A BRIEF HISTORY OF RESOURCE ALLOCATION IN THE NHS 1948-98

Purpose

1. This paper is for information only and aims to provide some background information on the development of resource allocation mechanisms in the NHS over the past 50 years. The main intention of the paper is to place the recently announced 'wide ranging review' of the national allocations formula in its historical context. The paper, hopefully, will also help stimulate discussion concerning how ACRA takes forward the 'wide ranging review' of the formula.

2. This paper will highlight landmark developments, key issues and the major controversies that have characterised the evolution of resource allocation in the NHS. The paper begins with a discussion of resource allocation from 1948-1971.

HCHS Resource Allocation 1948-1971

3. The overarching policy aim in introducing the NHS was to secure equal access to comprehensive medical care for every individual across the country regardless of their ability to pay. The prime consideration of the founders of the NHS was thus to remove the financial constraints on access to health services. There was not, however, an explicit statement of the principles and methods that were to be used to distribute the available financial resources across the country.

4. In 1948, local Government in Britain handed over the running of 1771 hospitals with 427000 beds to the NHS. The voluntary hospital bodies handed over 1334 hospitals with 117000 beds. There was, however, a very uneven spread of hospitals and therefore service provision across the country - largely reflecting the pattern of hospital build inherited from the previous century. The most important point is that the foundation of the NHS was characterised by a lack of co-ordination and large geographical differences in the distribution of beds. Revenue expenditure was allocated, as it had to be initially, to pay for these beds, and for the doctors and nurses in the hospitals taken over.

5. Another key issue here is that the pattern of resource distribution to different Regional Hospital Boards (and then to local hospitals) across the country was not explicitly linked to the relative need (medical, social or economic) for resources. Revenue for the hospital service was therefore distributed to the institutions providing services through a system of incremental budgeting which perpetuated the geographical unequal distribution of beds, staff and finance inherited by the NHS in 1948. This resource allocation system has been described somewhat cynically as: 'What you got last year, plus an allowance for growth, plus an allowance for scandals'.

6. The 1962 Hospital Plan outlined a capital programme to help reduce regional inequalities, but by 1966 this ambitious plan was downgraded because of financial constraints. Nonetheless this policy initiative helped to stimulate
academic interest in the geographical inequities in resource allocation, and by the late 1960s the then Minister of Health (Richard Crossman), was stating that the principal problem facing the health service was inequality in the regional (i.e. geographical) distribution of health care resources.

7. The stage was firmly being set for an attempt to put the geographic allocation of resources on a more rational basis. In particular, Crossman's personal advisors and senior officials were recommending a population based formula for resource allocation. The 1970 Labour Government's Green Paper on NHS re-organisation included a commitment to a new method of resource allocation. The basic determinant of the new geographically based HAs budget should be: "... the population served by the Area, modified to take account of relevant demographic variables, underlying differences in morbidity... ". This led to the development of the so-called "Crossman Formula", a landmark development in the history of resource allocation in the NHS.

The Crossman Formula 1971-1975

8. In 1971/2 a formula based on objective criteria was introduced to guide the distribution of HCHS revenue resources. The "Crossman formula" (although it was actually implemented by the then Conservative Government) was directly aimed at removing Regional inequalities in the hospital service within a measurable time (ten years). In summary, the "Crossman formula" derived each Regional Health Board's 'target' allocation towards which its actual allocations were gradually to move (as in later RAWP) from three elements:

(a) Population - weighted by the national bed occupancy rate for different age and sex groups and adjusted for patient flows;

(b) Beds - in each speciality weighted by the national average cost per bed per year;

(c) Cases - inpatient, outpatient and day cases weighted by the national average cost per case.

9. Thus the Crossman formula represented a compromise between population indicators of need and the maintenance of the existing pattern of provision. Other features of the new approach worth noting are:

(a) no explicit overriding principle of resource allocation - for example 'equal opportunity of access for equal need';

(b) for the first time: transparent/explicit/objective criteria used for resource allocation;

(c) judgement still played a part - the population factor was given an arbitrary double weight so that the relative contribution to the 'target' of the three elements was: population, 0.5, beds and cases 0.25 respectively;

(d) morbidity and socio-economic factors absent from the formula;
(e) formula related to HCHS only - no attempt to incorporate GMS or local authority services;

(f) an explicit pace-of-change policy - targets to be reached over a ten year period;

(g) no related mechanism to ensure that finance was spent in a specified manner - ie formula concerned with means not ends.

