Department of
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An Roinn
Sláinte, Seirbhísí Sóisialta agus Sábháilteachta Poiblí

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Review of the Northern Ireland GMS Global Sum Formula

Supplementary Technical Document

Northern Ireland GMS Working Group
18 September 2007

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SECTION A: PROCESS OF THE REVIEW

1. INTRODUCTION

1.1 In February 2003, the NHS Confederation and the General Practitioners Committee (GPC) of the British Medical Association (BMA) jointly published "Investing in General Practice: The New General Medical Services Contract" which set out the details of the new GMS Contract following the outcome of their negotiations over the previous 16 months.

1.2 The new contract agreement included movement from the old Red Book remuneration arrangements of fees and allowances to a practice-based contract with core investment via a global sum, distributed in line with weighted needs of patients to reflect practice workload, complexity and the relative costs of service delivery.

1.3 The current GMS global sum formula provides the basis for distribution of global sum payments by calculating each practice's fair share of the total global sum resource. The formula did not determine the total global sum resources available nationally. Similarly, this Review does not determine future funding envelopes.

1.4 The original UK formula was developed with support from a number of academic teams including Professor Roy Carr-Hill of York University. During this original formula development, a NI GMS Working Group was established in Northern Ireland to test, under statutory equality obligations, each element of the formula and recommend evidence-based refinements where necessary to avoid or minimise adverse impact across any of the equality dimensions covered by section 75 of the Northern Ireland Act 1998. The findings of this NI GMS Working Group led to some divergence from the UK formula.

1.5 The current global sum formula in operation in Northern Ireland takes account of 6 key determinants of practice workload and circumstances. Appendix A presents the core findings from the analysis used to derive the current NI global sum formula.

(i) Patient gender and age for frequency and length of both surgery consultations and home visits. This age-gender workload curve is Northern Ireland specific; based on consultations and home visits from the NI Continuous Household Survey. Length adjustments are applied based on other UK research.

(ii) Patient gender and age for nursing and residential consultations. The UK research behind this adjustment shows these consultations to be an average of 1.43 times higher than surgery/home consultations by age and gender band.

(iii) Morbidity and mortality. The additional needs index is Northern Ireland specific; derived from a database comprising Census 2001 data, multiple deprivation indicators, standardised mortality ratios and health and socio-economic indicators from the Northern Ireland Health & Social Wellbeing Survey.

(iv) Newly registered patients. The UK research determined that these patients generate around 40% more workload in the first year than the average.

(v) Unavoidable costs of rurality. The rurality index is Northern Ireland specific; derived from modelling GP payments using Census 2001 data, mortality indicators, health

factors and social security indicators and measures of rurality such as density, dispersion and absence or proximity to other medical facilities.

(vi) Unavoidable higher costs of living through a Market Forces factor applied to the costs associated with employing practice staff. Although it was generally agreed that this adjustment was unlikely to be necessary in Northern Ireland; as there was no evidence to disprove the NI weightings set out by the GB research, this adjustment was applied pending further evidence.

2. REVIEW PROCESS

2.1 After publication of the new Contract proposals in 2003, GPs expressed some serious concerns with different aspects of the formula, the data used to inform it and the data applied to determine practices' global sum allocations. In response to these concerns about the accuracy and robustness of the current formula, the negotiators moved to reassure the profession and the NHS by promising that the formula would be reviewed in light of the developing contract and the availability of additional data.

2.2 The Formula Review Group (FRG) was established in December 2004 to:

- Undertake a thorough review of the payments for GMS essential and additional services;
- Examine the current global sum formula, including all factors currently included, and investigate additional factors for possible inclusion or exclusion in a revised formula, subject to evidence;
- Propose to plenary any necessary revisions to the current allocation formula, taking account of evidence and resources.

2.3 The FRG consisted of representatives from the BMA's General Practitioners' Committee (GPC), the NHS Employers, the 4 Health Departments and academics. It was agreed that the FRG would produce a report during 2006 for consultation in 2007 and that recommendations would be put to plenary, who would make the ultimate decision regarding any formula revisions and their implementation in April 2008.

2.4 Northern Ireland was represented on the FRG and representatives were aware of the ongoing research, analysis and potential proposals and revisions arising from the FRG work. During this period, NI undertook preliminary exploratory work and then on receipt of the FRG consultation report and recommendations, each element of the formula was tested using NI data. In some cases the equivalent data sources were not available for N Ireland, and therefore revised elements could not be developed based on the new methodology proposed by FRG. In these cases current adjustments were simply tested against the FRG recommendations. Where possible, current adjustments would be updated with the most recent data available. This Report is now the result of testing each element and recommends refinements where necessary, either to meet statutory equality obligations or to better reflect GMS workload in N Ireland.

3.2 STRUCTURE OF REPORT

3.1 The factors in the current formula can be divided into 2 types: workload factors and costs factors. This Report is structured in this fashion.

3.2 Workload factors are those that impact upon the workload of a practice, or the time required to provide care to patients. These are often related to the types of patients seen by the GPs in the practice and account for the fact that some types of patients impose a higher workload. Like the original formula development, the working assumption of this Review is that the elderly have a greater need for health care and so will generate more practice workload and will require a greater share of the relative resources. Likewise areas of higher deprivation, which although generally have lower proportions of elderly patients, will have higher levels of illness and subsequently higher health care needs, again generating more workload and therefore requiring a greater proportion of relative resources. Workload factors are described in Chapter 4.

3.3 Cost factors are those that impact upon the expenditure needed to be incurred by a practice to deliver services to its patients. Cost factors are described in Chapter 5.

3.4 Each chapter considers; the current adjustments used in N Ireland and their limitations, the UK FRG recommendations and the feasibility of developing the same or similar adjustment in N Ireland, and the recommendations of the NI GMS Formula Working Group having equality tested the recommendations and modelled the distributional impact of the FRG recommendations compared to the NI Group recommendations.

SECTION B: FINDINGS OF THE NI GMS FORMULA REVIEW

4. REVIEW OF WORKLOAD FACTORS

Current workload adjustments for age, need, list turnover & homes

4.1 The current NI global sum formula makes adjustments for 4 practice workload factors:

- The age/gender mix of the practice population
- The nursing and residential home population of the practice
- The number of new registrations in the practice population
- The additional needs of the practice population

4.2 An outline of the research underlying these adjustments is available at Appendix A.

Age/gender Adjustment

4.3 The age/gender adjustment reflects the effect of patient age and gender on workload. This adjustment was developed in-house by the DHSSPS and uses data from the Continuous Household Survey on frequency of surgery consultations and home visits along with other data sources to account for length of consultations or home visits. The current adjustment consists of 7 age bandings for each gender.

Nursing & Residential Homes Adjustment

4.4 This adjustment reflects the additional workload associated with patients in nursing and residential homes and was developed by Professor Roy Carr-Hill as part of the UK global sum formula development. The adjustment was based on 2 separate surveys: one survey of home managers used to measure age and gender specific consultation rates; and a second survey of GPs to estimate consultation length and travelling time.

Number of New Registrations in the Practice Population/List Turnover

4.5 Using data from the General Practice Research Database (GPRD), Professor Carr-Hill developed an adjustment which reflects the extra practice workload associated with newly registered patients and list turnover.

Additional Needs Adjustment

4.6 This adjustment reflects the other patient characteristics which influence workload. This was developed by Deloitte & Touche using data on GP consultations from the N Ireland Health and Social Wellbeing Survey. Using GP consultation data and area level data on morbidity, mortality, socio-economic circumstances and deprivation, they found that, of the variables tested, variations in workload over and above age and gender were best explained by: standardised limited long-standing illness (SLLI), standardised self-assessed health "not good" (SSAH), unemployment rate (UNEMP) and single carer households (SCHH). An adjustment based on these variables was created accordingly.

Limitations of the Original Approach

Age/Gender Curve

4.7 All datasets have limitations and in the case of using survey data from the Continuous Household Survey to derive the age/gender curve; it is acknowledged that self-reported consultations may be less accurate than administrative data direct from GP clinical systems.

4.8 Note that despite this limitation, the self-reported CHS data was considered more accurate than the counting of "file openings" in the General Practice Research Database as used to derive the adjustment in England. Usually survey data has the limitation of having seasonal effects but this is eliminated in the CHS due to spreading the fieldwork across the year. The N Ireland length adjustments were also open to much less criticism than the English equivalents.

Additional Needs Index

4.9 A number of limitations have been identified regarding the development of the N Ireland additional needs adjustment:

- The NI Health & Social Wellbeing Survey data on GP consultations was based on patients' self reports which may be less accurate than administrative data from GP systems;
- Survey respondents were only asked the number of consultations in the previous 2 weeks which raises the issue of seasonal effects which can influence the analysis;
- The NI Health & Wellbeing Survey did not take account of consultations with practice nurses. If the ratio of practice nurse to GP consultations is lower in certain areas, then the original research would have overestimated the strength of the additional needs adjustment on the workload of the primary care team and vice versa.

4.10 Note again that despite these limitations, the NI research raised less concerns than the English equivalent which had all the above limitations plus additional issues regarding a large number of wards that had to be excluded due to small numbers. In N Ireland, analytical methods were employed to deal with the issues around small wards with small observations that would be subject to large fluctuations.

Combining the Workload Adjustments

4.11 The separate estimated factors of workload were then combined by multiplying each element together. A limitation with such an approach can be double counting, as occurred in the English adjustments in terms of double counting nursing and residential home patients. No double counting occurs in the NI workload adjustments as the

surveys only cover private households and will not have counted consultations in nursing or residential accommodation.

Formula Review Group Recommendations

4.12 The FRG agreed to base its recommendation for a workload adjustment in the revised global sum formula on a multivariate regression analysis linking practice workload to a full range of patient and practice characteristics. The FRG commissioned QResearch at the University of Nottingham to develop a model which would explain variations in workload in terms of patient, local area and practice level indicators.

4.13 QResearch had a number of benefits over the original UK research; it is a large database of over 3 million patients, records actual consultations as opposed to file openings, includes practice nurse consultations. The multivariate approach is less likely to lead to double counting and contains data for a full year eliminating seasonal effects. Thorough validation with other data sources has demonstrated that the sample is representative and that results are likely to be generalisable.

4.14 The FRG were keen to consider models that used QOF prevalence to predict workload particularly as the original negotiators had stated that the formula should be reviewed in light of availability of additional and/or better data. However, practice level models tended to produce counter-intuitive results, for example, consultation rates falling with increasing prevalence of some important chronic diseases. QResearch recommended models using patient-level data but these are not yet feasible to implement as the Exeter System cannot link patient-level QOF data to all other patient-level characteristics used in the formula. Connecting for Health has been asked to review the technical changes required to make this possible. Further discussion would also be required on the political issues of making global sum payments on the basis of some clinical areas and not others, plus the issue of double payments given that QOF affects practice workload. These same issues would apply if such models were to be considered for implementation in N Ireland.

4.15 The FRG also considered the potential for including an adjustment for patients speaking a different language to their GP or health care professional. Direct information on the numbers of these patients was not available and further difficulties exist in terms of devising an appropriate weight. The FRG therefore agreed that it would be impossible to manage such a factor except at local level.

4.16 The FRG therefore recommended a workload adjustment based on 14 age/gender bands, newly registered patients within the last 12 months and the Index of Multiple Deprivation health domain score for the patient's electoral ward of residency. Within the payment system (Exeter) the adjustment will be calculated at patient level but as the process does not involve the transfer of patient-level data, patient anonymity is not compromised.

