**De Minimis Costs of Healthcare Services in the NRAC Formula**

**Paper TAGRA(2013)11**

1. This note describes how de minimis costs (or quasi fixed costs) of healthcare services are captured in the NRAC formula.
2. The fundamental point is that the costs of healthcare services, including staff and overheads, are included in the calculation of the average unit costs of patient treatment. These average unit costs (by data zone) are the basis of the Unavoidable Excess Costs Adjustment (UECA) element of the formula.
3. This note provides a brief description of the UECA. It then considers the derivation of hospital unit costs, which are the focus of the interest in de minimis. It includes a simple numerical example to demonstrate the way in which costs feed through to the UECA, and how the UECA and board target shares adjust to changes in costs.

**Unavoidable Excess Cost Adjustment – background**

1. The unavoidable excess cost of supply adjustment is intended to account for variation in the cost of delivering health services in different urban-rural geographies. It is defined as a pure unit cost effect, separate from any expenditure variation generated by differences in case-mix and length of stay etc. These latter are captured by the additional needs adjustment in the morbidity and life circumstances element of the formula. The adjustment is estimated for each of the Urban-Rural Categories (URC) and each data zone within a URC will have the same value.
2. There are four elements within the unavoidable excess cost adjustment: hospital services; clinic-based community services; travel-based community services; and, prescribing. An overview of each these elements is provided in Annex 1. However, as the issue of de minimis costs is raised in relation to hospital services – this note will focus on the excess cost adjustment for hospital services.
3. There are two main parts to the ECA method for hospital services: first, the calculation of the cost ratios at the data zone level; second, the estimation of the average cost ratios for the urban/rural categories. Again, as the issue under consideration is whether de minimis costs are captured in the formula the rest of the note will focus on the calculation of the cost ratios.

**Unavoidable Excess Cost Adjustment – calculating local cost ratios:**

1. The hospital UECA compares the actual costs of treating patients in a data zone with the cost of treating them had the unit costs of care been national average unit costs (rather than the actual costs). That is, it calculates the ratio of actual treatment costs to national average costs (at the speciality level)[[1]](#footnote-1). Details of the cost ratio calculation approach from NRAC Technical Report E are presented in Annex 2 for reference.
2. The specific data used for the hospital costs ratio combines activity data (SMR) with the speciality level cost data in SFR 5.2. Thus the unit costs will encompass all the costs[[2]](#footnote-2) of treating patients at a board including the fixed costs of the board and the hospital – which are allocated to patient treatment services.
3. The basic expenditure source used for the calculation of costs is the Costs Book. See the following link to the Costs Book Manual (and reconciliation to the Annual Accounts) for definitions of the cost data. <http://www.isdscotland.org/Health-Topics/Finance/Costs/Reference-Information.asp>
4. A board which had to maintain a large hospital or number of hospital beds or hospital staff, relative to its number of patients (because it had a small population), will have a high average cost per patient. That is, it will have a high cost per patient compared to the national average cost – and this will be captured as high cost ratio.
5. In practice there are cross (health board) border transfers of patients and the ECA average cost of treating the patients in a data zone reflects this: it is the cost of treatment for data zone residents irrespective of where the treatment occurs. The cost ratio for the data zone will reflect an average of the costs of the board of residence for patients treated in the home board and the costs of the board of treatment for patients treated in another board.
6. That ensures that the estimated cost ratio reflects the average cost to the board of treating its resident population, ceteris paribus. Note that the methodology for estimating the unit costs of hospital treatment is under review as part of TAGRA’s work programme.

**Unavoidable Excess Cost Adjustment – a numerical example:**

1. In this section we use a worked example to demonstrate how the UECA reflects differences in costs. For transparency we use a simple model which assumes:

* there are two boards (Remote and Central);
* the characteristics of Central are generally 10 times larger those of Remote, but the hospital costs are only 5 times that of Remote;
* each board has one hospital;
* hospital costs are fixed;
* there is only one type of patient (inpatient);
* speciality differences are ignored.

1. There are two scenarios: first, the remote board treats all its own residents; second, the remote board sends patients to the central board for treatment. Crucially in both cases the hospital costs are the same (i.e. they are all fixed or de minimis). The tables show how the UECA will reflect the average costs of treatment in both cases.

Scenario 1: Remote Board Treats All Resident Patients

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Remote Board | | Central Board | | | RB+CB  (= "Scotland") | |
|  | RGH | Board Total | CGH (CB residents) | CGH (RB residents) | Board Total | Total | Ave. |
| Health board residents |  | 30,000 |  |  | 300,000 | 330,000 |  |
| Board inpatient episode by board of residence |  | 4,000 |  |  | 40,000 |  |  |
| Board inpatient episode treated by hospital & HB of treatment | 4,000 | 4,000 | 40,000 | 0 | 40,000 | 44,000 |  |
| Total hospital treatment costs (£ 000) | 25,000 | 25,000 | 100,000 | 0 | 125,000 | 150,000 |  |
| Net board costs (£ 000) |  | 25,000 |  |  | 125,000 |  |  |
| Unit cost of treatment episode (£ 000 ) | 6.25 | 6.25 |  |  | 3.13 |  | 3.41 |
| Ratio of cost – local to national (UEC) |  | 1.83 |  |  | 0.92 |  |  |
| Weighted population |  | 55,000 |  |  | 275,000 | 330,000 |  |
| Target share |  | 17% |  |  | 83% |  |  |
| Implied funding (£ 000) |  | 25,000 |  |  | 125,000 | 150,000 |  |