The RAWP Formula 1976-1989

10. A major criticism of the "Crossman formula" was that it was arbitrary and not sufficiently based on need. Partly in response to these criticisms and the added impetus given by the 1974 NHS reorganisation (which created for the first time an administrative tier (AHA) with statutory responsibility for service delivery to a specific geographical population), the then Department of Health and Social Security (DHSS) in England set up the Resource Allocation Working Party (RAWP). RAWP was set up, "...with a view to establishing a pattern of distribution responsive objectively, equitably and efficiently to relative need and to make recommendations".

11. RAWP interpreted the underlying objective of resource allocation to be 'equal opportunity of access to health care for people at equal risk'. The formula, therefore, had to be constructed in such a way as not to reflect the past pattern of supply and demand for health services, but the relative needs of different regional populations for health care resources.

12. RAWP also recognised that 'need' for health care (over and above age) could not be measured directly and argued that the most appropriate proxy was population morbidity. RAWP surveyed the routinely available data for as direct a proxy measure of morbidity as possible which could be readily updated and straightforwardly related to NHS administrative structures. The chosen proxy was standardised mortality rates (SMRs) for males and females. RAWP further assumed a 1:1 relation between SMRs and the need for resources.

13. As well as variation in health need RAWP also argued that 'equal opportunity of access for equal need' needed to take account of local variations in market forces factors ie a given amount of money buys different amounts of equal quality health care across the country - (ACRA(98)07 discusses in detail the historical development of the Market Forces Factor).

14. In summary, RAWP recommended distributing financial resources on the basis of population, weighted according to the need for healthcare and the unavoidable cost of providing healthcare services. RAWP therefore established the principle of a weighted capitation formula - an approach which has been used ever since. The most salient features of the RAWP approach are summarised as:
now an explicit overriding principle of resource allocation - 'equal opportunity of access for equal need', but this did not include any mechanism actively to secure equal opportunity of access;

(b) transparent/explicit/objective criteria used for resource allocation;

(c) judgement still played a part - SMR the proxy for need with a 1:1 weighting;

(d) morbidity and socio-economic factors absent from the formula;

(e) formula related to HCHS target allocations only - no attempt to incorporate GMS or local authority services;

(f) geographical equity only - rather than tackling the more controversial social class inequalities in health and health care utilisation;

(g) no related mechanism to ensure that finance was spent in a specified manner - ie formula concerned with financial equity, rather than planning/clinical outcomes.

The Review of RAWP (RofR) 1989-1994

15. Even though the general principle of weighted capitation was widely accepted (both within and outside the NHS), the RAWP formula came in for criticism. In particular, the way the formula estimated the relative needs (over and above age) of populations. Three issues in particular exercised the critics of RAWP:

(a) that SMRs were not good proxies for morbidity;

(b) that SMRs failed to pick up the full resource consequences associated with social and economic deprivation;

(c) that there was no empirical basis for the assumed 1:1 relation between SMR and variations in need for health care resources.

16. Partly in response to these criticisms, and as Regions moved closer to their targets, it was believed that the formula had to be 'fine tuned'. So in 1985 the NHS Management Board was asked to review the operation of the RAWP formula. In announcing the review, the Secretary of State made it clear that "the underlying principle of RAWP, that of securing equal opportunity of access to health care for people in equal need, is not in question...However, the review will look at the scope for improving the measurement of need".

17. The formula was to be evaluated and - if necessary - changed according to two basic principles: first, that no change should be made to the formula unless clearly justified; and second, that the formula should remain as stable, robust and as simple and straightforward as perceived "fairness" permitted for national purposes.

Technical Innovations
18. The most important technical innovation proposed by the RoR team was to base the assessment of 'need' (over and above age) upon a small area (1981 Census) regression analysis of the determinants of variations in hospital utilisation adjusted for the supply of facilities accessible to small areas. On the basis of their preferred model, the review team recommended: (i) replacing all-age SMR with SMR<75 together with a reduction of the weighting given to SMR in the formula from 1.0 to 0.44 (ii) the inclusion of an explicit social deprivation factor - the Jarman deprivation score. Both variables were to be weighted in accordance with their estimated coefficients from the regression analysis.

19. In the event, this entirely empirical solution was tempered by judgments as Ministers opted for weighting SMR with an elasticity of 0.5 (equivalent to the square root of SMR) and chose not to include the Jarman deprivation score. The introduction of this new formula was announced with the publication of Working for Patients (1989). Nonetheless, the most important development associated with the RoR was the significant shift away from informed judgment to a more empirical approach to the identification and weighting of 'need' indicators, with the aim of making the formula more 'sensitive to need'. The RoR team recommended that the small area analysis should be repeated when data from the 1991 Census became available.