Feasibility to Develop a Northern Ireland-specific Workload Adjustment

4.17 The QResearch database does not contain data from any NI GP practices and therefore it was not possible to carry out NI-specific analysis. Likewise, we do not have a dataset in NI equivalent to QResearch and therefore we could not carry out multivariate regression modelling. Therefore it was not possible to develop a model which is comparable in scope to the QResearch model. Note that the proposed GMS Information System currently being developed by the Central Services Agency would allow such analysis. Note that data available for modelling from this source is still some

way in the future. See Appendix B for an outline of the proposed GMS Information System.

4.18 Currently the only source of GP consultation rates in N Ireland is from survey data. It is now possible to update the current NI age/gender curve to include the most up-to-date data (3-year average 2003/04 to 2005/06) and to include practice nurse consultations. It is acknowledged that survey data is considered less accurate than data direct from GP clinical/administrative systems.

4.19 The current NI additional needs index was derived using data from the NI Health & Social Wellbeing Survey 1997. Although this survey was repeated in 2006, the question on consultations no longer distinguishes GP consultations separately from other doctors and no longer measures number of contacts just that, at least one occurred. Although the CHS continues to include this question and in the correct format, this is not a Health Survey and Central Survey Unit's confidentiality regulations would not allow for data to be released at electoral ward level. Modelling of the additional needs index therefore cannot be reviewed and we must acknowledge that the current data source from which this is derived is nearly 10 years out of date.

4.20 The current NI additional needs adjustment which would have to be retained if the FRG recommendations were not adopted; is based on socio-economic variables attributed to practices via the patient postcode. Firstly, socio-economic variables can only ever act as proxies for healthcare needs. Secondly, this attribution process is not particularly accurate as it assumes that each patient within a ward has uniform characteristics. It would be more accurate to base any adjustment on actual observed characteristics of the patients. This depends critically on the ability to generate data at practice level; not only is the availability of such data still some way off but technical changes would be required for implementation.

Limitations of the QResearch Model & Its Application in N Ireland

4.21 The QResearch database has a constrained choice of additional needs indicators. It had been hoped that a range of morbidity, mortality and socio-economic indicators could be modelled along with the consultation data; however, needs indicators were limited to the Townsend Score or the Index of Multiple Deprivation (IMD). Separate models were tested using both indicators; with the IMD Health Domain models being chosen due to this indicator being more health-focused.

4.22 The IMD Health Domain in operation in N Ireland is based on slightly different variables from the IMD Health Domain developed for England. The English Health Domain contains a measure of emergency admissions to hospital, which the NI Health Domain omits. Likewise the NI Health Domain contains a measure of cancer incidence which the English Domain does not include. The English work has modelled the 2000 Index of Multiple Deprivation but the FRG propose to apply the model weights to the up-to-date 2004 scores – this is justified on the grounds that both indices (although comprising different indicators) measure relative illness and disability deprivation. The same argument would apply if we were to apply the FRG workload factor in N Ireland in that the Health Domains for both England and N Ireland comprise different indicators but essentially measure the same thing. However, there is still doubt over the appropriateness of applying the QResearch weights in N Ireland as the current NI Health Domain may be deemed to be more mortality than morbidity/illness related and therefore not measuring the same thing.

4.23 Before even considering the distributional impact that applying the FRG proposed workload factor would have in N Ireland; it is important to note that the adjustment has been derived from data sources which exclude N Ireland and would not have any elements specific to N Ireland GMS workload. This coupled with the Health Domain issue already makes its adoption seem unsuitable in N Ireland. It is also worth noting that the current NI workload adjustments came under much less criticism than the English equivalents and so the need for revisions is less great.

N Ireland Recommendations for Updated Workload Adjustments

Age/Gender Workload Curve

4.24 Given the limitations with regard to developing a multivariate workload model for N Ireland, the issues with application of the FRG workload factor in N Ireland and the constraints on reviewing the current adjustments; we have updated the workload factors where possible. Analyses of surgery consultations have again been based on the Continuous Household Survey (CHS) but have been updated from the 3-year average 1999/00 to 2001/02 to the most recent 3-years available 2003/04 to 2005/06. The adjustment for length has again been derived from a Scottish research study. The number of home visits has been estimated from the CHS but age/gender relativities applied that were derived from a UK study. Length has again been estimated from the 1992/93 GP Workload Survey. Combining the length-adjusted surgery consultations with the length-adjusted home visits produces the age/gender workload index as set out in Table 4.1. For further details on the evidence underlying these adjustments including comparison with the UK, see appendix C.

Table 4.1 Revised Age/Gender Workload Index (males aged 5-15 = 1)

	0-4	5-15	16-44	45-64	65-74	75-84	85+
Males	2.71	1.00	1.56	4.28	6.01	7.80	9.54
Females	2.82	1.21	3.86	5.26	6.85	8.12	11.06

Nursing & Residential Homes

4.25 There will be no revisions to the nursing and residential home adjustment. A factor of 1.43 would therefore continue to be applied in respect of each patient in a nursing or residential home.

List Turnover

4.26 Likewise there would be no revisions to the list turnover adjustment. An average uplift factor of 1.46 would continue to be applied in respect of all new registrations.

Additional Needs

4.27 There would be no change to the additional needs index which would continue to be explained by the following formula:

Practice List * (19.582 + (0.195 * SLLI) + (0.271 * SSAH) + (0.049 * UNEMP) – (0.024 * SSCH)

Equality Impact Testing

4.28 Equality analysis has been carried out at electoral ward level to test whether moving from the current Northern Ireland workload factors to the proposed FRG single workload factor has any adverse impact on any of the eight equality dimensions for which we have ward level data (data is unavailable for sexual orientation). The data sources for the equality dimensions are detailed in Appendix D. For each formula, the percentage share of the weighted registered list in each ward is calculated. We can

then compare whether each ward gains or loses in ward share when moving from the current NI formula to the proposed FRG workload formula. The analysis by equality dimension then looks at the percentage of each grouping that live in the wards that gain or lose in share. Given the nature of the formula we would expect some differential impact but not adverse impact across the equality dimensions.

4.29 The equality analysis shows that more elderly people live in wards that gain in share than other adults or children. At first glance this is as expected, given the elderly population's increased need for general medical services. However, the UK age element of the workload factor is less steep than the NI age curve and so in this case we would not have expected elderly wards to gain on moving from the NI to UK curve. In terms of religious belief, more Protestants live in wards that gain compared to Roman Catholics; however this is likely to be a reflection of the older age profile of the Protestant community and as already noted more elderly people live in wards that gain.

4.30 There are some adverse impacts on moving to the FRG workload formula for those with a disability or with a long-term limiting illness. The analysis shows that a greater proportion of people within these equality dimensions live in wards that will lose in ward share compared to those without a disability or long-term limiting illness. This would be contrary to what the formula should aim to achieve.

4.31 The above results require further investigation. There will be interaction between age and need which is not disaggregated in the above analysis as the workload factor is a single index comprising both elements. There may also be an issue with the use of the NI IMD Health Domain in that it is more mortality orientated than the English equivalent and may therefore be more focused on elderly areas which in general are less deprived. Distributional impact analysis should help to confirm these findings.

Distributional Impact of the UK Recommendations Versus Updated NI Adjustments

4.32 We have modelled the distributional impact of the proposed UK overall workload adjustment versus the combined updated workload elements (age/gender, list turnover, nursing/residential home patients and additional need) of the current NI global sum formula. The workload index implied by the QResearch model was compared to the results of applying the combined updated NI adjustments to the same patient characteristic data at 1st October 2006. All the analyses show the projected distributional impact of moving from the current NI adjustments (updated where possible) to a QResearch workload factor adjustment.

4.33 The analysis considered the impact of the proposed workload factor upon all practices and also the impact of particular groupings of practices that were considered to be of specific interest. These groupings were determined by:

- List size
- Number of GPs
- Standardised limiting long-standing illness scores
- Proportion of new registrations
- Proportion of patients living in nursing and residential homes
- Proportion of patients aged over 65
- Average distance to an urban centre of 50,000+ people
- Proportion of patients living 3 or miles from their practice of registration

4.34 The modelling presented in Table E.1, Appendix E shows the projected distributional impact of the UK proposed workload factor compared to the updated NI combined workload adjustments. A guide to these distributional impact tables can also be found at Appendix E.

4.35 The analysis suggests that adopting the FRG recommendations would lead to considerable changes in weighted patients for many NI GP practices. It is anticipated that:

- Overall 6% of global sum would be redistributed at practice level, this equates to £5.1m of global sum monies for 2006/07.
- 54% of practices would gain weighted patients and 46% of practices would lose weighted patients.
- The change in weighted patients would range from -31% to +67%. Excluding the 5% most extreme practices (2.5% at each extreme), the range would still be wide, at -26% to +48%.
- 50% of NI practices are expected to have a change in weighted patients between -8% and +9%. 70% are expected to have a change between -16% and +14%. 80% of NI practices are expected to have a change in weighted patients of +/-20%. 90% of practices will have a change between -23% and +28%.
- There would be significant redistributive effects across practice cohorts, as summarised in Table 4.2.
- Compared to the current workload elements of the NI global sum formula, the FRG recommendations would on average tend to decrease the weighted share of practices with high additional need due to ill-health and deprivation. This unexpected relationship, which is in line with the equality analysis results, requires further investigation.
- The NI-specific age/gender curve is much steeper than its UK equivalent and so places more weight on elderly patients. Yet moving to the UK curve from the NI curve increases the weighted share of practices with higher proportion of elderly patients. Again this unexpected result is in line with the equality analysis and requires further investigation.

Table 4.2 Redistribution across practice cohorts

Cohort Category	Average % Change in Weighted Patients	
	Lowest Quartile of Practices	Highest Quartile of Practices
List Size	-1.53%	-0.27%
Number of GPs	-0.95%	-0.01%
SLLI	+12.3%	-19.5%
Distance to Urban Centre	-11.9%	+2.6%
Distance to GP Surgery	-3.4%	+5.7%
% of Patients aged >65	-7.1%	+4.4%
New Registrations	-10.7%	+2.9%
Nursing/Res Home Patients	-6.6%	+5.2%
Index of Multiple Deprivation	+10.1%	-16.9%

4.36 The above results required further investigation of the relationship between age/gender and additional need. The modelling presented in Table E.2, Appendix E shows the projected distributional impact of the UK proposed age/gender index compared to the updated NI age/gender index. Table E.3, Appendix E considers the impact of need separately.

4.37 In terms of age/gender, it is anticipated that:

- Overall 0.6% of global sum would be redistributed at practice level, this equates to £492k of global sum monies for 2006/07.
- The change in weighted patients across all practices would range from -4.75% to +6.5%.
- There would be only small redistributive effects across practice cohorts as summarised in Table 4.3.

Table 4.3 Redistribution across practice cohorts – age/gender index

Cohort Category	Average % Change in Weighted Patients	
	Lowest Quartile of Practices	Highest Quartile of Practices
List Size	-0.79%	-0.36%
Number of GPs	-0.38%	-0.09%
SLLI	-0.85%	+0.73%
Distance to Urban Centre	-0.06%	+0.42%
Distance to GP Surgery	+0.14%	+0.23%
% of Patients aged >65	+1.41%	-1.51%
New Registrations	-0.49%	+0.39%
Nursing/Res Home Patients	+0.70%	-0.50%
Index of Multiple Deprivation	-0.99%	+0.59%

4.38 When the age element of the workload factor is examined separately, it appears that the age element is having little effect on the overall redistribution that would result from adopting the FRG recommendations. Adoption of the FRG recommended age element compared to the updated NI age index would see a decrease in the weighted share of practices with the highest proportion of elderly patients – intuitively this is expected as the UK age curve is less steep in terms of weighting for the elderly than the NI age curve.

