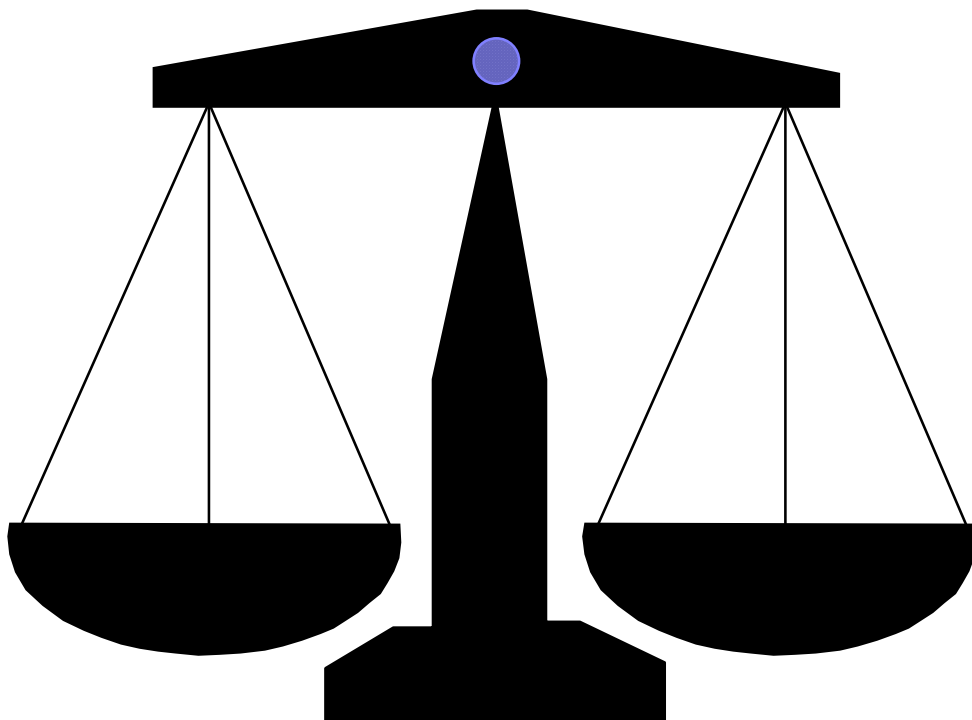


**ALLOCATING RESOURCES TO HEALTH AND SOCIAL CARE
COMMISSIONERS: PROPOSED CHANGES TO THE WEIGHTED
CAPITATION FORMULA**

**A SUMMARY OF THE
FIFTH REPORT FROM THE
CAPITATION FORMULA
REVIEW GROUP**



May 2008

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1 INTRODUCTION

- 1.1 The Department of Health, Social Services and Public Safety (DHSSPS) provides funds to Health and Social Care commissioners to purchase services to meet the health needs of their resident populations. To aid them in this process the Department uses a complex statistical tool known as the Regional Capitation Formula.
- 1.2 The formula informs the Department on the most appropriate way to split funds between commissioners on a fair and equitable basis. It does this by taking into account the age, gender and additional need of the populations in question. Additional needs are often linked to deprivation. Also taken into account are factors such as the impact on costs of delivering services in rural areas (rurality) , the impact that the size of an organisation can have on its costs (economies/ diseconomies of scale) and additional income generated from client contributions to the care provided by nursing and residential homes. These concepts are explored later in this report.
- 1.3 Given that the demands for Health and Social Care can be greater than the pool of funds available, the formula can not guarantee that all health and social care needs are met. Rather the formula helps the Department to, as far as possible, ensure that all populations have fair access to the resources that exist.
- 1.4 Whilst the formula's main use is to inform decisions on allocations from DHSSPS to commissioners, it has other important uses. It aids DHSSPS in negotiations regarding access to additional public funds, it supports commissioners in planning their locality equity strategies

and helps ensure that resources are targeted at those in greatest need. The formula is also important when considering community performance indicators and other benchmarking strategies. This is because any assessment needs to consider how over/under funded those services may be.

- 1.5 The Regional Capitation Formula is made up of formulae based on the nine programmes of care used in the management of health services. Previously this equated to nine separate formulae but the current Capitation review proposes that Acute Services be further split into separate elective and non elective formulae. (Further detail on this concept is provided in Chapter 2.) These formulae undergo revisions, when deemed appropriate, to keep them up to date and reflective of any changes that have occurred in the health system.
- 1.6 Responsibility for the management and quality assurance of this process rests with the Capitation Formula Review Group (CFRG). CFRG is a multi-disciplinary group drawn from the DHSSPS and four Health and Social Services (HSS) Boards.
- 1.7 The group manage and monitor the Regional Capitation Formula ensuring that it is kept up to date with cutting edge statistical methodologies. They quality assure researchers work ensuring that any recommendations being made withstand rigorous interrogation.
- 1.8 CFRG also evaluate the impact of wider health and social care changes and recommend alterations when appropriate. The group also scrutinise the impact that changing demographics have on resource allocation.

1.9 When CFRG published their last review of the formula in August 2004, a number of recommendations were made for future work. The subsequent public consultation raised other issues for development or investigation. These final recommendations were endorsed by the then Minister for Health, Social Services and Public Safety. As such, the current review of the formula, the fifth, has focussed on the following areas of work.

- The production of two new formulae for Acute Services.
- Updating the Elderly Care formula.
- An investigation into specific costs associated with hospitals

1.10 It should be noted that this report aims to provide an overview of how the Regional Capitation Formula works. It is an introduction/ refresher to the key themes on which this important statistical tool is based. This summary document is not designed to be a technical discussion and readers wishing a fuller analysis should refer to the document entitled “A Fifth Report from the Capitation Formula Review Group” or the individual technical reports produced by researchers. These reports can be accessed online at www.dhsspsni.gov.uk/index/consultations/current_consultations

2 THE REGIONAL CAPITATION FORMULA

- 2.1 The Regional Capitation Formula is a cutting edge, statistical tool that calculates how much of available funds should be given to each of the commissioners of Health and Social Care. This aids the Department in allocating funds to meet the public's health and social care needs.
- 2.2 The formula calculates the fair share of funds for each of the commissioners by taking into account their local population structures and other additional need related factors. This chapter will explore how this is achieved drawing on the key features of the formula.
- 2.3 There are three factors that influence the demand on health and social care services for an area and therefore the amount of money that commissioners receive. These are:
- The number of people living within the area
 - The age/gender profile of those populations
 - The additional needs of the population, largely linked to its socio-economic profile but also covering living conditions such as elderly people living alone
- 2.4 Population plays an important role in the formula and demographic changes are the main driver when allocating funds. Each year the population figures in the formula are updated to reflect the Mid Year Estimates (MYEs) produced by the Northern Ireland Statistics and Research Agency (NISRA). This means that the amount of funds

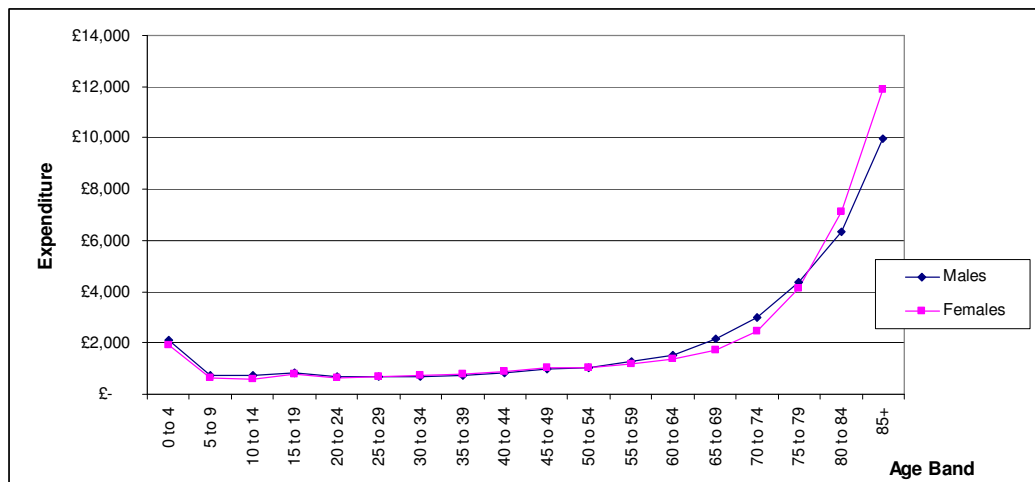
given to commissioners is tied directly to the changing demography of their resident populations.

- 2.5 There is a two year time lag when using MYEs to update the capitation formula. For example updates to the formula for the financial year 2008/09 utilise the MYEs for 2006. Population projections have not been produced by NISRA at a sub Northern Ireland level since 2002 and are felt to be somewhat out of date. Therefore in the absence of more up to date population projections it is considered that mid-year estimates are the best alternative for use in the capitation formula.

Age and Gender in the Formula

- 2.6 The age and gender structure of populations is important to the formula. Population make-up varies across Northern Ireland with each commissioner having their own unique mix of children, working age persons and the elderly. As such each commissioner has a different need for services.
- 2.7 The average expenditure per person by age group on Health and Social Care changes significantly over time. The graph on the following page highlights that there is a high cost in relation to children aged 0-4. The average cost then drops and is consistent until around the 60-64 age band. At this point Health and Social Care costs increase. This is not surprising and it is to be expected that average care costs of older people are higher than someone in their 30's.

Table 2.1 - Average Costs across all PoCs for Males and Females.



2.8 However it is also obvious that Health and Social Care covers a wide range of services and that there are services in which elderly costs would be unexpected. e.g. Maternity Services. Each service therefore has its own unique age/gender cost relationship.

2.9 The Regional Capitation Formula deals with this by comprising of ten smaller formulae based on the nine programmes of care (PoC) used in the management of health and social care services.