20. Inevitably the RoR came in for criticisms itself. Three particular criticisms stood out:

(a) its conceptualisation of need - in particular the reliance on utilisation data and inappropriate/insufficient adjustment of supply effects;

(b) the adequacy of the database used - data from only six out of the possible 14 Regions was used, this raised questions about the adequacy and representativeness of the dataset used;

(c) appropriateness of the statistical methods used - in particular the inappropriateness of using simple linear regression techniques in circumstances where, it could be argued, demand (need) and supply were simultaneously determined. This would lead to biased and inconsistent results.

Review of Weighted Capitation 1994-1998

21. In February 1993 Ministers announced their intention to review the current system of weighted capitation. The ostensible justification for another review so soon after the implementation of the revised formula in 1990-1991 was the availability of new data from the 1991 census. Once again, the primary purpose of the review was to improve the sensitivity of the current formula - for allocating HCHS resources to the Regional Health Authorities. A team from York University was contracted to carry out the technical work.

22. The York team adopted a broadly similar approach to that used in the RoR, ie 'additional need' (over and above demographics) was modelled against small
area\textsuperscript{10} census based data, where the relative importance of the proxies for health determinants is again established empirically. In short, the combination of variables which best predicts past (national average) utilisation, after adjusting for supply, is used to determine an index of relative need - under the assumption that such variables will also predict the future use/need for services. The other fundamental assumptions behind the utilisation approach are that:

(a) utilisation reflects true population health needs or unmet need is proportional to met need;

(b) any elements of need not captured by the variables in the formula is not systematically higher or lower in certain wards;

(c) that the 'national average' relationships are robust predictors of need in different parts of the country and in different (rural/urban) environments.

23. The most significant change was the replacement of SMR as the sole proxy for morbidity, and therefore need (over and above age) with two separate needs indices for acute and psychiatric services. This work done by the York team is widely acknowledged by independent expert opinion to be the most impressive and sophisticated technical analysis undertaken so far\textsuperscript{11}.

24. The York approach, however, has not gone without criticism:

(a) the analysis is still based on (inpatient) utilisation. Any use, and, therefore, need which is not revealed through inpatient use is ignored;

(b) the implicit assumption in their work is that the existing national allocation of resources between care groups (as revealed in inpatient utilisation) is appropriate;

(c) the analysis (except for SMR data) were limited to the social variables available in the 1991 census, these data may date rapidly, and may also suffer from incomplete enumeration;

(d) the census data relates to small area geographies and the circumstances of an individual may not be typical of the area in which they live - this leads to 'problems of attribution' and gives rise to the 'ecological fallacy' - under which associations observed at an area level are wrongly inferred to exist at the individual level;

(e) the analysis yields models which amounts to the national average response to needs, there is a question over whether the models may be sustained at lower levels of aggregation - for example predicting practice needs.

25. The York model was originally intended to help guide allocations to the 14 Regional Health Authorities (RHAs). Before it was implemented, RHAs were abolished and the formula has been used since 1996/97 for determining target allocations for 100 HAs. Indeed, with the advent of the newNHS the national model is being used to set target allocations to approximately 500 PCGs.
Ministers have recognised that there have been growing concerns about how well the existing formula matches need at PCG level. Triggered by this concern, Ministers announced in November 1998 ‘a wide ranging review’ of the formula used to make allocations to HAs and PCGs. The aim of the review is to produce a fairer formula more suitable for the newNHS. The existing formula will be frozen, other than routine data changes, until at least 2001/02.

**Conclusion**

26. This paper has attempted to place the recently announced wide ranging review of the national allocations formula in its historical context. The paper, hopefully, will also help inform/stimulate discussion concerning how ACRA takes forward the wide ranging review of the formula.
Notes


4. see for example P.A. West (1973) Allocation and equity in the public sector: the Hospital Revenue Allocation Formula’ Applied Economics 5


6. The new weighted capitation formula was first used to set targets for 1990-91 RHA allocations

7. The 1991 Census not only provided new information on the population and social characteristics of small areas, but also included for the first time a direct question on morbidity, ie self-reported Limiting Long Standing Illness (LLSI).


10. For example, the unit of analysis used in the York study were 4985 "synthetic wards", small areas with average populations of around 10,000 covering the whole of England.

11. see for example, (i) evidence given by Dr Ken Judge to House of Commons Health Committee 'Public Expenditure/Resource Allocation' Minutes of Evidence 22 June 1995 (ii) N. Mays International Journal of Epidemiology 1995