4.39 In terms of additional need, it is anticipated that:

- Overall 5.3% of global sum would be redistributed at practice level, this equates to £4.5m of global sum monies for 2006/07.
- The change in weighted patients across all practices would range from -32.4% to +30.4%.
- There would be significant redistributive effects across practice cohorts as summarised in Table 4.4.

Table 4.4 Redistribution across practice cohorts – additional needs index

Cohort Category	Average % Change in Weighted Patients	
	Lowest Quartile of Practices	Highest Quartile of Practices
List Size	-1.49%	-0.44%
Number of GPs	-2.19%	+0.37%
SLLI	+12.74%	-19.98%
Distance to Urban Centre	-12.01%	+1.91%
Distance to GP Surgery	-3.88%	+4.13%
% of Patients aged >65	-9.22%	+4.39%
New Registrations	-7.13%	+2.28%
Nursing/Res Home Patients	-7.16%	+5.26%
Index of Multiple Deprivation	+9.26%	-16.81%

4.40 Having separated age and need effects, we can confirm that the effects of the overall workload factor are attributable to the "need " element. Examining need separately still results in a decrease in the weighted share of practices with higher ill-health (SLLI) and higher deprivation (IMD). The original NI needs index comprised indicators which addressed health need and other socio-economic circumstances which contribute to ill-health. Moving to adopt the FRG proposal would mean adopting the NI IMD Health Domain, which is more mortality orientated and therefore more likely to be focused on elderly areas which are in general less deprived. Although both the original NI needs index and proposed workload factor contain a measure of age/gender standardised morbidity, the NI IMD Health Domain picks up more mortality and overrides the effect of morbidity.

4.41 Given the results of the equality testing and the results of modelling the distributional impact, the NI GMS Working Group consider the NI updated adjustments to be more appropriate than the FRG recommendations; as they are based on NI-specific data, are a better reflection of GMS workload in N Ireland, minimise any adverse equality impacts and produce a more equitable distribution of resources.

The N Ireland GMS Working Group recommends a revised global sum formula that includes an updated age/gender adjustment, calculated using the existing data sources and existing methodology. The Group recommends that the adjustments for list turnover, additional needs & nursing/residential homes continue unchanged.

5. REVIEW OF COST FACTORS

5.1 In addition to considering workload, the global sum formula must also reflect differences in relative costs of service delivery across practices. The formula currently does this through the use of a labour cost adjustment and an isolation/rurality adjustment.

Current Staff Market Forces Factor

5.2 The current global sum formula makes adjustment for a staff Market Forces Factor (MFF). The aim of the MFF is to reflect the geographical variation in staff costs that practices will incur. The adjustment is given a weighting of 48% as this was the average value of staff costs as a proportion of the global sum equivalent prior to the introduction of the new GMS Contract. This current weighting is subject to change based on availability of data such as the Expenses to Earnings Ratio calculated by the Technical Steering Committee using HM Revenue & Customs data.

5.3 The current staff MFF adjustment was developed by the Institute for Employment Research at the University of Warwick and is based on the New Earnings Survey Panel Dataset for 2001/03.

5.4 The equivalent earnings dataset for N Ireland was not amenable to similar analysis and so the MFF for N Ireland outside Belfast was taken to be the average between Scotland and Wales, that is, outside of Edinburgh and Cardiff respectively. The MFF for Belfast was taken to be the average between Edinburgh and Cardiff. The current weighting for outside Belfast is 0.885 and the weighting for Belfast is 0.91.

Formula Review Group Recommendations

5.5 The FRG decided that no improvements to the current methodology for the staff MFF were available other than that currently being investigated by the Advisory Committee on Resource Allocation (ACRA). Until ACRA's recommendations are available, the FRG recommend that the existing methodology is maintained and that the adjustment is updated with latest available data.

Application of a MFF in N Ireland

5.6 Whilst we were not able to replicate the work of Warwick University, we have been able to analyse data from the NI New Earnings Survey to explore whether there is a significant difference in average weekly earnings in Belfast versus the rest of N Ireland. Analyses covered differences between the public and private sectors, different industrial groups and different occupational categories.

5.7 The findings show that public sector average gross weekly wages are not significantly different in Belfast compared to the rest of N Ireland. In fact, in the public sector average earnings are higher in the rest of N Ireland than Belfast (Figure 5.1). Average earnings are significantly different in the private sector, with private sector wages being much lower outside Belfast. Within the health and social work industry, weekly earnings are not significantly different amongst full-time employees in Belfast compared to the rest of N Ireland. Weekly earnings are not significantly different within public sector administrative occupations comparing Belfast and the rest of N Ireland. Outside Belfast, private sector earnings are actually lower than public sector earnings. See Table 5.1.

Figure 5.1 Average Gross Weekly Earnings

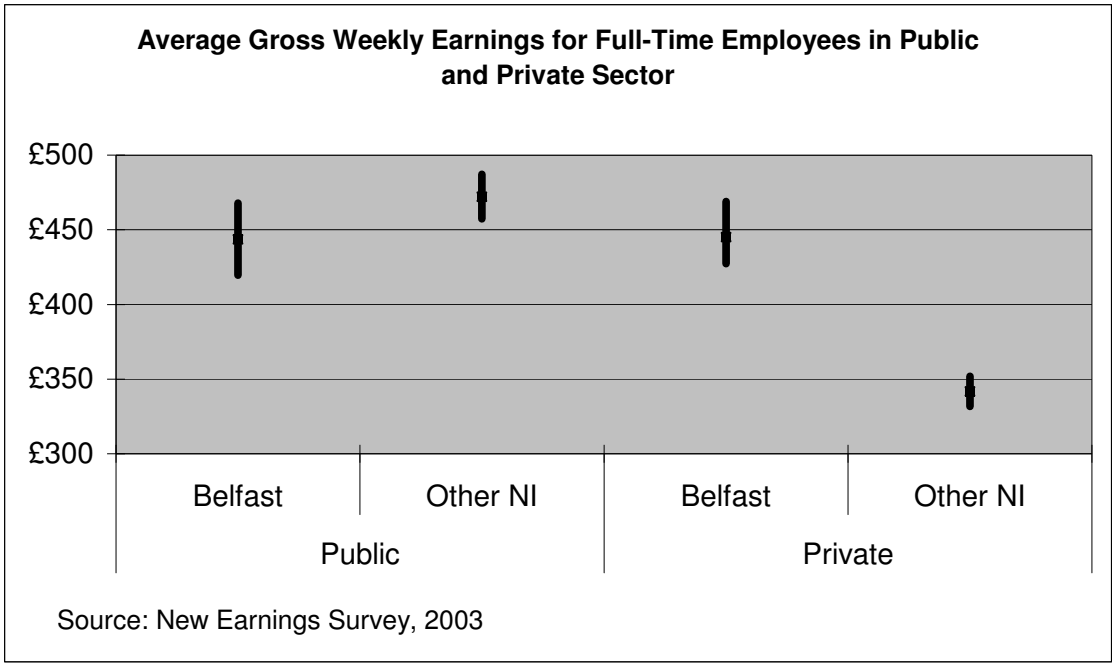


Table 5.1 Summary of NI New Earnings Survey Analysis

Sector	Difference in Belfast versus Other NI	Area in which average wages are higher
Full-time Employees in Public Sector	Not significant	Other NI
Full-time Employees in Private Sector	Significant	Belfast
All Employees in Public Sector	Not significant	Belfast
All Employees in Private Sector	Significant	Belfast
All Employees Health & Social Welfare Occupations	Not significant	Other NI
All Employees Public Sector Administrative	Not significant	Belfast
All Employees Private Sector Administrative	Significant	Belfast

5.8 The creation of a MFF involves analysis of private sector employees, due to a number of reasons including inconsistent data on NHS staff turnover and perverse incentives because any rise in staff costs would feed directly into the MFF calculation. However, in establishing the need for such an adjustment, it is appropriate here to look at the application of this to public sector employees. A GP practice would be classified as public sector, and would include health and social welfare and administrative occupations. All analysis of breakdowns of occupations within these categories have resulted in not significant differences indicating that earnings in a GP practice should be similar between Belfast and the rest of N Ireland. Note the removal of the current MFF adjustment would redistribute only 0.2% of the global sum (equivalent to £170k of the global sum for 2006/07) from the Eastern Board to the remaining Boards. The Working Group therefore feels that there is no evidence to support a differential MFF across N Ireland and therefore the adjustment for staff MFF should be neutralised (i.e. set to 1.0 for all practices).

The N Ireland GMS Working Group recommends that a revised global sum formula should include a neutralised staff market forces factor adjustment.

GP Recruitment and Retention

5.9 One criticism of the current formula is that it potentially does not fully capture the higher relative costs of service delivery in deprived areas over and above the rurality and staff MFF adjustments. In particular, it does not allow for the additional costs of recruitment and retention that may be necessary to attract GPs to practices in relatively deprived areas. This is a distinct issue from the impact that deprivation has on service demand which is captured in the workload factor.

5.10 According to a BMA Survey in 2003, the GP vacancy rate in England was 4.5% (a 3.4% vacancy rate of 3 months or more) and these tend to be concentrated in particular areas. Previous research has shown that the greatest problems tend to be in urban and deprived areas. Levels of GP turnover are positively correlated with deprivation and in particular urban deprived areas tend to have the most long-standing vacancies.

Formula Review Group Recommendations

5.11 The FRG commissioned the Health Research Unit at Aberdeen University to establish whether recruitment and retention difficulties increase the relative costs of service delivery in deprived areas and therefore whether an adjustment would be appropriate and if so, to develop a methodology to derive such an adjustment.

5.12 The Aberdeen research quantified the relationship between indicators of GP recruitment and retention difficulties and possible explanatory variables. By essentially assessing the effect on GP recruitment and retention difficulties of GP relative earnings compared to other indicators such as deprivation, the change in earnings necessary to compensate other factors such as deprivation, could be estimated. After considering the Aberdeen analysis, the FRG recommended an adjustment based on the “narrow comparator standardised spatial wage differential” (SSWD). The SSWD is an estimate of the average differences in wages attributable to geographical location after taking account of age, gender, industry type and occupation. The narrow comparator SSWD takes into account the earnings of professionals similar to GPs. The recommended CORR adjustment also takes account of the average limiting long-term illness ratio for the practice.

Feasibility to Develop a GP Recruitment and Retention Adjustment in N Ireland

5.13 In N Ireland we were not able to replicate the work of Aberdeen University as the equivalent of SSWDs is not available for N Ireland. The availability of SSWDs would have allowed us to test if N Ireland had a similar spatial variation in pay to England. GP earnings data was also not available to test against private sector pay variations.

Limitations of the Aberdeen Model & its Application in N Ireland

5.14 The BMA Survey of 2003 indicated that N Ireland had a vacancy rate of only 0.2% (2 vacancies). GP turnover does not appear to be an issue in N Ireland; 89% of GPs are in the same practice at February 2007 as they were in August 2004. Only 7 GPs (0.6%) have moved practice during this period. During this period 8% of GPs have been removed from the medical list due to retirement, death or leaving N Ireland. In the same period we have seen a net gain of 26 GPs.

5.15 The main limitation of the Aberdeen model is that it is based on pre-contract earnings data and it could be argued that the nGMS contract has addressed some of the issues surrounding recruitment and retention problems. The model also assumes a fairly high

level of vacancies and recruitment and retention problems, which NI does not have. Therefore in principle, the CORR adjustment does not seem appropriate to Northern Ireland. In addition, given that we have no data to test the concepts of the Aberdeen model, the CORR adjustment also cannot be tested or applied to Northern Ireland.

The N Ireland GMS Working Group recommends that a revised global sum formula should not include a Cost of Recruitment & Retention adjustment.