They are:

- PoC 1 Acute Services (this PoC has two formulae one for elective and one non-elective services)
- PoC 2 Maternity and Child Health
- PoC 3 Family and Child Care
- PoC 4 Elderly Care
- PoC 5 Mental Health
- PoC 6 Learning Disability
- PoC 7 Physical and Sensory Disability
- PoC 8 Health Promotion and Disease Prevention
- PoC 9 Primary Health and Adult Community

- 2.10 Each specific formula adjusts for age and gender differences for that programme of care by “weighting” population figures used. This simply means that more power is attached to those age bands that utilise the service the most. For example within Programme of Care 3, Family and Child Health costs are highest for ages 10-14 and therefore this age band is given most weight.
- 2.11 To produce these weightings researchers obtained detailed analyses of the cost of services by age and gender for each of the nine programmes of care. The current review of the formula has produced new Age/Gender weightings for Acute Services and Elderly Care. Indeed the work on Acute Services actually produced two sets of weightings – one for Non Elective (i.e. emergency admissions) and one for Elective admissions. The relationship between age and cost was somewhat different for the two types of Acute services and so their separation enhances the formula.

Consideration of Additional Need

- 2.12 Other factors are taken into account by the formula to ensure that the needs of local populations are met as far as possible. Economically deprived areas are known to have increased levels of illness such as higher prevalence of certain cancers, and the need for higher levels of social care interventions. An adjustment is made to take into account any additional need beyond the impact of age profile. These additional need weightings are calculated during detailed research programmes utilising statistical methods.
- 2.13 During the fifth review “Additional Needs Indices” were produced for both Elective and Non-Elective Acute Services and Elderly Care. A

detailed discussion on this work is available in the document entitled “A Fifth Report from The Capitation Formula Review Group”.

- 2.14 For all consultant-led research, a steering group comprising of the researchers, Board and Trust colleagues, DHSSPS Statisticians and Finance representatives supervised the work on a day-to-day basis. This review encompassed a thorough quality assurance process and group sign-off on all reports and work produced during the research.
- 2.15 The work undertaken involved the statistical analysis of small population groupings known as Super Output Areas. Population numbers in these areas range between 1,300 and 2,800 people so comparison between them is valid and meaningful. Statistical relationships were examined between the actual use of Acute and Elderly Services in these areas and a range of socio-economic and other indicators. These included unemployment rates, standardised birth rates, proportion of residents receiving income support or family credit, proportion of people owning their own home, proportion of elderly living alone etc.
- 2.16 The impact of supply was considered during this process. One school of thought suggests that populations are more likely to access hospital services rather than attend a GP if they are in close proximity to those services. Supply factors therefore influence the use and costs of services provided. CFRG paid particular interest to this issue during modelling ensuring that its influence was fully understood. The group highlighted the treatment of supply as an area for specific attention during the peer review process.

- 2.17 In Acute Services the process of model formation took place twice, once to measure the additional need of people accessing Non Elective Services (i.e. emergency admissions where patients are admitted rapidly after assessment or transfer from other hospitals) and once for those accessing Elective Services (i.e. where a decision to admit the patient is made by a Consultant or member of their team but this does not happen immediately. For these non-emergency cases, the wait can be linked to available resources but can also be for clinical or social reasons).
- 2.18 Assessing which of the pool of variables available best explained the differential use of Elective, Non Elective and Elderly services by commissioner's populations lead to the selection of the most appropriate indicators for each type of service and the determination of the relative importance of these. These were then used to produce "additional needs indices".
- 2.19 Combining these "additional needs indices" with the age/gender populations already discussed produces "needs weighted populations" i.e. a population breakdown that reflects the impact of age and gender on services as well as additional need.
- 2.20 As part of the Fifth Review of the Formula CFRG is therefore proposing new needs weightings for:
- PoC 1 Elective
 - PoC 1 Non Elective
 - PoC 4 Elderly Care

Summary detail on these needs weightings are contained in Annex A of this report.

Combining the Formulae

- 2.21 The ten formulae (two for Acute Services and one for each of the Programmes of Care 2-9) therefore all have their own individual weightings for age/gender and need. To produce a single overall weighted population for each of the commissioners the formulae were subsequently merged. During this process the programmes of care that are largest in terms of planned expenditure have the greatest influence in the formula.
- 2.22 This simply means that the Acute programme (which has a planned expenditure of £1,036 million in 2007/08) will have greater influence than Learning Disability (planned expenditure of £182 million in 2007/08). However this does not lessen the importance of having ten specific formulae to measure the populations need. The production and interaction of ten formulae and weightings, representing the wide range of health and social care, means the Regional Capitation Formula is more reflective of need than a single monolithic calculation would be.
- 2.23 Previously the expenditure figures used in this process were based upon historical data i.e. where funds had actually been spent. However as the Regional Capitation Formula is forward-looking in nature a decision was taken to utilise the annual planning figures produced by the Strategic Resources Framework Group (further information on SRF can be obtained from the Department's website). CFRG felt that, given the unavoidable time taken to finalise Trust/Board accounts, any changes in expenditure patterns occurring from policy decisions were being delayed from feeding into the formula. As planning figures are now used this produces a

formula that is more reflective of any planned shifts in spending each year.

- 2.24 The amount of funds redistributed due to age/gender and additional need weights are detailed in Chapter 5 of this report.

Other Adjustments

- 2.25 Before funds are allocated to commissioners however, two further adjustments are made to take account of unavoidable differential costs. These are explored further in Chapter 4. The first is a recognition that there is an additional cost inherent in delivering services in a rural area (rurality). The spread of populations in rural areas means that there will be time and travel expenses not experienced to such a level in urban settings. The second deals with the impact of size on organisational unit costs (economies of scale).
- 2.26 A further adjustment was previously required to take into account income from residents of Nursing and Residential Care Homes. CFRG is now recommending that this adjustment is integrated within the Elderly model and removed for other programmes of care. Further information is provided in Chapter 4.
- 2.27 Finally researchers were also asked to look at the issue of unmet need. This concept suggests there are individuals in the population with health care needs who do not fully utilise services. This issue is further discussed in chapter 5 of this report.

3 HOSPITAL COSTS

- 3.1 CFRG commissioned researchers to investigate a number of costs associated with Hospitals to see if they were unavoidable and required adjustment within the Capitation Formula. They wanted to assess whether the funds provided in three areas were being handled in a manner that promoted equality of access. The areas were:
- Teaching and Medical Training Costs – Are the funds for the costs of undergraduate and postgraduate students allocated appropriately?
 - Specialist/Regional Service Costs – Do the providers of regional hospital services incur additional hospital costs that require to be recognised in the Capitation Formula?
 - Hospital Infrastructure Costs - Do large or specialist hospitals incur higher infrastructure costs that should be included in the funding formula?
- 3.2 This Chapter briefly summarises key findings from the research paper “*Research into Costs Associated with Acute Hospital Provision in Northern Ireland*“. For fuller detail and consideration of CFRG thoughts on the paper readers are invited to refer to “A Fifth Report from The Capitation Formula Review Group”.
- 3.3 **Teaching and Medical Training Costs** - The researchers found that 85% of the funds that were allocated to hospital trusts for Undergraduate training were given in a block grant. As a result the

level of funding did not vary dependent on the amount of teaching delivered.

- 3.4 The researchers recommended that there should be an introduction of a flat payment per student week (weighted by year of study) and after careful consideration CFRG agreed and recommended that DHSSPS investigate what the appropriate level of funding should be. DHSSPS is commencing a review of undergraduate positions in September 2008 which will assess appropriate funding mechanisms.
- 3.5 Researchers then looked at the additional costs of supporting the continual training of student doctors (post graduate). Their report highlighted that the majority of doctors in training are funded in full or part by the Northern Ireland Medical & Dental Training Agency (NIMDTA). An examination of the locations of post graduate doctors indicated an uneven distribution across hospitals in NI.
- 3.6 The average level of NIMDTA funding varies from 63% in the Eastern Board area to 66% in the Western Board area. A movement to 100% funding of all posts in all areas would have raised required NIMDTA resources from £29.2m to £45.7m for the year investigated (2003/04).
- 3.7 The report acknowledged that although costs varied for the Trusts in which the students were based, there was also a benefit associated with having student doctors on site. This included areas such as enhancing service quality and clinical safety, providing cover for unplanned absences and supporting emergency and out of hours rotas. However quantifying this benefit had proved difficult.

- 3.8 CFRG agreed that understanding the benefit of postgraduate doctors against the costs incurred by organisations was key to this area of discussion. They also noted that any further work into the cost/benefit relationship of postgraduate doctors would need to await the completion of the review that has been undertaken by Sir John Tooke into modernising medical careers. This wide-ranging review covers various aspects of training throughout the medical profession. Part of the second action emerging from the Tooke review is that there needs to be a better understanding of the contribution and role of trainee doctors in order that their benefit to hospitals can be properly assessed. CFRG recommend that a cost/benefit analysis of postgraduate doctors takes place once the Tooke review is completed.
- 3.9 **Regional/ Specialist Services Costs** – The majority of Regional Services are based in the Eastern Board. Regional Services support the whole of the Northern Ireland population. CFRG considered whether the work that was being undertaken for other commissioners would have an impact on costs in these facilities. In short researchers were asked to assess whether the flow of funds for regional services adequately met the additional costs that may be occurring in supporting residents of other commissioners.
- 3.10 Commissioners have financial agreements with Trusts that provide services stating the amount of activity to be delivered. These estimates are based on prior knowledge of service use and any changes in the system that they envisage for the year ahead. These

“Service and Budget Agreements” (SBAs) allow for the planning and regular performance monitoring for the year ahead.

- 3.11 The researchers investigated the issue of whether the SBAs adequately compensated providers for any additional costs linked to Regional Specialist services such as neurosurgery. They recommended that a full review of SBAs take place and an introduction of a pricing strategy that would reflect the complexity of different case-mixes. The recommendation to review SBA levels took place during summer 2007. A costing review of Acute Inpatient and Daycase costs which incorporates case-mix adjustments is nearing completion. CFRG recommend that a similar review should take place every few years and noted that the impact of this could be changes to existing equity gaps and a re-distribution of funds.
- 3.12 **Infrastructure Costs** – The researchers were asked to analyse whether there were any differences in costs related to infrastructure in hospitals. They stated that infrastructure costs may manifest themselves in a variety of forms including large teaching hospitals, specialist services and small local hospitals.
- 3.13 As infrastructure costs were difficult to define the researchers looked at Reference Costs, Specialty Costs and Procedure Costs to check whether infrastructure was being identified in the different methods of cost apportionment.
- 3.14 The researchers suggested that the approach to look at different types of costs, outlined in 3.13 above, did not show an influence of infrastructure costs. They stated that infrastructure costs were

difficult to identify. The research team suggested that although the process to produce reference costing was robust, it could be refined to capture costs relating to, for example, new estate buildings and apportion these separately to reference costs.