Scenario 2: Remote Board Sends Patients to Central Board

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Remote Board | | Central Board | | | RB+CB  (= "Scotland") | |
|  | RGH | Board Total | CGH (CB residents) | CGH (RB residents) | Board Total | Total | Ave. |
| Health board residents |  | 30,000 |  |  | 300,000 | 330,000 |  |
| Board inpatient episode by board of residence |  | 4,000 |  |  | 40,000 |  |  |
| Board inpatient episode treated by hospital & HB of treatment | 2,000 | 2,000 | 40,000 | 2,000 | 42,000 | 44,000 |  |
| Total hospital treatment costs (£ 000) | 25,000 | 25,000 | 119,048 | 5,952 | 125,000 | 150,000 |  |
| Net board costs (£ 000) |  | 30,952 |  |  | 119,048 | 150,000 |  |
| Unit cost of treatment episode (£ 000 ) | 12.50 | 7.74 | 2.98 | 2.98 | 2.98 |  | 3.41 |
| Ratio of cost – local to national (UEC) |  | 2.27 |  |  | 0.87 |  |  |
| Weighted population |  | 68,095 |  |  | 261,905 | 330,000 |  |
| Target share |  | 21% |  |  | 79% |  |  |
| Implied funding (£ 000) |  | 30,952 |  |  | 119,048 | 150,000 |  |

1. In scenario 2 half of the patients in the remote board are transferred to the central board for treatment. As all hospital costs are fixed this means that the average unit costs of treatment in remote board are higher than (double) the unit costs in scenario 1 (and the average unit costs in central board are lower). The remote board must also reimburse the central board for the costs of treating remote board residents.
2. The overall costs to the remote board are therefore higher than in scenario 1. Note, however, costs of treating all its residents does not double as this is the (patient) weighted average of its own and central board average costs.
3. The key point is that in both cases the costs of treating residents feeds through the UECA to the population weights and thus into board target shares. The target shares are thus commensurate with the board costs.

**Annex 1: Overview of the Unavoidable Excess Costs Adjustment**

1. The four elements within the unavoidable excess cost adjustment are described below.

**Hospital Services:**

1. The excess cost for hospital services is the cost ratio of local to national unit costs calculated at the datazone level. Specifically it is the ratio of the cost of providing the required local services at local unit costs to the (notional) cost of providing those local services estimated at national unit costs. Unit costs are calculated as the average cost per episode, or length of stay, (separately by inpatient/daycase/outpatient) by speciality for the population of the data zone. Note that the denominator in this ratio is the numerator of the ratio used to calculate the morbidity and life circumstances adjustment.
2. This calculation is undertaken for each of the individual the care programmes: Acute, Care of the Elderly, Mental Health and Learning Difficulties, and Maternity.

**Travel-based Community Services:**

1. The estimate of the variation in the cost of travel-based community services is based on a travel simulation model which assumes that professionals are based in settlements and must travel to patient’s homes. The model is based on census output areas data (around 42,000 output areas) and data on the drive time to ‘small’ settlements (3,000 plus people) or ‘large’ settlements (10,000 people). It includes assumptions about contact duration, setup time, island contact time, base location and proportion of home visits.
2. The estimated time consumption is equal to:

% home visits \* (setup time + contact duration + driving time) + % non-home visits \* (setup time + contact duration)

1. The ratio of the data zone to the Scotland average is calculated for each community service and aggregated for the data zone using service expenditure shares. The key determinant of the excess cost adjustment is the settlement size.

**Clinic-based Community Services:**

1. The adjustment for clinic-based services is taken from the Scottish Allocation Formula (SAF) for General Medical Services’ practice weighting for remote and rural areas. The SAF weighting uses three practice variables: population density (number of hectares per resident); population sparsity (population in communities of less than 500); road mileage payments (proportion of people which attract road mileage payments). The SAF weightings are mapped from GP practices to data zones and the excess cost adjustment reflects the ratio of individual data zone’s weighting to the national average. The overall community excess cost adjustment assumes that the community services are split 2/3 to 1/3 between travel-based and clinic-based services respectively.

**GP prescribing:**

1. The excess cost adjustment relating to GP prescribing is set to 1 across all geographies as a national reimbursement rate applies for all drug prescriptions and dispensing costs are not covered by the resource allocation formula.

**Aggregation:**

1. The separate elements of the excess cost adjustment are weighted together to yield the final excess cost adjustment for each data zone, using national programme weights as shown in Table 1 below below. The urban-rural categories for which the excess cost adjustment is calculated are shown in Table 2 and the (approximate) proportion of health board populations by category.

**Table 1: Care Programme Expenditure Weightings:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Acute | Care of the Elderly | Mental Health & Learning Difficulties | Maternity | Community Travel-based | Community Clinic-based | Overall HCHS | GP Prescribing |
| 50.8% | 3.2% | 11.9% | 3.6% | 11.6% | 5.8% | 87% | 13.0% |

Source: ISD (relating to the 2011/12 calculations)

**Table 2: Urban-Rural Categories:**

Large urban areas

Other urban areas

Accessible small towns

Remote small towns

Very remote mainland areas and non-SDIA islands

Accessible rural areas

Remote rural areas

SDIA islands

**Annex 2: NRAC Technical Report E – extract relating to cost ratios.**





1. Note that for the calculation of the ratio the same (volume of) health care is used in the numerator and denominator – but with actual unit costs or national unit costs of those treatments applied. Differences in the level (i.e. volume) of treatments per person are captured by the MLC and the age-sex elements of the formula. [↑](#footnote-ref-1)
2. All costs relevant to the NRAC formula – i.e. not including capital costs. [↑](#footnote-ref-2)