GP Market Forces Factor

5.16 The FRG considered the introduction of a GP market forces factor (MFF) alongside the Cost of Recruitment and Retention (CORR) adjustment. However, the CORR adjustment uses a standardised spatial wage differential as an indicator of geographical differences in relative earnings. This is too similar to the GP MFF indicator to consider both without the risk of double counting. The FRG therefore recommended that a GP MFF should not be included in the revised global sum formula.

5.17 We are not recommending a CORR adjustment for Northern Ireland but have considered the merits of a separate GP MFF adjustment. As with the staff MFF, the GP MFF would use private sector pay comparisons to calculate an appropriate adjustment. However, the CORR research found that there is less spatial variation in GP earnings than in the private sector and that they bear little relationship to recruitment and retention problems. In addition, data from the NI Annual Survey of Hours and Earnings (formerly New Earnings Survey) shows no significant difference in gross weekly earnings of those in the Health & Social Welfare occupations in Belfast versus the rest of Northern Ireland. Given these findings and that we are recommending a neutralised staff MFF for this revised formula, we recommend that a GP MFF is not necessary for Northern Ireland.

The N Ireland GMS Working Group recommends that a revised global sum formula should not include a GP market forces factor adjustment.

Current Rurality & Economies of Scale adjustment

5.18 In addition to unavoidable labour costs, practices also face differing costs of service delivery due to rurality. The current rurality adjustment in N Ireland is intended to reflect the uncontrollable additional costs associated with the degree to which the area served is rural. The impact of rurality on costs was modelled in N Ireland using GP practice payment data. A range of rurality indicators (density, dispersion, proximity to GP and proximity to other medical facilities) were modelled against these payments whilst controlling for age, deprivation, list discrepancy (known in N Ireland to be correlated with rural areas), Board policies and staff market forces. The variables that determine the current NI rurality adjustment are:

- Distance to an urban centre of 20,000 or more people (-ve association; counter intuitive indicator but highly correlated with other rural variables and so retained in model)

- Distance to an urban centre of 50,000 or more people (+ve association)

- Proportion of patients living 3 or more miles from their GP practice of registration (+ve association)

- Average distance to the nearest A&E or Minor Injuries Unit (+ve association)

5.19 Unlike the original UK rurality model which was criticised for not taking account of economies of scale; the current NI rurality adjustment does take account of economies of scale by modelling without a control variable for practice list size. An outline of the research underlying the rurality adjustment is available at Appendix A.

Limitations of the Original N Ireland Approach to Rurality & Economies of Scale

Limitation 1:Unable to Model GP Expenses

5.20 Modelling of GP payment data allowed us to determine how much a practice was paid for carrying out GMS but without GP expenses data it was not possible to ascertain how much of the payment was expenses associated with delivering the service and how much was retained as profit. Unfortunately expenses data for GPs in N Ireland was not available from the Inland Revenue Inquiry at that time.

Limitation 2:Validity of Adjustment Based on Pre-Contract Payments

5.21 There is an issue around the validity of any analysis based on pre-Contract data as it is possible that to some degree the higher costs of rural practices are specific to the previous payment mechanism.

5.22 To test this issue we have run regression models excluding Rural Practice Payments from the pre-Contract Red Book total GMS payments. This results in models which have no significant rurality variables. This confirms that the rurality effect was simply a function of the previous payment mechanism, that is, there is a circular influence of including rural practice payments in the dependent cost variable. Once these rural payments are removed any rurality effect disappears.

5.23 To further test this issue, we updated the dependent variable with post-contract global sum payments. Note that this dependent variable is not appropriate because it results in a very high R^2 simply because the variables that come through in the model have been used in actually calculating the global sum and so they fully explain the dependent variable. However, we did switch off the rurality index to test the circular influence and again once rurality is excluded from the dependent payments variable, there are no significant rurality explanatory predictors.

5.24 In the original formula development it was agreed that in principle a rurality adjustment should be included – it was about acknowledging the need for such an adjustment in principle. However, as evidence now demonstrates that the rurality effect is only due to the circular influence of the historic payment mechanism, a decision is required whether the principle again should over-ride the evidence which actually does not justify such an adjustment.

Limitation 3:Validity of Mileage Variable as a Measure of Rurality

5.25 It could be argued that “distance to GP of registration” is not a good measure as patients may choose not to register with their closest practice. At the time of modelling, to construct the variable “% of patients living 3 or miles from their practice of registration” it was necessary to base this on claims submitted by GPs for rural practice payments. However, with the introduction of the new Contract and the global sum payment, rural practice payments were subsumed into the global sum as a read across

from Red Book payments to the block GS payment. GPs no longer therefore receive separate rural practice payments and subsequently do not have to make claims. The original data source therefore no longer exists.

5.26 The CSA in calculating the quarterly global sums had to find an alternative data source. Normally in resource allocation models, it would not be recommended that any one variable is changed either in terms of how it is constructed or how it is defined as technically this revised variable would most likely have led to a different model specification (different coefficients for all variables and a different R^2) if it had been included originally. However, this was the only practical solution.

5.27 The mileage variable now is constructed by calculating straight line distances based on postcodes from patient's postcode of residency to postcode of practice of registration. This results in reducing the redistributive effect of the rurality index from +/-2.4% to +/-1.64% (1.64% is equivalent to £1.4m of total global sum expenditure 2006/07). Note that although the straight line distances are more accurate than the GP claim data, this raises the issue of how valid this variable now is as a measure of rurality.

5.28 To test this issue we have run regression models substituting the original mileage variable (derived from claims) with a revised variable (derived from straight line distances between patient's residency and practice of registration) – that is, if the variable as constructed now had been available to us at the time of the original regression modelling. The regression modelling confirms that the variable as constructed from straight line distances would not be a significant predictor of unavoidable costs of rurality. It is no longer measuring rurality. The rurality index is now less redistributive due to picking up urban patients and urban travel distances.

5.29 Using the straight line distances, 67% of practices would have a higher % of patients living 3 or more miles from the practice. Remember that the claims data was reliant on GPs submitting claims and that practices were only eligible for a rural practice payment if at least 20% of their patients lived 3 or miles from the practice. Given this criteria many urban practices made few claims in the knowledge that they would not reach the 20% criteria. Using the straight line distances results in these practices having higher % of patients living 3 or more miles away but this simply picks up urban travel as well – in urban areas patients can still be 3+ miles from their surgery partly due to not registering with their nearest practice. This is particularly evident for practices in North and West Belfast who have large proportions of patients from Lisburn, Newtownabbey and Glengormley.

5.30 A number of alternative methods for constructing the mileage variable were explored including incorporating a rural/urban definition[$] and setting eligibility criteria based on % of patients 3 or more miles from the practice. The aim being to construct a variable closer to the claims data – and which would redistribute a figure closer to the original 2.4% than the redistribution of 1.64% which occurs with the variable as currently constructed. Applying the criteria that all rural practices should benefit plus urban practices with at least 30% of patients 3 or more miles away, created an index which redistributed 1.8%.

5.31 Removal of the mileage variable from the model (although obviously this is not recommended – full remodelling of the complete dataset would be required) depresses the index from an average index of 1.1124 to an average of 1.0664. Exploratory regression omitting these all mileage variables from the dataset resulted in no significant rurality predictors.

Limitation 4:Robustness of Economies of Scale Adjustment

5.32 The original UK modelling work indicated a strong diseconomies of scale effect at low list sizes but inclusion of such an adjustment was rejected due to the perverse incentive this could have created for practices to split or avoid amalgamation. In N Ireland, although an attempt was made to incorporate economies of scale, the method for doing so may not be as robust as preferred. No control for list size was applied, allowing the rural variables themselves to pick up any effect of list size. However, the ultimate aim should be to only adjust for unavoidable small scale rather than to reward practices for diseconomies when population dispersion and other causes of higher costs does not warrant this small scale. The FRG has therefore considered unavoidable smallness and rurality separately.

Formula Review Group Recommendations – Costs of Unavoidable Smallness

5.33 The FRG considered practices' costs of isolation and rurality and in order to address the criticism regarding economies of scale, they sought to develop a Cost of Unavoidable Smallness (CUS) adjustment. The FRG commissioned Deloitte to carry out research to estimate the unavoidable effect of geographically dispersed populations on the sizes and locations of GMS practices.

5.34 The aim of the research was to consider the extent to which diseconomies of scale would lead to practices serving rural areas having unavoidably higher costs and therefore a requirement for increased funding due to their small list sizes. Note that the principle was that the formula should only adjust for any losses of scale associated with rurality that are unavoidable and should not compensate practices for being small when the geographical dispersion of the population does not warrant this.

5.35 Unavoidable cost of smallness was defined as: "The unavoidable costs of serving geographically dispersed populations are the additional costs that practices incur when they are 'appropriately small' given their circumstances. A practice is 'appropriately small' if the disadvantages to patients resulting from a configuration with larger practice sizes would outweigh the cost savings resulting from larger practice size."

5.36 This definition requires an assessment of the trade-off between cost savings in practices and additional travel burden on patients. If the additional travel costs are greater than the economies of scale then the practice is deemed appropriately small. Deloitte's research was therefore two-fold comprising; (i) economies of scale analysis and (ii) analysis of patient travel distances, times and costs.

5.37 Based on Deloitte's report, the FRG recommended a Cost of Unavoidable Smallness adjustment based on 2 components: (i) economies of scale adjustment and (ii) isolation criteria. The formula and procedure for producing and applying these adjustments is discussed later.

Feasibility to Develop a Northern Ireland-Specific Smallness Adjustment

5.38 Note that N Ireland was excluded from the Deloitte modelling. Seeking to include NI data would have been disproportionately time consuming while adding only a small proportion of the total practice population to the analysis. Deloitte concluded that there did not appear to be any aspects of the geographical dispersion of population specific to N Ireland that would greatly influence a national formula and so it would be a disproportionate cost to pursue inclusion.

5.30 Initially the intention was to replicate the Deloitte work for NI practices to prove whether the Deloitte results are applicable in N Ireland. However, there were a number of issues with acquiring and analysing NI Inland Revenue GP expenses data; the details of these issues can be found at Appendix F. Also time and resources did not permit NI simulation modelling of patients' travel distances and therefore effect on patients' costs, due to changes in practice configurations.

5.31 It was therefore agreed that if NI analysis could show comparability to the GB results, there would be no reason to expect the Deloitte results to be inapplicable to N Ireland. The following sections cover NI analysis and comparisons with GB.

Economies of Scale Analysis for N Ireland Practices

5.32 The practice cost data readily available for analysis was the dataset previously used for the original rurality modelling; a dataset of total GP payments 2000/01 for 350 practices. The dataset also contained information on GP list sizes at June 2001. Average cost per patient was obtained by dividing total cost by list size. Appendix G shows summary statistics for cost data.

5.33 Variation in GMS costs is shown in Figure 5.1, which shows the cost per patient for each practice within each list size band. In addition, the mean practice costs for each band have been plotted to indicate the overall trend. Overall the graph shows a similar trend to the GB graph, with costs per patient falling rapidly as list size increases to approximately 1,900 and then as list size continues to increase beyond this point costs appear to remain approximately constant. Figure 5.2 shows variation in global sum costs and these show a very similar pattern to overall GMS costs.

5.34 In order to assess the magnitude of differences and thus the potential additional funding at small list sizes, we have analysed the differences in means across 3 list bands. The evidence supporting these cut-offs is given in Appendix G. These results are comparable with the GB analysis. Based on the NI analysis of the relationship between practice costs and lists sizes, we would not expect the Deloitte results to be inapplicable to N Ireland.