- 3.15 The study concluded that while material issues for the Capitation debate had not been identified, there was a need to better align the cost recovery process.
- 3.16 A key consideration for CFRG was the impact that the economies/diseconomies of scale adjustment (see paragraph 4.6) had on infrastructure costs. The group suggested that work needed to be taken forward after the 5th Capitation review to analyse the Economies of Scale impact. See Chapter 4 for further discussion on this topic.

4 THE DIFFERENTIAL COSTS OF PROVIDING CARE

- 4.1 This chapter discusses additional adjustments that are made to the Regional Capitation Formula to compensate for the differential costs associated with providing Health and Social Care.

Delivering Services in a Rural Area

- 4.2 Populations in rural areas are dispersed more than those in urban areas. This places an additional cost on providers of services. For example, a district nurse visiting a patient in a rural area will generally spend more time travelling to the patient than a district nurse in a town or city. Not only does increased travelling time for professionals raise the cost of treating patients, it also increases other travelling expenses.
- 4.3 To adjust for the impact that “rurality” has on costs, electronic maps of Northern Ireland were produced during the third Capitation review. These are used to calculate the most efficient routes along the road network to get from the place from which the service is provided to where populations are based. The need for journeys was based upon the numbers of people living in these areas, their ages and appropriate measures of ‘additional need’.
- 4.4 Research was commissioned during the third review of the formula to investigate the additional cost of providing twenty two services in rural areas. Each year the cost of delivering these services is monitored and the rurality adjustment uplifted by the same percentage as that recorded for the total expenditure on that service. This process maintains the value of the adjustment. The overall

rurality adjustment for each commissioner is then incorporated into the final formula.

- 4.5 CFRG agreed during the current review of the formula that there is a requirement to update Health and Social Care locations to take into account any new facilities and remove any old ones from the electronic map. Furthermore any changes occurring to commissioner boundaries as a result of the Review of Public Administration (RPA) may have an impact on the distribution of populations and the services that support them. These changes could impact on the rurality adjustment for each of the commissioners and will need to be investigated. However given the state of change in the Health and Social Care sector, CFRG feel it prudent to allow a period of reflection to take place before any new work is commissioned.

Economies/ Diseconomies of Scale

- 4.6 The size of an organisation has an impact on its unit costs. For example, facilities of a smaller size will have pressures in achieving an optimal unit cost for their services. This is because they do not have large patient/client numbers over which to apportion their indirect and overhead costs. Similarly larger facilities can have additional costs related to their size (“diseconomies of scale”). The combination of economies and diseconomies of scale suggests that there is an optimum size at which an organisation minimises the cost of delivering its services. CFRG has investigated these effects in relation to hospitals within NI.

- 4.7 In addition, smaller community facilities located in sparsely populated areas will face greater variability in their daily workload. Consequently, a larger proportion of their staff are required to deal

with the unexpectedly busy days than would be the case in larger facilities which have a more predictable client throughput. This is also an economies of scale effect and the formula separately adjusts for this via a Community Services Economies of Scale (EoS) adjustment.

- 4.8 The hospital EoS adjustment attempts to compensate Boards for having hospitals that are of a size that does not promote optimal unit costs. It is based on the Developing Better Services (DBS) model. CFRG recognised that as DBS is yet to be fully implemented the current cost of hospitals is being borne disproportionately across populations. The model provides the best strategic locations for hospitals as planned for through Departmental policy.
- 4.9 CFRG discussed the role of this adjustment during the current review and agreed that it should be revisited to take account of future hospital locations. The group also acknowledged that the work emerging from the review of hospital costs, see Chapter 3 (paragraph 3.11), could have an impact on calculations of the unit costs of hospitals.

Other Financial Issues

- 4.10 A final adjustment takes place in relation to the income that is collected from the clients of residential and nursing homes. The aim of this technical adjustment is to equalise the income collected across Health and Social Care commissioners. The information is based on data captured as part of the financial year end process and the adjustment is applied directly to the relevant Programme of Care i.e. Elderly Care, Mental Health, Learning Disability and Physical & Sensory Disability.

- 4.11 As part of the current review changes were made to the way this process operates. Statistical testing of the new Elderly Care model showed that the model produced using home care costs excluding private client contributions was better. In effect, this means that the resultant model will only compensate commissioners for the care costs borne directly by them. As this is precisely what the original income adjustment was intended to achieve, it then becomes redundant.
- 4.12 In several other PoCs, however, client contributions are still included within the modelled costs. Therefore, final results for these models still need to be adjusted to equitably redistribute these funds. Considering that the Elderly income adjustment is no longer necessary, CFRG agreed, that given the small material impact of these adjustments in other PoCs, and ongoing data quality issues, separate client contribution adjustments should be excluded from the other programmes of care.

5 EQUALITY ISSUES AND LIFETIME OPPORTUNITIES

Lifetime Opportunities

- 5.1 The Governments' Anti-Poverty and Social Inclusion Strategy for Northern Ireland is called Lifetime Opportunities. It was launched in 2006 and emerged from a review of New Targeting Social Need policy. The policy acknowledges the need for a joined-up approach across government departments to target policy at those most in need. The strategy is made up of a series of targets aimed at the elimination of poverty and social exclusion in Northern Ireland by 2020.
- 5.2 The strategy is structured around a number of general challenges which are highlighted in the report as priorities for future policy and action. Of these the most relevant for the Department of Health, Social Services and Public Safety, and therefore CFRG, is Tackling Health Inequalities. As highlighted in the Lifetime Opportunities report *"People who are better off tend, for the most part, to live longer and healthier lives than those living in poverty. It is important therefore to reduce inequalities in health between geographic areas, socio-economic and minority groups and direct spending towards those in greatest need."*
- 5.3 As discussed in this report, the weighted capitation formula attempts to match resources to the need for health and social care services. We have seen how population numbers and age and gender weightings are included in formula calculations to meet these demands.

- 5.4 However it is clear from the extract above that socio-economic factors should also be given consideration in the resource allocation process. As discussed in Chapter 4 measuring the “additional need” caused by socio economic factors is a key element of the formula.
- 5.5 ‘The Fifth Review of the Capitation Formula’ provides a detailed analysis of how sensitive the formula is to additional need and age/gender need at Super Output Area (SOA). SOAs allow a comparison at small area level with populations of comparable size. CFRG carried out their analysis at this level as variations can be hidden at commissioner level as these larger areas are mixtures of affluent and deprived areas.
- 5.6 Ranking the SOAs on the basis of their age/gender and additional needs weightings produces two very different lists. This is not surprising given that deprived areas often consist of young populations and affluent areas of the elderly. Three of the top five weighted SOAs on the basis of age/gender are based in the local government district of North Down (two in Churchill and one in Broadway). The lowest four SOAs are in Belfast in the Botanic Area due to the student population there.
- 5.7 Five of the top six SOAs that receive the highest weighting in the formula for additional need are in Belfast. These are in the Shankill, two in the New Lodge, one in Whiterock and one on the Upper Springfield Road. Three of the lowest four SOAs for additional need are in North Down with the lowest in Stranmillis.
- 5.8 The table below shows the highest and lowest ranked SOAs for the four HSS Board Areas ranked by Additional Needs Index.

Table 5.1 – Highest and Lowest Ranked SOAs by Board Area

	EASTERN	NORTHERN	SOUTHERN	WESTERN
Highest SOA	Shankill_2 - Belfast	Cross Glebe - Colrairie	Drumnamoe_1 Craigavon	East - Strabane
Lowest SOA	Stranmillis_2 - Belfast	Strand_2 - Coleraine	Waringstown_1 - Craigavon	Culmore_5 - Derry

5.9 These top and bottom results fit in with CFRG perceptions of where the additional need for health and social care services is within Northern Ireland . Indeed a comparison of the additional needs weightings produced by the model with statistical measures of deprivation (such as the ‘Noble Measure of Deprivation’ and ‘Standard Mortality Rate for Under 75s’) further backs this up.

5.10 At small-area level, the formula redistributes £345m on the basis of age/gender, £357m for additional need and £402m for age/gender and need combined. As some deprived areas have a younger population and some affluent areas a more elderly population the redistributive effect of age/gender and need combined is less than the sum of the separate age/gender and additional need effects.

Unmet Need

5.11 CFRG discussed the issue of unmet need. This concept suggests that the poorer health status of people in low-income, low-education, unemployed or minority ethnic groups may not be reflected in the amount of use that these groups make of the health service. If the theory is correct then the Regional Capitation Formula may not adequately take into account the needs of these people.

5.12 Researchers were directed to investigate this issue and advise on an appropriate statistical mechanism to adjust for unmet need if it did indeed exist. The proposed statistical method would have resulted in a maximum impact of moving £500,000 between HSS Boards in the PoC 1 elective model. Unmet need was not of any significance in the PoC 1 non-elective or elderly care models.

5.13 The researcher's proposed mechanism to adjust for unmet need was included in the final capitation models and the evidence for an unmet need adjustment was much reduced. The issue was then referred to peer reviewers for their consideration. They advised of further tests that should be carried out. The results of these tests failed to support the case for unmet need. Considering all the available results it has been found that there is little statistical basis to make an unmet need adjustment. However unmet need remains an important methodological consideration for CFRG in all future modelling.

