (RARP 29)	December 2008	Information Centre for Health and Social Care
Combining Age Related and Additional Needs (CARAN) Report (RARP 30)	December 2008	Brunel University
Review of the Weighted Capitation Formula (RARP 33)	December 2008	Professor Gwyn Bevan
Allocation of Resources to English Areas (AREA) Report (RARP 26)	December 2002	Sutton et al
Assessment of the Costs to the NHS Arising from the Need for Interpreter, Advocacy and Translation (RARP20)	1998	University of Warwick

All the above reports can be accessed via: www.dh.gov.uk/allocations



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