Figure 5.1 Variation in Total Costs per Patient

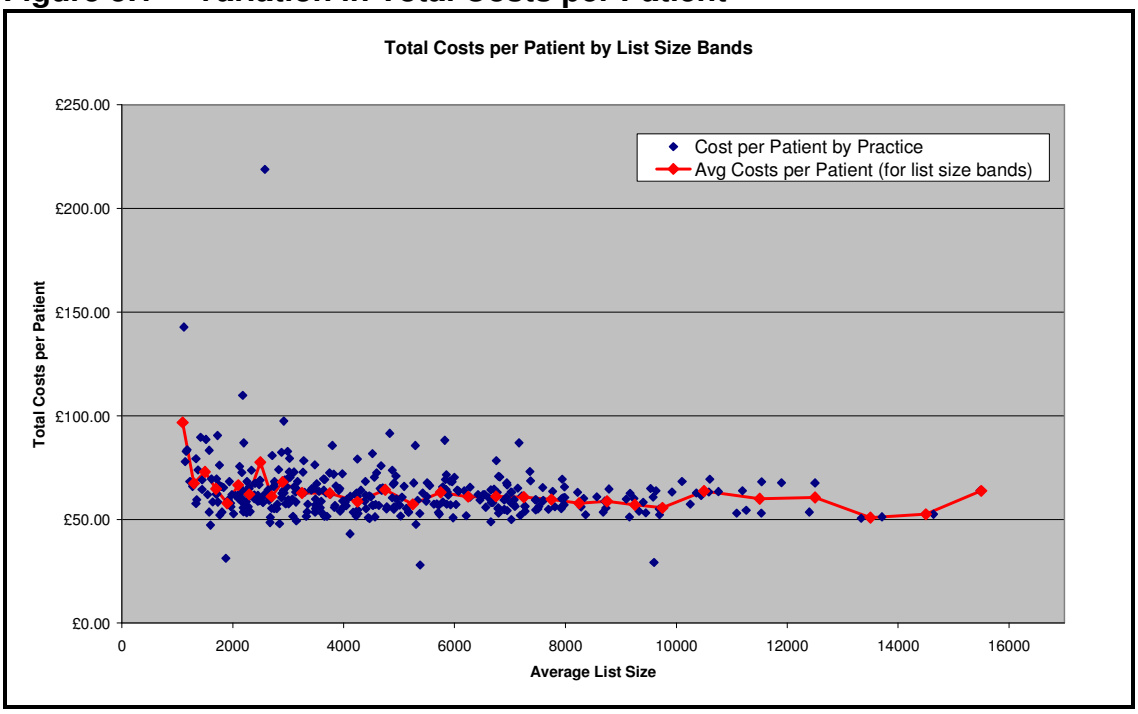
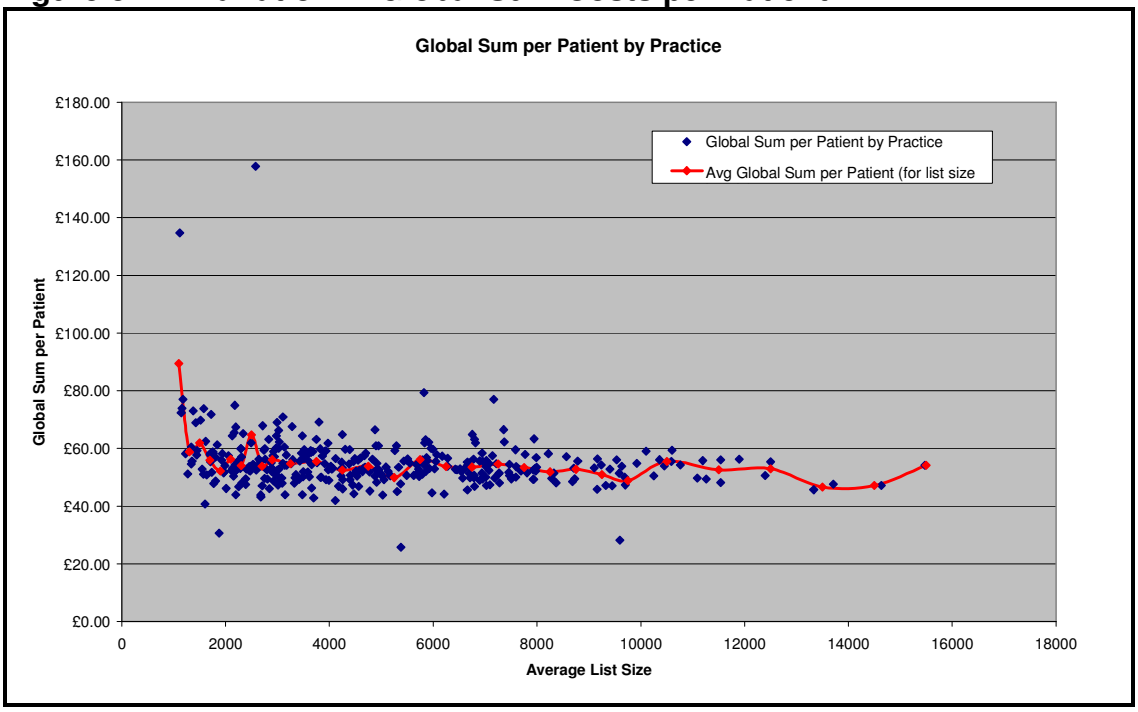


Figure 5.2 Variation in Global Sum Costs per Patient



Isolation Adjustment - Analysis of Patient Travel Distances, Times & Costs

5.35 The Deloitte Report suggested that beyond a list size of 1,900 there were no observable economies of scale effects on practice expenses per patient. The Report also suggested that only practices beneath this size that also meet criteria regarding "necessary smallness" should benefit from the economies of scale adjustment. To do this, they developed an isolation criteria, that qualifies the extent that a small practice can benefit from the economies of scale adjustment based on the degree to which its smallness is unavoidable. The Deloitte research identified that the likelihood that a practice is appropriately small, in that removing it would impose a large additional burden on patients, depends primarily on distance to the next nearest practice.

5.36 Deloitte used simulation modelling techniques to estimate the effect on patients' travel distances and times and therefore the effect on patients' costs, due to a new practice configuration. The approach examined the additional costs that would arise if there was no practice at a current location by analysing the effect of iteratively removing and merging each GP practice. The analysis assumed that if a GP practice were merged then its registered population at an output area level would be redistributed among other practices in the same proportion in which residents from the same output area are currently registered.

5.37 Deloitte's analysis concluded that only in rural areas, patient travel costs exceed potential practice savings on average. In other areas, there is limited scope for practice savings and these are approximately equal to any increase in patient travel costs. Deloitte went on to conclude that the best predictor of additional patient costs was "distance to next nearest GP practice".

5.38 Time and resources did not permit this simulation modelling for N Ireland. It was agreed that analysis of average travel distances to GP in N Ireland would be compared with the GB results. If the results are comparable, it was agreed that we would not expect the Deloitte isolation adjustment to be inapplicable to N Ireland.

5.39 Patient travel distances and travel times to their GP were calculated on the estimated travel distance from the Census Output Area in which the patient resides to the GP practice at which they are registered. The use of a Geographic Information System software application allowed total travel distance based on the road network to be calculated for each patient output area to GP practice pairing.

5.40 Figure 5.3 shows average travel distance to a GP practice by country and also travel distance to the nearest GP practice which is substantially lower than actual travel distances because people are often not registered with their nearest GP. Across GB patients on average travel 3.3km to their GP practice of registration; in N Ireland patients travel on average 3.7km to their practice, a comparable distance to the GB figures. In urban areas only 22% of patients visit their nearest GP practice whilst in rural areas this increases to 57%. Again these figures are broadly comparable with GB figures of 33% and 50% respectively. Rural areas have been defined as the 20% of practices with the lowest population density; density defined as the % of people living in enumeration districts with a density less than 4 people per hectare.

5.41 In rural areas, average travel distances to the GP increase substantially. Figure 5.4 illustrates that in the 20% most rural areas patients travel on average 5.64km to their GP, whilst in urban areas this falls to 3km. These figures are again comparable with GB where rural patients travel on average 5.5km, whilst urban patients travel on average 2.4km.

5.42 The range of alternative GP practices to patients living in rural areas is also substantially lower relative to those living in urban areas. On average patients from a single Census output area in rural areas are registered with 3 practices, in urban areas the figure is 12 practices. GB figures were 8 and 14 respectively.

Figure 5.3 Network Distance to a GP Practice by UK Country

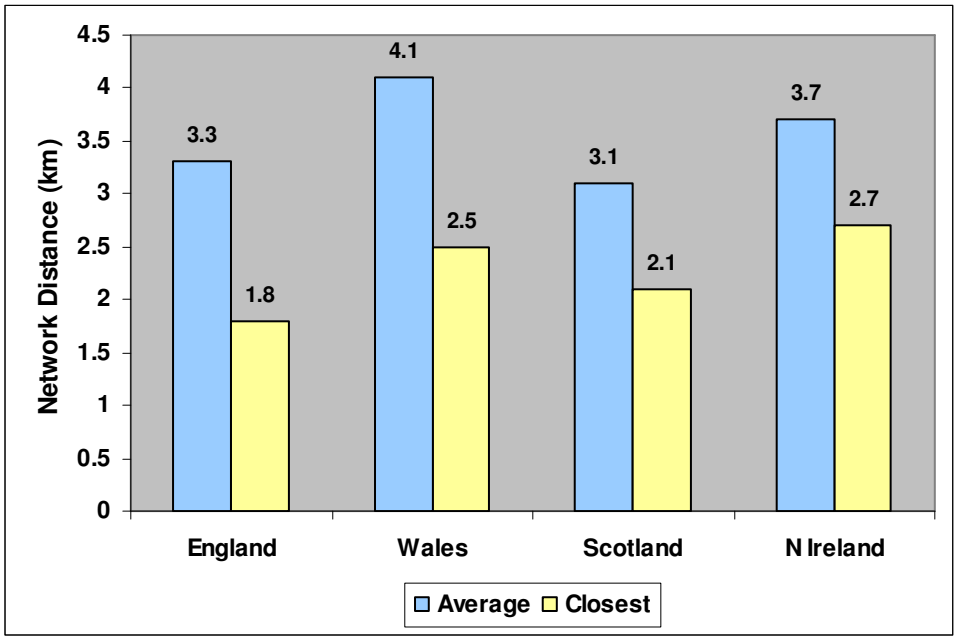
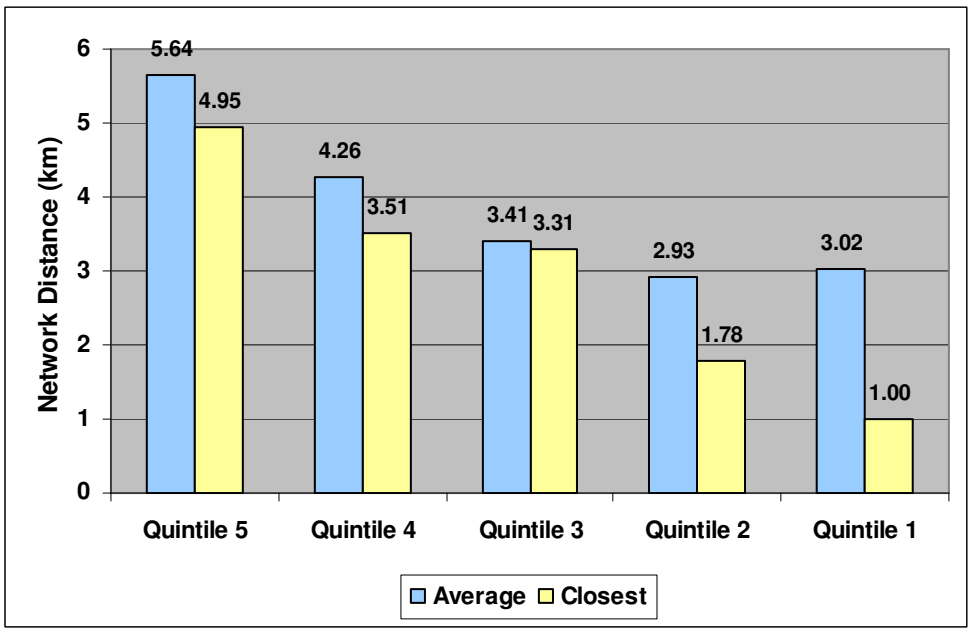


Figure 5.4 Network Distance to a GP Practice by Population Density Quintile – N Ireland



N Ireland Recommendations for Rurality & Smallness Adjustments

5.43 Given this NI analysis of average travel distances to GP and the comparability of these results to GB, we would not expect the Deloitte isolation adjustment to be inapplicable to N Ireland. We have therefore simply applied the Deloitte proposed adjustments to N Ireland practices and summarised the impact in terms of number of practices that would benefit and distributional impact.