Equality Issues

5.14 The extract taken from the Lifetime Opportunities document mentions the requirement to reduce inequalities for "minority groups". Also, as outlined in Section 75 of the 1998 Northern Ireland Act, there is a requirement for public authorities to carry out their work with due regard to promoting equality of opportunity:

- *between persons of different religious belief, political opinion, racial group, age, marital status or sexual orientation;*
- *between men and women generally;*
- *between persons with a disability and persons without; and*
- *between persons with dependants and persons without.*

- 5.15 Meeting the requirements of equality legislation has been central to CFRG consideration on the development of the Capitation formula. Discussions during the development of the Elective Model lead to the inclusion of the variable “Proportion of mid-aged females (45-64)” on promotion of equality grounds. Discussions centred on two models that had little to separate them statistically. One included the variable highlighted above and the other did not. CFRG members felt that the one containing the section 75 grouping should be taken forward. This was felt to be justified on equality grounds as the age-gender weightings which are applied in the formula prior to the needs weightings, in this instance, did not appear to adequately address the full needs of this particular demographic sub-group.
- 5.16 Behaviour of the formula in relation to Section 75 groups is recorded in the main report. The analysis details a number of differing impacts across the equality groups. For example, it shows that the elderly are needier because of the impact of their age but they do not tend to live in areas with higher additional needs. It also shows that females on average need more Health and Social Care resources because on average they live longer.
- 5.17 The full analysis in the main report shows that the formula directs resources in accordance with the principle of equal resources for equal need and concludes that where equality groups receive fewer resources, it is the result of the population being younger or less deprived.
- 5.18 In conclusion CFRG agreed that the formula does not create any adverse impacts on equality groupings.

6 CONCLUSIONS & WAY FORWARD

- 6.1 The Regional Capitation Formula is one of the most sophisticated currently in use and to maintain this CFRG has sought a programme of continual improvement.

Modelling

- 6.2 As part of their current review, CFRG is recommending that the formula used for POC1, Acute Services, be split into two separate models to take into account Elective and Non Elective characteristics. This will mean that the new models will more accurately reflect the need for these services. This model was last updated in 1998 and accounts for approximately 42% of expenditure in Health and Social Care. Detail on the proposed Elective and Non Elective variables are shown in Appendix A of this report.
- 6.3 CFRG is also recommending that the model used for PoC4, Elderly Care be updated. This model was last updated in 2000 and accounts for approximately 23% of expenditure in Health and Social Care. Details of the proposed model are summarised in Appendix A of this report and detailed in Chapter 4 of the main report.

Hospital Costs

- 6.4 A report was commissioned as part of the Fifth Review into costs associated with Acute Hospitals. This report covered Regional Services, Teaching and Medical Training as well as Infrastructure costs.

- 6.5 Further work has been taken forward by HPSS in relation to Regional Services costing. CFRG recommends that DHSSPS investigate what the appropriate distribution of funding should be in relation to undergraduate training. A review of this area is to commence in September 2008. Further work into postgraduate funding should take into consideration recommendations emerging from the Tooke Review.
- 6.6 In relation to infrastructure CFRG recommend that work should be undertaken to assess the impact of the Economies of Scale adjustment. (see Chapter 4). They also foresee the need to update the way in which rurality is assessed once health commissioner boundaries settle.

Way Forward

- 6.7 In the past CFRG has recommended new modelling work to be undertaken at the end of each review. However, given the current reform in the Health and Social Care sector, CFRG think it prudent to allow a period for the new structures to settle and any changes in the system to be realised before new work on programmes of care formulae are commissioned.
- 6.8 As highlighted in 6.6 the group recommend that work be taken forward on Economies of Scale.
- 6.9 The changes that are being proposed to the Acute Services and Elderly Care formulae, highlight CFRG's commitment to utilise the most up-to-date methodologies available in resource allocation. CFRG remain focussed on ensuring that the formula is as current and reflective as the scale of public funds demands.

ANNEX A PROGRAMME OF CARE SUMMARY

The following Annex summarises the individual formulae that make up the Regional Capitation Formula. Full explanation of how the weightings are produced is contained within the main report from CFRG. The aspects outlined for each of the 10 separate formulae in the following pages are:

POC Expenditure Weights –These are the percentage shares of the overall Capitation formula that each individual formulae represents. They are calculated using planned expenditure for the year ahead. As discussed in Chapter 2, the greater the planned expenditure in the year ahead on a particular programme, the greater the influence the individual formulae will have on the overall model.

Additional Needs Index: - A summary of the variables used to produce each of the Additional Needs Indices for the formulae. As discussed in Chapter 2 these are the product of extensive research in the programmes of care. The Northern Ireland Average is represented by a Needs Index of 100. Numbers below 100 equate to less additional need, an index above 100 equates to a higher level of additional need.

Age/Gender Weighting: Age/gender weightings are shown for a number of the formulae where appropriate. These weightings highlight the impact that age and gender has on the need for resources and how patterns of cost are specific to each formulae. Where possible, graphs have been produced to show this change.

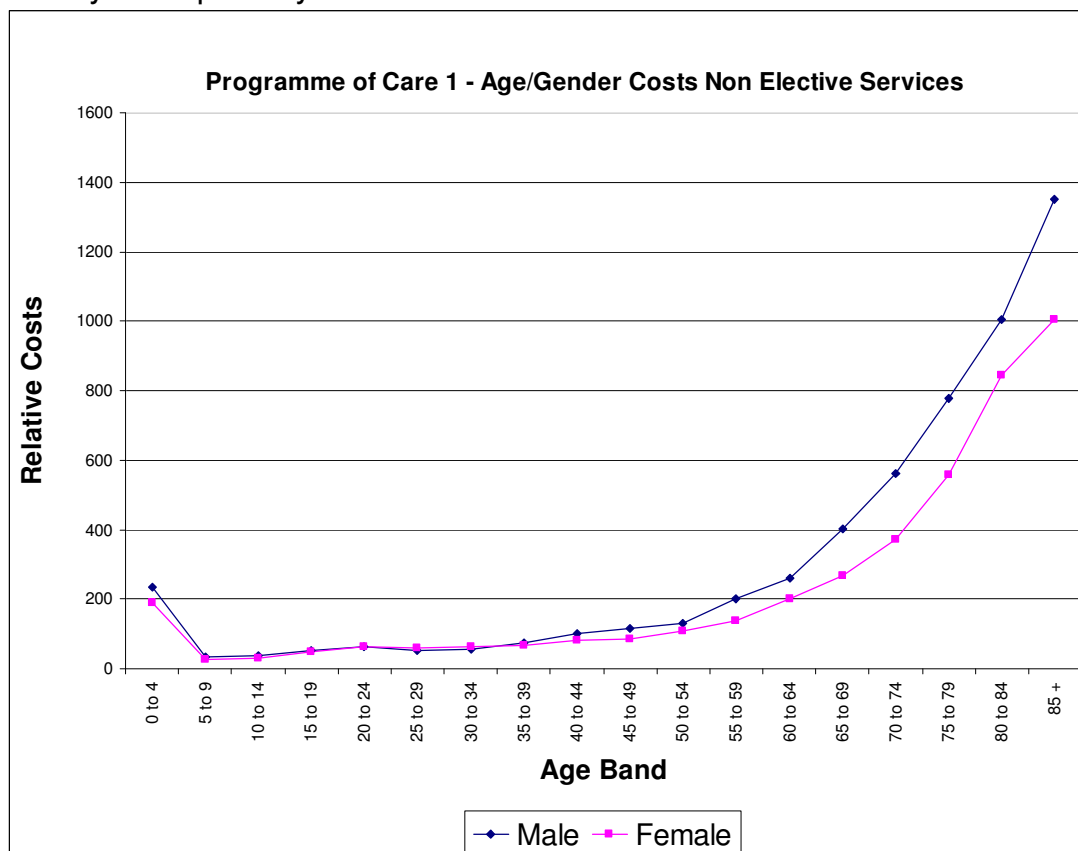
Relevant Research: A summary of papers produced in the production of the revised age/gender and additional needs indices.

A1.1 – PoC 1 - Acute Non-Elective Services - Summary

2008/09 POC Expenditure Weights¹: 17.7%²

Age/Gender Weighting Graph:

These have been statistically estimated from Northern Ireland inpatient activity and specialty cost data.



Age/Gender Relative Costs									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44
Male	235.19	33.95	36.02	51.48	63.74	52.47	54.15	73.89	98.99
Female	189.26	27.63	29.95	46.86	62.02	60.99	63.56	65.32	81.5
Age	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 +
Male	116.27	129.44	200.96	260.98	402.04	562.06	778.06	1006.13	1350.79
Female	84.05	106.2	136.73	201.51	267.42	371.88	557.75	844.67	1005.38

¹ The expenditure weights that are reported here are based on the Strategic Resources Framework (SRF).

² The expenditure weight for the elective and non elective PoCs are based on investigations carried out for the research: Resource Allocation Modelling for Services for POC1 and POC4: Phase A (Data Evaluation and Methodology) - Tribal Secta

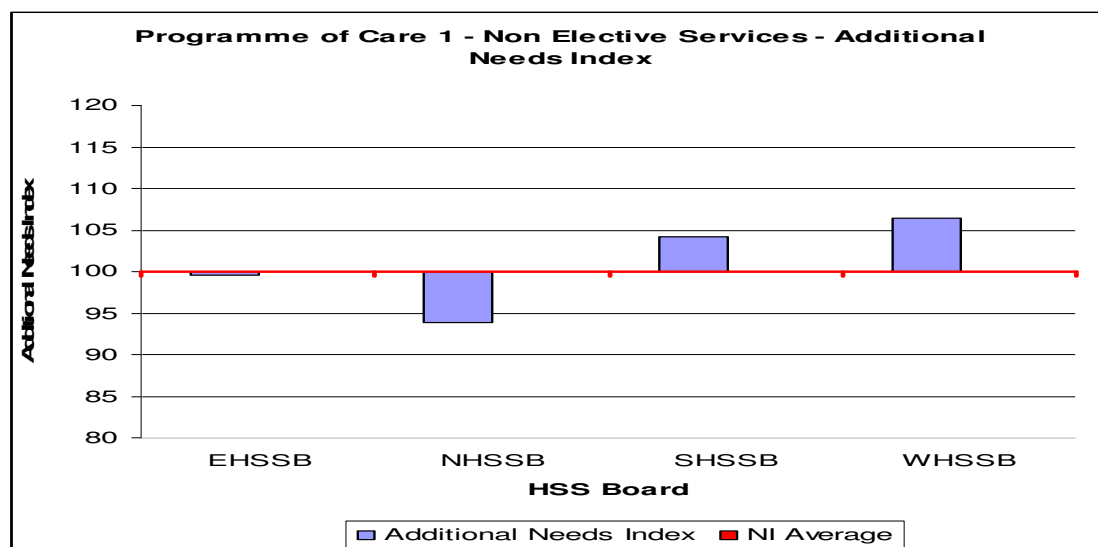
Additional Needs Index PoC 1 - Acute Non-Elective Services:

The needs index is individual to each HSS Board and is derived from a statistical modelling exercise based on Northern Ireland data. The needs index is really a composite index made up of the following five variables:

- ‘Proportion of 65+ population not claiming Attendance Allowance’,
- ‘Standardised self-reported not good health for all persons’,
- ‘Northern Ireland Multiple Deprivation Measure (2005)’,
- ‘Standardised Birth Rate (2000-2004)’
- ‘Proportion of all households not owned outright’.