Number of Practices Affected & Distributional Impact of Adjustments

5.44 The initial economies of scale adjustment for each practice would be calculated as follows:

$$\text{Initial Economies of Scale Adjustment} = \frac{35.15664 + \left[\frac{1}{\text{Listsize}} * 34573.21\right]}{50.65}$$

Note this is based on the Deloitte research and the further adjustments by the FRG to take account of a smoother transition between practices falling just above or below the threshold for eligibility. List size of 2,232 is the cut-off point where practices benefit from the economies of scale adjustment.

5.45 Of the current 363 practices in N Ireland, 56 practices would have an initial adjustment above 1. The remaining 307 practices are credited with a weight of 1 to reflect that practice expenses per patient stabilise rather than continue to fall as list size increases. It was recommended that any practice with an adjustment greater than 2.5 be flagged and investigated – this would occur for extremely small practices. This does not apply in N Ireland where the minimum practice list is 1,064, giving a maximum economies of scale adjustment of 1.34.

5.46 The isolation criteria, to qualify the extent that a small practice can benefit from the economies of scale adjustment; is applied as shown in Table 5.1.

Table 5.1 Practice Isolation Adjustment

Scenario	**Practice Isolation Adjustment Economies of Scale Weight**
Practice closer than 2.5km to its nearest practice	The "unavoidability" of practice smallness could be avoided & the practice receives no benefit from the economies of scale adjustment.
Practice between 2.5km & 4km from its nearest practice	The benefit of the economies of scale is phased in.
Practice 4km or more from its nearest practice	The practice receives full benefit of the economies of scale adjustment.

5.47 Applying the isolation criteria, only 10 of the 56 practices would benefit from the economies of scale adjustment. All 10 of these practices receive full benefit from the economies of scale adjustment because each of these practices is further than 4km to its next nearest practice.

5.48 Table H.1, Appendix H summarises the Cost of Unavoidable Smallness adjustment index. The table shows that only 10 practices would be expected to gain from the adjustment. Table H.2, Appendix H gives an idea of the scope of benefit for gaining practices. This analysis shows that the CUS adjustment is unlikely to have a substantial effect on many practices, but it could still be worth implementing for the larger effect on a small minority of practices, as shown in Table H.2, Appendix H.

Exclusion of Branch Surgeries in Isolation Adjustment

5.49 Note that branch surgeries are not considered in the distance to nearest practice calculation. This would have complicated the Deloitte methodology as it would have been necessary to account for opening hours of each branch and services provided. We tested the inclusion of branch surgeries in N Ireland in the isolation part of the adjustment (albeit crudely as it did not take account of opening hours or services) and this would have resulted in only 2 practices requiring the adjustment. But in most cases this was due to the next nearest practice actually being the branch of the surgery in question. Practice mergers are not feasible in these cases as the branch is already part of the main practice. In practical terms even if the branch belonged to a different practice, a merger would still not be possible.

5.50 Note that it would not be possible to calculate the initial economies of scale adjustment for branch surgeries as practice lists are assigned to the main practice with no distinction made as to whether a patient belongs to the main surgery or branch surgery.

5.51 The FRG also agreed that if a practice improves rural access by opening a branch surgery, then it would be inappropriate to penalise this which would only stand to create disincentives to making improvements in rural areas.

Perverse Incentives for Practice Splits

5.52 The FRG also felt assured that the adjustment does not create inappropriate incentives for practice to split. Practices have to get very small before the compensation for

smallness becomes substantial and practices also have to be isolated before they could gain from splitting. The NI GMS Working Group is in agreement with this view.

Application of Unavoidable Smallness Adjustment

5.53 The current Carr-Hill rurality adjustment is given a weight of 58% as it only applies to the expenses element of GMS expenditure. Note however that the current NI rurality adjustment is applied in full as the model coefficients refer to total GMS expenditure. The FRG was concerned that applying a 58% weight would detract from the purpose of the Deloitte adjustment which is to compensate the effects of unavoidable smallness and promote the viability of necessarily small practices. Applying a 58% weight would not compensate the lower net income potential that might threaten the sustainability of smaller practices, but would simply compensate for the effects of smallness on expenses per patient. The FRG therefore recommended that the adjustment be applied to the full practice list as both practice expenses and potential net income are relevant. Application of this adjustment in N Ireland should also be applied to the full practice list for the reasons already stated.

The N Ireland GMS Working Group recommends a revised global sum formula that includes a Cost of Unavoidable Smallness adjustment.

5.54 The proposed Cost of Unavoidable Smallness adjustment compensates for the unavoidable costs of practices that are necessarily small because of their isolated location. It could however be argued that a rurality adjustment is still applicable to practices irrespective of size. The NI GMS Working Group has considered the cases for and against the inclusion of a rurality adjustment in the revised formula.

Should the Cost of Unavoidable Smallness (CUS) adjustment replace the existing rurality adjustment or be additional to the present rurality adjustment?

Reasons to Retain the Rurality Adjustment (with or without a CUS Adjustment)

(i) Previous analysis showed that rurality was associated with increased costs per patient after allowing for list size, so it is arguable that a rurality adjustment should be applicable irrespective of practice size.

(ii) Unlike the UK adjustment which received criticism for not being particularly well targeted; the NI adjustment was well received for adjusting for other variables associated with rurality such as distance to other medical services. It was felt that the NI adjustment was a better measure of GP workload than simply rurality per se.

(iii) Although the current N Ireland rurality adjustment does not control for list size and therefore incorporates an economies of scale effect (albeit without taking account of appropriate smallness), there is no reason that the current model cannot be revised controlling for practice list size and then applying the Deloitte adjustment in addition.

(iv) Retaining the current NI rurality adjustment would also continue to acknowledge that there maybe additional costs associated with rurality.

Reasons to Neutralise (i.e. set the index to 1.0 for all practices) the Rurality Adjustment

(i) There is an issue around the validity of analysis based on pre-Contract cost data as it is possible that to some degree the higher costs of rural practices are specific to the previous payment mechanism.

(ii) There is an issue around the validity of patients' distances to practices as a measure of rurality. It is possible that to some degree this measure is again specific to the previous payment mechanism.

(iii) There is an issue around modelling of GMS payments as opposed to GP expenses as it is not possible to ascertain how much was associated with delivering services and how much was retained as profit.

(iv) There may be an issue around agreeing that a rurality adjustment is required in principle. If the consultation concludes that in principle it should be acknowledged that there are additional costs associated with rurality but the validity of the current adjustment is in doubt, then it is recommended that the current adjustment be neutralised pending a more thorough review. Neutralising allows the adjustment to be revised and reinstated at any later stage.

Issues with having a CUS Adjustment as an Addition to a Rurality Adjustment

(i) It may appear over complicated to have 2 adjustments to address similar issues. However, the adjustments could be combined so that in presentational terms they are described in a simpler form.

(ii) The Deloitte "Cost of Unavoidable Smallness" adjustment uses "distance to next nearest GP practice" as the determinant of appropriateness smallness. The current NI rurality adjustment includes "proportion of patients living 3 or more miles from their practice of registration" which will be positively related to "distance to next nearest GP practice". For those practices eligible for both adjustments, it is possible that there may be an element of double counting by having both a rurality adjustment and an adjustment for appropriate smallness but it is by no means likely to be significant.

5.55 The FRG recommended that the revised global sum formula should include a Cost of Unavoidable Smallness adjustment and that this should be applied to the full practice list. The FRG however were unable to recommend whether or not a rurality adjustment should be included in the revised formula due to the lack of evidence and rationale to support its inclusion. The decision on whether to continue with a rurality adjustment has been left with plenary.

5.56 Likewise the NI GMS Working Group is unable to make clear recommendations regarding the rurality adjustment. If the consultation process concludes that the current rurality adjustment has too many issues to retain in its present form, the NI GMS Working Group recommend that the current rurality adjustment is neutralised (i.e. set to 1.0 for all practices) pending a review. A further review of this element should not delay implementation of a revised formula in April 2008. In order for consultees to make more informed responses, distributional impact of the recommended formula has been analysed with and without neutralising of the rurality adjustment.

Distributional Impact of the Current NI Rurality Adjustment versus Cost of Unavoidable Smallness Adjustment

5.57 The original NI rurality adjustment saw 183 (50.4%) practices gaining from the adjustment. The current NI rurality adjustment redistributes 1.64% (equivalent to £1.4m of total global sum expenditure 2006/07). Table I.1, Appendix I summarises the original NI rurality adjustment index.

5.58 Note that the current rurality index is not as redistributive as when originally modelled (see GMS Report, November 2003). This is due to the more accurate method for counting patients who live 3 or more miles from their practice of registration. The

original method relied on claims submitted by GPs, whereas now the CSA calculate straight line distances based on postcodes from patient's postcode of residency to postcode of practice registration.

5.60 If we were to consider including the Deloitte Cost of Unavoidable Smallness adjustment in addition to our own rurality adjustment we need to ensure that any effect of economies of scale is controlled out so a separate adjustment can be made. We have repeated the original rurality modelling but this time we have used list size as the control mechanism. There is actually little change to the NI rurality model; the R^2 increases slightly from 32.4% to 33.3% and there are slight changes to the coefficients on the rural indicators. Table I.1, Appendix I summarises this revised model along side the original model that is currently applied in the global sum formula. In practical terms controlling for economies of scale means only one less practice gains from the adjustment. If we were to reject the idea of the Deloitte Cost of Unavoidable Smallness adjustment we would continue with our original model which incorporates economies of scale.

5.61 Applying the Deloitte Cost of Unavoidable Smallness adjustment on its own would see only 10 practices benefit from the adjustment; this adjustment would redistribute only 0.09% (equivalent to £75k of total global sum expenditure in 2006/07). If we were to move from the current NI rurality adjustment to the Deloitte adjustment alone, this would redistribute 1.65% (or £1.4m of global sum 2006/07 expenditure). The maximum gain experienced by any practices would be +0.033% (£28k of total global sum) and the maximum loss would be -0.038% (£32k of total global sum). However, if we were to adopt the Deloitte CUS adjustment as an addition to our current rurality adjustment (amended for economies of scale), the combined adjustment would redistribute 0.25% (£213k of total GS pot); that is, when comparing rurality plus CUS weighted shares to rurality shares alone. The maximum gain that any practice would experience would be +0.017% (£14k of total global sum) and the maximum loss would be -0.005% (£4k of total global sum). The overall redistribution of the combined indices is 1.52% (or £1.3m of GS pot); compared to a redistribution of 1.64% (£1.4m) under the current adjustment. Table I.3, Appendix I summarises the combined original NI rurality and CUS adjustments. 176 (48.5%) practices benefit from the combination of rurality and smallness.