The Northern Ireland average is 100. HSS Boards above the Northern Ireland average have a need for non-elective services greater than the NI average.

Values below 100 indicate a need less than the NI average.



The chart above highlights that WHSSB has the highest level of additional need across the four Boards for Non Elective Services whilst NHSSB has the lowest.

Relevant Research:

“Resource Allocation Modelling for Services for POC1 and POC4: Phase A (Data Evaluation and Methodology) - Tribal Secta (2006)”

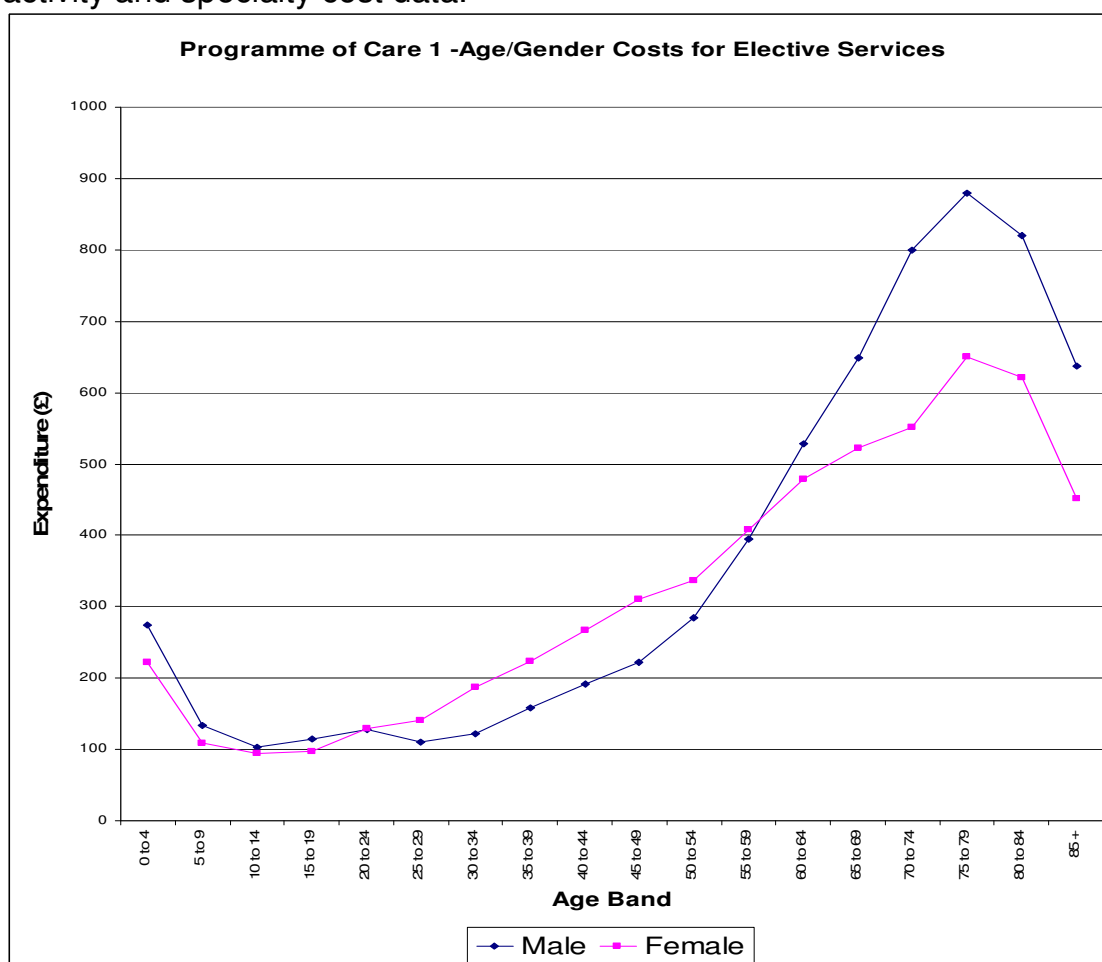
“Resource Allocation Modelling for Services for POC1 and POC4: Phase B (Generating the Models) - Tribal Secta (2007)”

A1.2 – PoC 1 - Acute Elective Services - Summary

2008/09 POC Expenditure Weights: **24.6%**³

Age/Gender Weightings:

These have been statistically estimated from Northern Ireland inpatient activity and specialty cost data.



Age/Gender Relative Costs									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44
Male	274.22	133.96	102.82	114.34	127.66	110.56	122.31	158.58	191.18
Female	221.39	108.26	94.49	96.63	129.52	140.67	187.36	223.04	267.39
Age	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 +
Male	221.98	284.77	394.66	529.02	648.77	799.88	880.05	820.72	637.12
Female	310.46	336.59	408.36	479.28	521.93	550.9	650.17	621.1	451.7

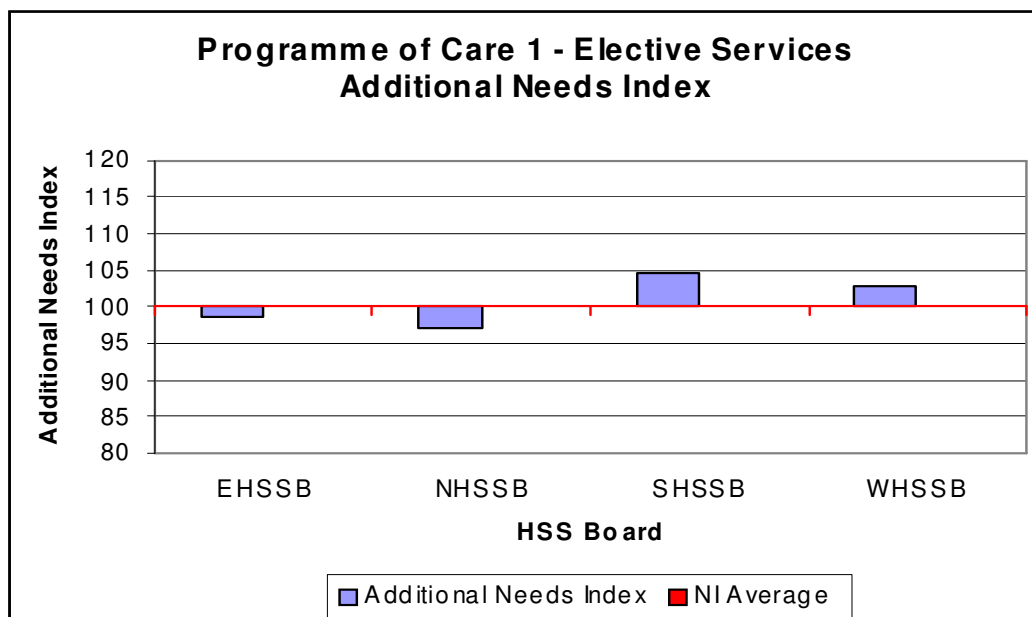
³ The expenditure weight for the elective and non elective PoCs are based on investigations carried out for the research: Resource Allocation Modelling for Services for POC1 and POC4: Phase A (Data Evaluation and Methodology) - Tribal Secta

Additional Needs Index PoC 1 - Acute Elective Services:

The needs index is individual to each HSS Board and is derived from a statistical modelling exercise based on Northern Ireland data. The needs index is really a composite index made up of the following seven variables:

- 'Proportion of 65+ population not claiming Attendance Allowance',
- 'Standardised limiting long-term illness for all persons',
- 'Standardised cancer incidence rate (1993-2003)',
- 'Standardised Birth Rate (2000-2004)',
- 'Proportion of all households not owned outright'
- 'Proportion of households with 2 or less children'
- 'Proportion of all females aged 45-64'.

The Northern Ireland average is 100. HSS Boards above the Northern Ireland average have a need for acute elective services greater than the NI average. The chart below highlights that SHSSB has the highest level of additional need across the four Boards for elective services whilst NHSSB has the lowest.



Relevant Research:

Resource Allocation Modelling for Services for POC1 and POC4: Phase A (Data Evaluation and Methodology) - Tribal Secta (2006) “

“Resource Allocation Modelling for Services for POC1 and POC4: Phase B (Generating the Models) - Tribal Secta (2007)”

A1.3 – PoC 2 - Maternity & Child Health - Summary

2008/09 POC Expenditure Weight: 4.38%

Age/Gender Weighting:

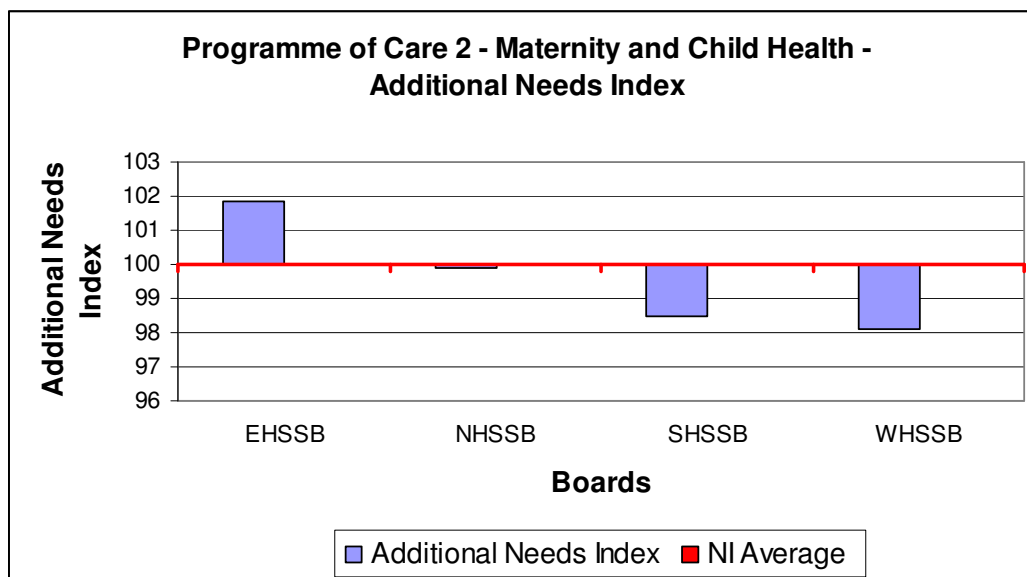
The principal driver of resource consumption in this programme of care is the number of births which is partly an age/gender weighting and partly an additional needs weighting.

Additional Needs Index PoC 2 - Maternity & Child Health:

Inpatient Maternity Services and Antenatal Care - The needs index is individual to each HSS Board and is derived from a statistical modelling exercise based on NI data. The needs index is really a composite index made up of the following variables:

- 'Mothers Age',
- 'Low Birth weight',
- 'No Previous Births'
- 'Multiple Births'

At NI level the needs index = 100. HSS Boards with a value greater than this have a need for services greater than the NI average whilst values less than this indicate a need less than the NI average.



It can be seen from the chart above that Western has the lowest additional need in relation to this programme of care. Eastern Board has the highest. The index is updated annually and is based on, and applied to, the latest three years births data that are available for each HSS Board.

Community Child Health Services

It did not prove possible to develop a formula appropriate for resource allocation purposes so the Group recommended using the population aged 0-4 with the 'under 75 SMR' applied to 30% of these services (representing the non-statutory element).

Relevant Research:

"Development of Health & Social Care Needs Indicators for the HPSS Capitation Formula" (1998) - York Health Economics Consortium/Morgan Spollen Associates.

"A Revised Capitation Funding Formula for Maternity and Child Health Services in Northern Ireland" (1999) - York Health Economics Consortium/Morgan Spollen Associates

"Rurality and the Need for Health and Social Care Services in Northern Ireland" (1999) – York Health Economics Consortium/Morgan Spollen Associates.

A1.4 – PoC 3 - Family & Child Care - Summary

2008/09 POC Expenditure Weights: 6.54%

Age/Gender Weightings: The figures below show that costs are highest in this programme of care in males up to the age of 14 and females up to the age of 19.

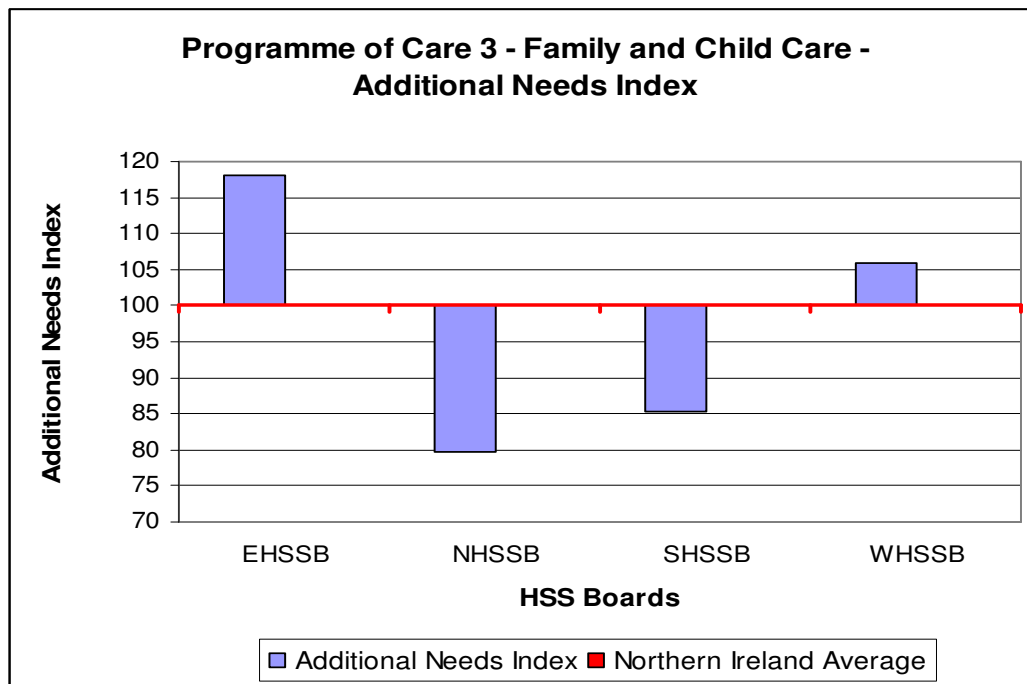
Age/Gender Relative Costs					
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 44
Male	1.14	1.36	1.37	1.00	0.10
Female	1.02	1.25	1.20	1.15	0.10

Additional Needs Index PoC 3 - Family and Child Care:

The Needs Index is derived from a statistical modelling exercise using Northern Ireland data. The needs index is a composite index made up of the following five variables:

- ‘Proportion of children in income support households’,
- ‘Proportion of 16-18 year olds not in full-time education’,
- ‘Noble Social Environment Score’,
- ‘Proportion of children in owner occupied housing’,

HSS Boards with a value greater than the Northern Ireland average (100) have a greater need for Family & Child Care Services whilst values less than this indicate a need less than the NI average.



The chart above shows that the NHSSB has the lowest additional need of the Four Boards and the EHSSB the highest.

Relevant Research:

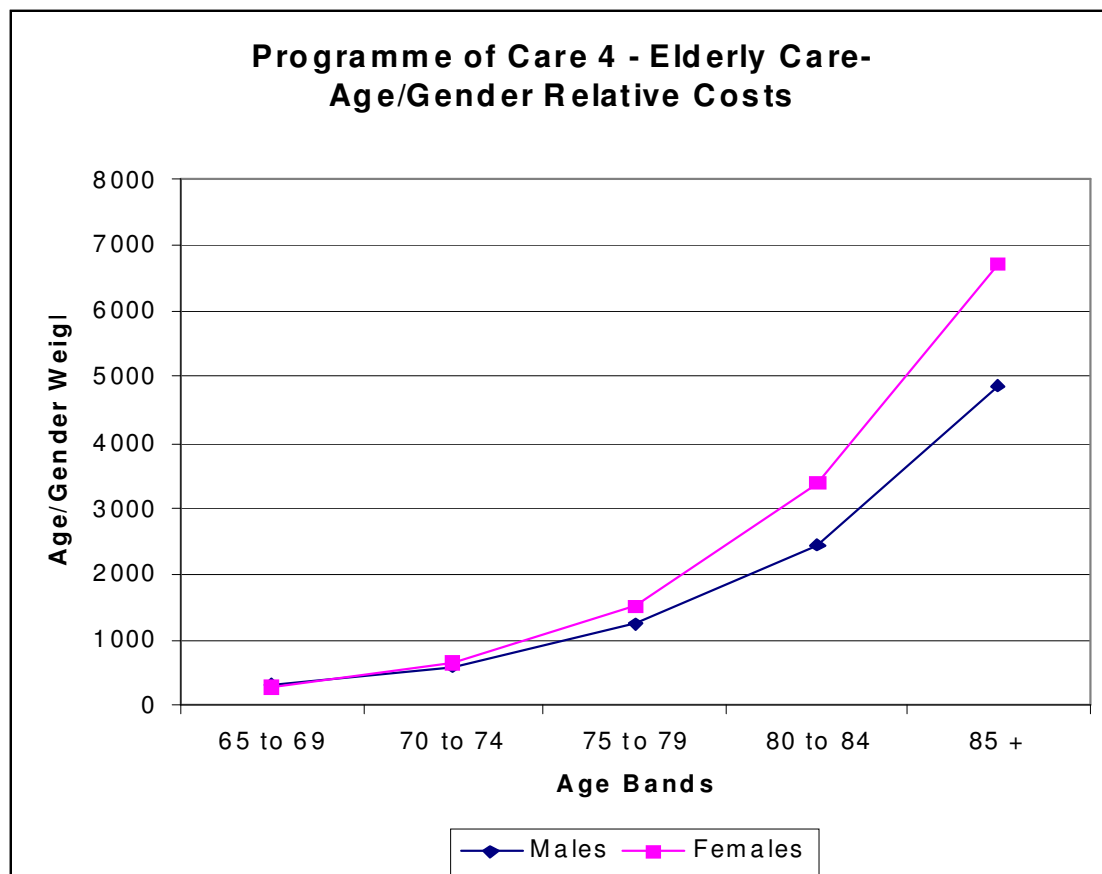
“Additional Needs Analysis for the Family and Child Care Programme of Care” (2004) - SECTA/ MSA Ferndale.

A1.5 – PoC 4 - Elderly Care - Summary

2008/09 POC Expenditure Weights: 22.52%

Age/Gender Weighting:

The composite NI weights presented in the table and graph below have been developed as a result of an exercise carried out across all four HSS Boards.