5.62 Use of the Deloitte CUS adjustment alone would substantially reduce the coverage of the rurality adjustment in the current global sum formula. This is further illustrated in the charts in Appendix I. Figure I.1 shows the distribution of adjustments under the proposed Deloitte adjustment. In addition to restricting the coverage of the rurality adjustment the new CUS adjustment would also break the link between being in a rural area and gaining additional resources. Figure I.2 (and Figure I.3 which excludes economies of scale) shows the distribution under the present funding formula, showing a wide range of variation with the majority of practices receiving adjustments of more than 1% and many receiving adjustments of up to 7% in both directions. Under the current approach, practices in areas of low density always gain whilst only selected practices do so under the Deloitte adjustment.

Equality Impact Testing

5.63 Equality analysis has been carried out at electoral ward level to test whether moving from a rurality only adjustment to one with Cost of Unavoidable Smallness (CUS) included would have an adverse impact on any of the eight equality dimensions for which we have ward level data (data is unavailable for sexual orientation). The data sources for the equality dimensions are detailed in Appendix D. We have tested the

impact of having a rurality plus CUS adjustment and then the impact of a neutralised rurality adjustment plus CUS adjustment. For each option, the percentage share of the weighted registered list in each ward is calculated. We can then compare whether each ward gains or loses in ward share when moving to the proposed formula. The analysis by equality dimension then looks at the percentage of each grouping that live in the wards that gain or lose in share. Given the nature of the formula we would expect some differential impact but not adverse impact across the equality dimensions.

Equality Impact of Rurality plus CUS adjustment

5.64 An equality analysis was carried out for moving from crude population shares to Rurality +CUS weighted shares to show the true impact of such an adjustment. This analysis shows no significant impacts across equality groups that are not justified by the nature of the rural element of the formula. For example, persons without limiting long-term illness (LLTI) gain more than those with LLTI. However this is an acceptable impact as the rural adjustment logically gives higher weight to more rural areas, which tend to have a younger age structure and therefore healthier profile. Also, a large percentage of Irish Travellers live in wards that gain, however this is due to the fact that they tend to be clustered in particular parts of NI, e.g. Newry & Mourne LGD. In addition, a large percentage of the black and minority ethnic group live in wards that lose in share. However, given that this group tend to live in more urban areas, this is also an acceptable differential impact. The maximum loss in ward share is -0.02% and the maximum gain in ward share is +0.02%.

Equality Impact of a Neutral Rurality Adjustment plus CUS adjustment

5.65 The impact of moving from the current rurality adjustment to a CUS adjustment only has also been tested. As expected, with the neutralising of the rurality adjustment many rural wards lose in percentage share in favour of urban wards. There are therefore some differential impacts within equality groups. For example the black and minority ethnic group gain more in ward share than other ethnic groups, however this is a reflection of a higher proportion of this group living in urban areas. Likewise Protestants gain slightly more in ward share than Roman Catholics, however this again is because more urban wards gain and therefore rural areas, which have a larger proportion of Roman Catholics, will lose in share. These and other minor differential impacts are acceptable given that the loss of share in rural wards will then be reflected in the profile of these areas.

Conclusions

5.66 The Formula Review Group (FRG) has recommended that the revised formula in England should include a Cost of Unavoidable Smallness adjustment applied to the full practice list size. The FRG has been unable to recommend whether or not a rurality adjustment should also be included in the revised global sum formula. The NI GMS Working Group have also been unable to arrive at a preferred recommendation and has instead set out the advantages and disadvantages of including or neutralising the rurality adjustment which can therefore be debated during the consultation process.

The N Ireland GMS Working Group is unable to make recommendations regarding the current rurality adjustment. If the rurality adjustment is not considered valid in its current form, it should be neutralised pending a review.

SECTION C: RECOMMENDED FORMULA

6. ELEMENTS OF RECOMMENDED FORMULA

6.1 The NI GMS Working Group recommends that the revised global sum formula should include the following components:

- An updated age/gender adjustment
- Retention of the current additional needs index
- Retention of the current adjustment for list turnover
- Retention of the current adjustment for nursing/residential home patients
- Possibly a Rurality Adjustment
- The addition of a Cost of Unavoidable Smallness Adjustment

The NI GMS Working Group also recommends:

- Neutralising the Staff Market Forces Factor
- That there is no requirement for a GP Market Forces Factor or an adjustment for the Cost of Recruitment & Retention

7. COMBINING FORMULA ADJUSTMENTS

7.1 Each of the adjustments will generate a separate practice index, comparing the practice score on the adjustment to the NI average. The indices are then simultaneously applied to the practice list. This will produce a practice-weighted population. The application of the indices to all practices will produce an overall notional population, which will differ from the actual registered population. Weighted populations are adjusted so as to total the registered population – a process known as normalisation. Each GP practice will then receive their relative share of the overall NI global sum.

7.2 This method of multiplying together the separate adjustments to generate an aggregate formula adjustment is known as the product method. The UK FRG as part of the Review process did consider other options for combining the separate adjustments. The majority of alternatives involve averaging the adjustments rather than multiplying them together. However, the FRG concluded that these options did not reflect the way that differences, across practices, in relative workload and relative unit costs interact to produce differences in total resource requirements. Any variation of the product method only increased the formula complexity while producing similar results and so was deemed unnecessarily complicated. The simple product method has therefore been retained.

8. DISTRIBUTIONAL IMPACT OF OVERALL FORMULA

8.1 The modelling presented in Tables J.1 and J.2, Appendix J shows the projected distributional impact of the recommended formula compared to the current NI global sum formula. A guide to these tables can be found at Appendix E. As the NI GMS Working Group is unable to make a firm recommendation regarding the rurality adjustment, the distributional impact has been presented for 2 options: (Option 1) retaining the rurality adjustment; and (Option 2) neutralising the rurality adjustment. In both options, the age weights have been updated but no changes have been made to the additional needs index, the list turnover adjustment or the adjustment for patients in nursing/residential homes. Both options include the addition of a Cost of Unavoidable Smallness adjustment. In both options the staff MFF has been neutralised.

Distributional Impact of Option 1 versus the Current Global Sum Formula
Option 1: Retention of Rurality Adjustment

- Overall 0.55% of global sum would be redistributed at practice level; this equates to £470k of global sum monies for 2006/07.

- 53% of practices would gain weighted patients and 47% of practices would lose weighted patients.

- The change in weighted patients would range from -7.4% to +27.4%. Excluding the 1% most extreme practices (0.5% at each extreme), the range would be -4.0% to +14.8%. Excluding the 5% most extreme practices (2.5% at each extreme), the range would be -2.8% to +3.0%.

- 50% of NI practices are expected to have a change in weighted patients between -0.8% and +0.97%. 70% of practices are expected to have a change between -1.26% and +1.52%. 80% of NI practices are expected to have a change in weighted patients between -1.6% and +2.0%. 90% of practices are expected to have a change between -2.25% and +2.59%.

- There would be only small redistributive effects across practice cohorts, as summarised in Table 8.1

Table 8.1 Redistribution across practice cohorts – Option 1

Cohort Category	Average % Change in Weighted Patients	
	Lowest Quartile of Practices	Highest Quartile of Practices
List Size	2.88%	0.17%
Number of GPs	1.65%	-0.10%
SLLI	1.16%	-1.12%
Distance to Urban Centre	-0.29%	0.81%
Distance to GP Surgery	-0.30%	0.62%
% of Patients aged >65	-1.61%	1.74%
New Registrations	0.52%	-0.39%
Nursing/Res Home Patients	-0.66%	0.84%
Index of Multiple Deprivation	1.00%	-0.96%

8.2 Compared to the current global sum formula, the recommended formula (retaining rurality) would tend to increase the weighted capitation share of smaller practices, rural practices and practices with higher proportions of elderly patients. Intuitively these distributional results are as expected given that the recommended revised age/gender curve is now steeper and therefore places more weight on elderly patients. Likewise the introduction of the Cost of Unavoidable Smallness adjustment benefits small practices which are isolated and so we would expect the smaller and rural practices to see an increase in weighted share.

Distributional Impact of Option 2 versus the Current Global Sum Formula
Option 2: Neutralising of Rurality Adjustment

- Overall 1.59% of global sum would be redistributed at practice level; this equates to £1.4m of global sum monies for 2006/07.

- 52% of practices would gain weighted patients and 48% of practices would lose weighted patients.

- The change in weighted patients would range from -11.3% to +25.6%. Excluding the 1% most extreme practices (0.5% at each extreme), the range would be -9.6% to +13.8%. Excluding the 5% most extreme practices (2.5% at each extreme), the range would be -7.5% to +7.1%.

- 50% of NI practices are expected to have a change in weighted patients between -3.0% and +3.0%. 70% of practices are expected to have a change between -4.7% and +4.2%. 80% of NI practices are expected to have a change in weighted patients between -5.7% and +4.9%. 90% of practices are expected to have a change between -7.0% and +5.7%.

- There would be only small redistributive effects across practice cohorts, as summarised in Table 8.2.

Table 8.2 Redistribution across practice cohorts – Option 2

Cohort Category	Average % Change in Weighted Patients	
	Lowest Quartile of Practices	Highest Quartile of Practices
List Size	2.58%	1.35%
Number of GPs	1.08%	1.17%
SLLI	1.07%	0.27%
Distance to Urban Centre	3.66%	-2.76%
Distance to GP Surgery	2.61%	-3.33%
% of Patients aged >65	-1.93%	2.62%
New Registrations	1.38%	-0.82%
Nursing/Res Home Patients	-1.66%	0.92%
Index of Multiple Deprivation	1.95%	0.53%

8.3 Compared to the current global sum formula, the recommended formula (neutralising rurality) would tend to increase the weighted share of practices with higher proportions of elderly patients. Intuitively this distributional result is as expected given that the recommended revised age/gender curve is now steeper and therefore places more weight on elderly patients. Although the recommended option 2 tends to increase the weighted capitation share of smaller practices (due to the addition of the Cost of Unavoidable Smallness adjustment), it decreases the weighted capitation of rural practices while redistributing resources back to urban practices due to having neutralised any effect of rurality.

Comparison of the 2 Recommended Formulae

8.4 The modelling presented in Table J.3, Appendix J shows the projected distributional impact of the recommended formula with the rurality adjustment compared to the recommended formula having neutralised the rurality adjustment. There would be very small effects across practice cohorts as summarised in Table 8.3.

- Overall 1.52% of global sum would be redistributed at practice level; this equates to £1.3m of global sum monies for 2006/07.

- 47% of practices would gain weighted patients and 52% of practices would lose weighted patients.

- The change in weighted patients would range from -10.1% to +6.6%. Excluding the

1% most extreme practices (0.5% at each extreme), the range would be -9.7% to +5.6%. Excluding the 5% most extreme practices (2.5% at each extreme), the range would be -6.6% to +5.0%.

- 50% of NI practices are expected to have a change in weighted patients between -3.0% and +2.9%. 70% of practices are expected to have a change between -4.7% and +3.8%. 80% of NI practices are expected to have a change in weighted patients between -5.4% and +4.3%. 90% of practices are expected to have a change between -6.3% and +4.8%.