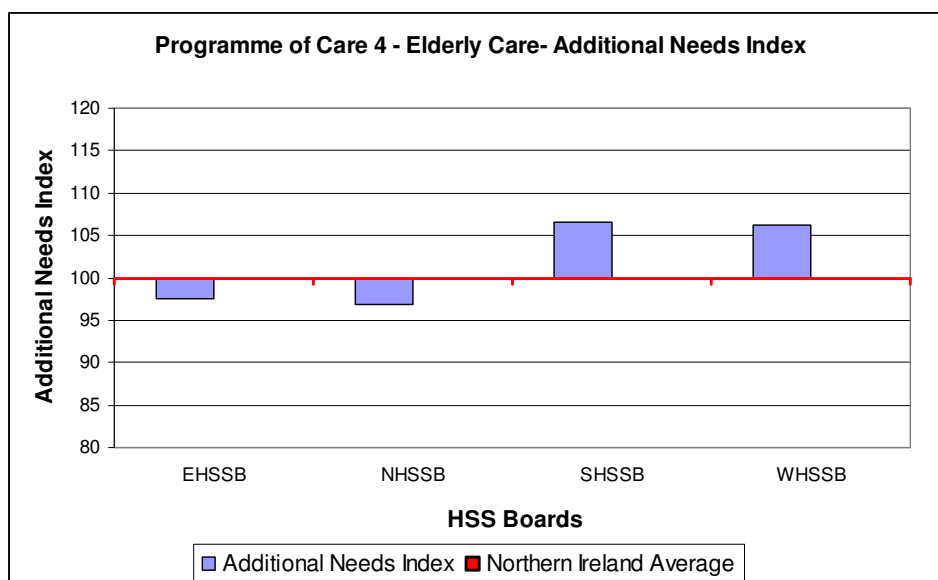
Age/Gender Relative Cost					
Age Band	65 to 69	70 to 74	75 to 79	80 to 84	85 +
Males	299.08	596.3	1239.81	2453.25	4859.86
Females	270.61	652.47	1510.57	3380.58	6708.15

Additional Needs Index PoC 4 - Elderly Care Services:

The needs index presented in the chart below are derived from a statistical modelling exercise using Northern Ireland data. The needs index is a composite index made up of the following five variables:

- 'Proportion of elderly population under 85 years of age',
- 'Standardised mortality rate for those aged 65 and over',
- 'Proportion of 65+ population not claiming Attendance Allowance' ,
- 'Proportion of pensioners not in social rented housing'
- 'Potential years of life lost per adult'.

At Northern Ireland level the needs index = 100. HSS Boards with a value greater than this have a need for elderly care services greater than the NI average whilst values less than this indicate a need less than the NI average.



The chart above shows that the Southern Board has the greatest additional need in programme of care 4.

Relevant Research:

“Resource Allocation Modelling for Services for POC1 and POC4: Phase A (Data Evaluation and Methodology) - Tribal Secta (2006)“

“Resource Allocation Modelling for Services for POC1 and POC4: Phase B (Generating the Models) - Tribal Secta (2007)”

A1.6 – PoC 5 - Mental Health - Summary

2008/09 POC Expenditure Weights: 7.80%

Age/Gender Weighting

The composite NI weights presented in the table below have been developed as a result of an exercise carried out across all four HSS Boards.

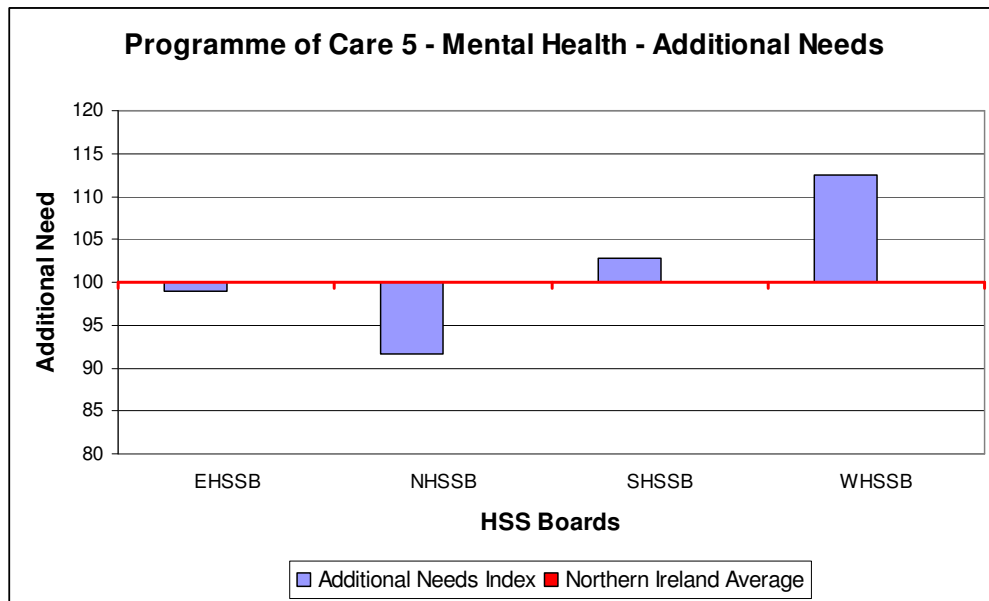
Age/Gender Relative Costs							
Age Band	0 - 4	5 - 14	15 - 44	45 - 64	65 - 74	75 - 84	85 +
Male	0.0	0.2	1.0	1.5	1.6	1.6	1.4
Female	0.0	0.2	0.9	1.3	1.6	1.8	2.1

Additional Needs Index PoC 5 – Mental Health:

The needs index presented below is derived from a statistical modelling exercise using Northern Ireland data. The needs index is a composite index made up of the following five variables:

- ‘Proportion of 16-64 year olds on income support’,
- ‘Proportion of dependents not in single carer households’,
- ‘Proportion of persons in households with head in manual class’,
- ‘Proportion of working age population who are students’,
- ‘Standardised mortality ratio 65-74 years of age’.

At Northern Ireland level the needs index = 100. HSS Boards with a value greater than this have a need for mental health services greater than the NI average whilst values less than this indicate a need less than the NI average.



The chart above shows that Western Board has the greatest additional need in Mental Health Services. Northern Board's additional need is below the Northern Ireland average.

Relevant Research:

“Development of Health & Social Care Needs Indicators for the HPSS Capitation Formula” (1998) - York Health Economics Consortium/Morgan Spollen Associates.

“A Revised Capitation Funding Formula for Mental Health services in Northern Ireland” (2000) - York Health Economics Consortium/Morgan Spollen Associates

“Rurality and the Need for Health and Social Care Services in Northern Ireland” (1999) – York Health Economics Consortium/Morgan Spollen Associates.

“A Revision of the Mental Health Funding Formula for Mental Health Services in Northern Ireland” (2003) - Project Support Analysis Branch, Information and Analysis Directorate, DHSSPS.

A1.7 – PoC 6 - Learning Disability - Summary

2008/09 POC Expenditure Weights: 7.44%

Age/Gender Weightings:

The composite NI weights presented in the table below have been developed as a result of an exercise carried out across all four HSS Boards. It can be seen that Learning Disability costs are highest in males aged 20-34.

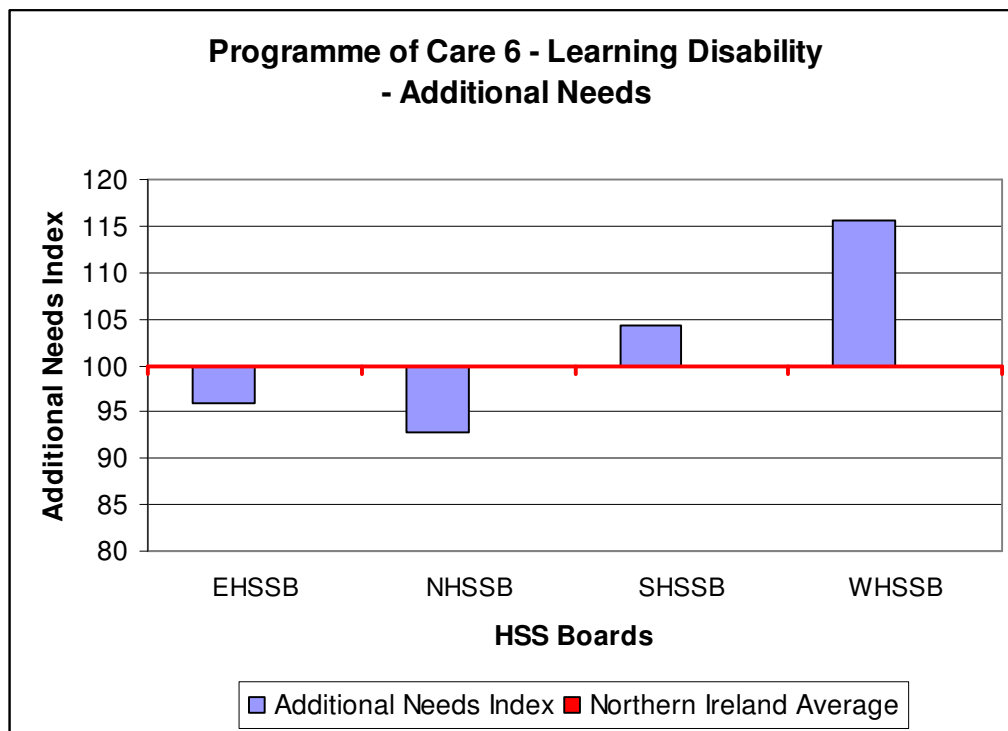
Age/Gender Relative Costs				
	0 to 19	20 to 34	35 to 49	50+
Male	23.35	36.21	33.27	19.49
Female	14.33	25.71	27.06	15.86

Additional Needs Index PoC 6 – Learning Disability:

The needs index information below is derived from a statistical modelling exercise using Northern Ireland data. The needs index is a composite index made up of the following three variables:

- ‘Proportion of households with no central heating’
- ‘Proportion of persons aged 16-74 with no qualifications’
- ‘Proportion of children in disability living allowance households’.

At a Northern Ireland level the needs index is 100. HSS Boards with a value greater than this have a need for learning disability services greater than the NI average whilst values less than this indicate a need less than the NI average.



The chart above shows that Western Board has the greatest additional need index relative to the other Boards

Relevant Research:

“Modelling the Distribution of Services for People with Learning Disabilities in Northern Ireland” (2004) - SECTA/ MSA Ferndale.

A1.8– PoC 7 - Physical & Sensory Disability - Summary

2008/09 POC Expenditure Weights: 3.49%

Age/ Gender Weightings:

The weights shown in the table below were constructed from the 1990 Policy Planning and Research Unit Disability Survey (1990). It can be seen that females aged 45-64 have are given the highest weighting in this programme of care.

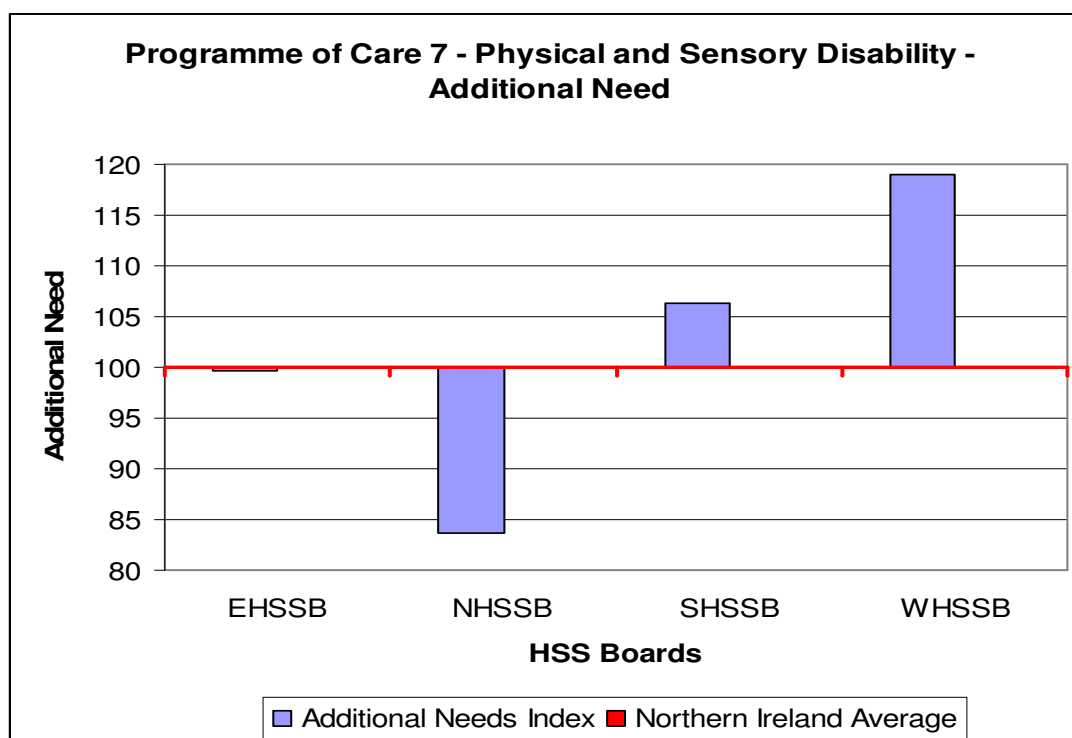
Age/Gender Relative Costs			
	0 to 24	25 to 44	45 to 64
Male	7.58	10.41	29.61
Female	6.17	13.06	36.25

Additional Needs Index PoC 7 Physical & Sensory Disability:

The needs index information presented below is derived from a statistical modelling exercise using Northern Ireland data. The needs index is a composite index made up of the following three variables

- ‘Proportion of persons aged 18-64 in disability working allowance households’,
- ‘Proportion of persons under 65 with a limiting long term illness’,
- ‘Noble Income Score’.

At Northern Ireland level the needs index is 100. HSS Boards with a value greater than this have a need for physical and sensory disability services greater than the NI average whilst values less than this indicate a need less than the NI average.



The chart above highlights that the Western Board has the highest additional need in this programme of care. Eastern Board is slightly below the Northern Ireland average.

Relevant Research:

“Modelling the Distribution of Services for People with Physical and Sensory Disabilities in Northern Ireland” (2004) - SECTA/ MSA Ferndale.

A1.9 – PoC 8 Health Promotion & Disease Prevention - Summary

2008/09 POC Expenditure Weights: 1.88%

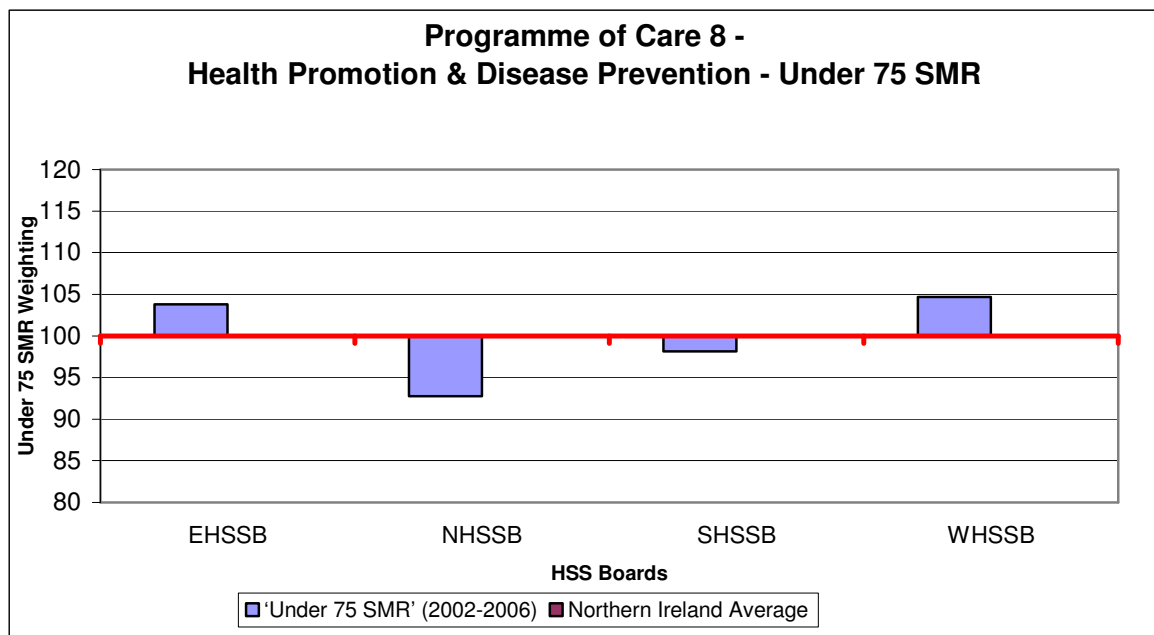
Age/Gender Weightings:

No specific age/gender weighting is used. Resources are allocated on the basis of equal shares for all age groups within the total population.

Additional Needs Index PoC 8 Health Promotion & Disease Prevention:

The needs index applied is the 'under 75' Standardised Mortality Ratio (SMR). HSS Boards with a value of more than 100 have a higher than expected death rate for this age group whereas a value of less than 100 indicates a lower than expected death rate. The under 75 SMR is considered to be a good proxy for morbidity in an area. It can be seen from the graph below that Northern and Southern Board have a need lower than the Northern Ireland average while Western and Eastern Board have a greater need.

Note: 'under 75' SMR to be updated on an annual basis



Relevant Research:

Specific research into this programme of care has not been undertaken by CFRG since its formation. This is due to the comparatively smaller percentage spend on this PoC in relation to the other programmes of care.

A1.10 – PoC 9 - Primary Health & Adult Community - Summary

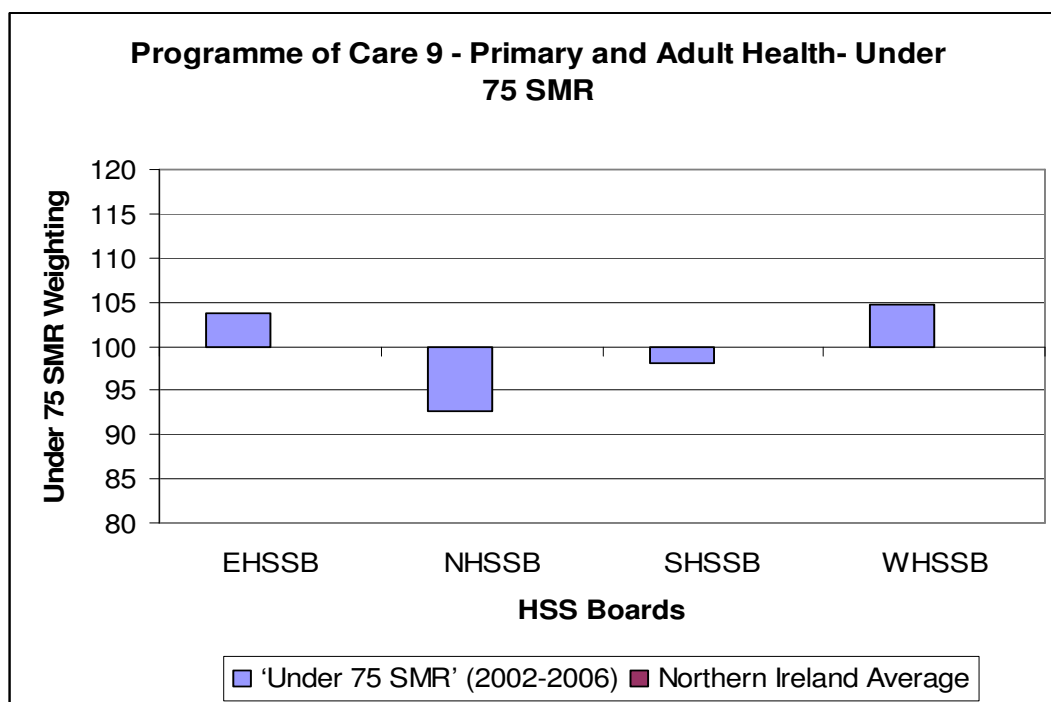
2008/09 POC Expenditure Weights: 3.62%

Age/Gender Weightings:

No specific age/gender weighting is used. Resources are allocated on the basis of equal shares for all age groups within the population aged 16-64.

Additional Needs Index PoC 9 – Primary Health & Adult Community:

The interim needs index applied is the 'under 75' Standardised Mortality Ratio (SMR). HSS Boards with a value of more than 100 have a higher than expected death rate for this age group whereas a value of less than 100 indicates a lower than expected death rate. The under 75 SMR is considered to be a good proxy for morbidity in an area.



Note: 'under 75' SMR to be updated on an annual basis

Relevant Research:

Specific research into this programme of care has not been undertaken by CFRG since its formation. This is due to the comparatively smaller percentage spend on this PoC in relation to the other programmes of care.