Table 8.3 Redistribution across practice cohorts – Option 1 versus Option 2

Cohort Category	Average % Change in Weighted Patients	
	Lowest Quartile of Practices	Highest Quartile of Practices
List Size	-0.30%	1.18%
Number of GPs	-0.57%	1.26%
SLLI	-0.09%	1.40%
Distance to Urban Centre	3.95%	-3.57%
Distance to GP Surgery	2.92%	-3.95%
% of Patients aged >65	-0.32%	0.88%
New Registrations	0.87%	-0.43%
Nursing/Res Home Patients	-1.00%	0.08%
Index of Multiple Deprivation	0.94%	1.49%

8.5 Compared to the recommended formula with a rurality adjustment, neutralising the rurality adjustment would on average tend to decrease the weighted capitation share of rural practices. A formula which neutralises rurality would also tend to increase the weighted capitation share of practices with high additional needs, practices with higher proportions of elderly patients and relatively larger practices. These results are intuitive in that resources are being redirected back from rural to urban areas and we know that urban areas have higher additional needs and that a higher proportion of the elderly population live in urban areas (60% of the elderly population live in urban areas).

SECTION D: IMPLEMENTATION ISSUES

9. GENERAL PRACTICE WORKLOAD SURVEY

9.1 The FRG identified that a new workload survey could usefully inform future work on the global sum formula. The last large scale workload survey of general practice was carried out in 1992/93. The FRG commissioned the Technical Steering Committee (TSC) to undertake this survey. The survey has collected information on: the distribution of work in general practice, skill mix changes, particularly the contribution made by practice staff and practice workload. The survey will produce results at UK level. The results of the survey were reported in July 2007. The formula should again be reviewed in light of this additional data. Any decision to adopt a revised formula would be a matter for negotiation.

10. MPIG NEGOTIATIONS/OPTIONS

10.1 The Minimum Practice Income Guarantee (MPIG) was established in April 2004, after financial modelling confirmed that the introduction of the global sum payments would lead to a reduction in the basic income of a majority of practices. Under the MPIG agreement, any practice that would lose as a result of the global sum introduction

received a guarantee that its allocation would reflect its previous level of income. Under this agreement a "correction factor" would be paid to a practice to make up the difference between its global sum (as determined by the formula) and its global sum equivalent income.

10.2 Discussion during the review concluded that the need for MPIG had arisen due to the total global sum financial envelope being smaller than the historic funding levels against which comparison was being made. The FRG confirmed that the size of the funding envelope was the main reason for this imbalance as opposed to a failing of the new global sum formula.

10.3 Every quarter, practices' global sums are recalculated, allowing for changes in list size and patient characteristics, which may increase or decrease accordingly. On top of this, MPIG practices continue to receive the correction factor at the level set from the original calculation at the beginning of 2004/05.

10.4 As part of the agreed 2006/07 contract revisions, it was agreed that future uplifts to the global sum should seek to reduce the reliance upon correction factor payments.

10.5 The FRG agreed that the historic institution of MPIG and correction factor payments prevented the equitable distribution of the resource envelope between practices based on the agreed formula. However, the financial stability of individual practices was recognised as vital. Any revisions to the current formula would again raise the issue of practice financial stability and therefore the FRG gave some thought to managing this next transition. The FRG considered 2 options: retaining the previous MPIG levels from 2004/05 or establishing new MPIGs based on practice income immediately prior to the implementation of a new formula.

10.6 As yet the FRG has not made a recommendation regarding a preferred option to deal with financial stability while moving towards a more equitable distribution of resources. The FRG's remit was to examine the technical aspects of the formula as objectively as possible without any distraction regarding MPIG. This will be a matter for plenary to discuss and further negotiation will be necessary between GPC, the NHS Employers and the Departments of Health. Any recommendations regarding MPIG in N Ireland will follow the national policy adopted in GB.

11. IMPLEMENTATION TESTING BY THE CENTRAL SERVICES AGENCY

11.1 The quarterly global sums for each practice are calculated by Information & Research Unit, Family Practitioner Services Directorate at the Central Services Agency. Currently the calculation is performed outside of the Exeter System and therefore any revisions to the global sum formula will not impact on the IT core system.

11.2 The recommended formula would entail the CSA amending their calculation spreadsheets to reflect the updated age/gender weights, the setting of the MFF to 1.0 and to reflect the revisions to the rurality index. The spreadsheets would also need to be revised to include the Cost of Unavoidable Smallness adjustment. This involves modelling to establish every practice's next nearest practice, however, this modelling will not be required each quarter, but only when there are new practices configurations such as mergers, splits or new practices. However, the CSA will want to ensure that they have a procedure which is as automated as possible for carrying out the quarterly global sum calculation and so implementation testing needs to be built into the timetable.

APPENDIX A: NI Current Global Sum Formula in Operation since April 2004

Introduction

A.1 This appendix presents the core findings from the analysis used to derive the current Northern Ireland resource allocation formula for the new GMS Contract. This formula is currently used to allocate the global sum on the basis of the practice population, weighted for factors that influence relative needs and costs. The formula aims to ensure that resources reflect more accurately the contractor's workload and unavoidable costs of delivering high quality care to the local population. The formula includes the following components:

- An adjustment for the age/gender structure of the population;
- An adjustment for patients in nursing and residential homes;
- An adjustment for the additional needs of the population relating to morbidity and mortality;
- An adjustment for list turnover;
- Adjustments for the unavoidable costs of delivering services to the population including a rurality index and a Market Forces Factor.

A.2 The approach to the formula followed that established elsewhere in the field of resource allocation; that is, expressing relative need in cost terms. This involved establishing an age/gender curve, estimating the additional resource implications of additional needs and adjusting for other factors that affect the cost of delivering services. A number of different exercises were carried out to establish and estimate these adjustments. The approaches, main results and final adjustments are summarised below.

Age/Gender Workload Curve

A.3 The basis of any resource allocation formula is the population served. For GMS in the UK this is defined as those registered on the lists of each general practitioner. Although there are well known problems with list discrepancy, these lists are well defined and maintained by the Central Services Agency. However, there is no dataset that provides an estimate of the workload generated by different age/gender groups. Consequently this workload has to be estimated from a number of different data sources.

A.4 Consultations can take place in the surgery, the patient's own home or in a nursing or residential home. There is no single data source adequately covering general practice consultations in all of these environments. Survey data was available on surgery consultations, limited survey data was available on home visits; length of both had to be estimated from UK studies. No routine data was available on nursing and residential home consultations.

Surgery Consultations

A.5 Analyses of surgery consultations were based on the Continuous Household Survey, an annual NI-wide survey of approximately 2,800 households (5,500 individuals). Fieldwork is spread across the year to eliminate seasonal fluctuations. 3 years of data were used to produce a 3-year average (1999/00 to 2001/02 was the most recent data available at the time of analysis).

A.6 Only frequency of consultations is recorded by the CHS so a separate data source was used to calculate average length of consultations by age/gender group. The length

adjustment was derived from a Scottish research study which was considered the best data source available at the time of modelling. The age/gender workload adjustment for surgery consultations is presented in Table A.1 below.

Table A.1 NI Age/Gender Workload Adjustment: Surgery Consultations Only

Age Group	Males		Females	
	Average time per person	Ratio to Male 5-15	Average time per person	Ratio to male 5-15
0-4	27.9	2.26	27.5	2.23
5-15	12.3	1.00	13.6	1.10
16-44	16.6	1.35	44.1	3.58
45-64	37.7	3.05	55.8	4.52
65-74	55.1	4.46	53.2	4.31
75-84	50.3	4.07	60.1	4.87
85+	56.0	4.54	45.6	3.70

A.7 In general the weights are intuitive; males aged 0-4 generating slightly more workload than females, higher workload for children aged 0-4 than 5-15 and females generating more workload throughout adulthood. The counter intuitive reduction in average time and hence relative workload for the most elderly female patients could be explained by home visits; the rate for home visiting from the CHS 1990/00 to 2001/02 was 0.25 and 0.12 visits per annum for females and males respectively.

Home Visits

A.8 Although the CHS does record home visits, a breakdown by age and gender was not possible due to small numbers and therefore confidentiality rules. Age/gender relativities were estimated from another UK study and applied to the total number of home visits recorded from the CHS 3-year average. A clear "J" shaped relationship between age and home visiting rates is apparent for both males and females.

A.9 On the whole, a home visit tends to generate a higher workload than a surgery consultation, as the consultation itself is often longer and also has an associated travel time. According to the 1992/93 GP Workload Survey, the average length of a home visit, including travel time, is 25.2 minutes. Applying the home visit length to the rates of home visiting produces the home visit rates per 1,000 patient years as shown in Table A.2 below. With the exception of children aged 0-4, home visit rates are always higher for females.

Table A.2 NI Home Visit Rates adjusted for length, per 1,000 patient years

	0-4	5-15	16-44	45-64	65-74	75-84	85+
Males	357	85	48	125	468	1231	2792
Females	330	88	143	195	563	1558	3133

A.10 Combining the length-adjusted home visits with the length-adjusted consultation in surgery produces an age-gender workload index as set out in Table A.3. Therefore, each male patient on a contractor's list aged over 85 will attract 7.67 times the resources for a male patient aged 5-15. Note that combining the surgery and home visits has removed the counter-intuitive reduction in workload for the elderly, confirming that this was due to the higher proportion of home visits in this age group.

Table A.3 Age/Gender Workload Index (males aged 5-15 = 1)

	0-4	5-15	16-44	45-64	65-74	75-84	85+
Males	2.47	1.00	1.26	2.88	4.58	5.22	7.67
Females	2.41	1.09	3.36	4.27	4.56	6.35	7.36

A.11 Note that males 0-4 generate slightly more workload than females of the same age. As expected, females generate more workload during childbearing years whereas little difference is observed between the genders in the 65-74 age group. Females aged 75-84 generate more workload due to a higher proportion of home visits which are longer in length.

Nursing & Residential Homes

A.12 Two separate UK surveys were carried out to analyse the relative workload generated by patients in nursing and residential homes. One was directed to nursing and residential homes to generate information on the frequency of consultations; and the other to GPs, exploring time spent on nursing and residential consultations. Overall, patients in nursing and residential homes generate more workload than patients with otherwise similar characteristics who are not in nursing and residential homes. This is mainly due to the fact that all home consultations involve travelling time.

A.13 N Ireland was adequately represented in these UK surveys and as data would not have been sufficiently robust to derive a NI-specific adjustment, it was deemed appropriate to apply the UK factor. A factor of 1.43 is therefore applied in respect of each patient in a nursing or residential home.

List Turnover

A.14 Areas with high list turnover often have higher workload, as patients in their first year of registration in a practice tend to have more consultations than other patients with otherwise similar characteristics. Analysis of the workload implications using the General Practice Research Database (GPRD) indicated 40-50% more workload, as measured by aggregate consultation times, within the first year of registration. An average uplift factor of 1.46 is therefore applied in respect of all new registrations.

Additional Needs

A.15 As well as the impact on contractors' workload generated by differing age and gender groups, the effect of indicators of mortality and morbidity on consultation frequency has been estimated, using the N Ireland Health and Social Wellbeing Survey 1997. This is a representative random survey of 4,233 individuals.

A.16 The survey asks participants whether they have had a GP consultation in the past 2 weeks, and if yes the number of consultations. The survey also includes information on age, gender, geographic location and a range of morbidity and socio-economic indicators. These were combined with a range of other small area level variables including census variables, mortality indicators, components of and the overall score of the Index of Multiple Deprivation and supply variables.

A.17 Of the variables tested, Standardised Limited Long-Standing Illness (SLLI), Standardised Self-Assessed Health "Not Good" (SSAH), unemployment rate (UNEMP) and single carer households (SCHH) were found to be significant and the best

variables for explaining variations in workload over and above age and gender. They are related to workload by the following formula:

Practice List * (19.582 + (0.195 * SLLI) + (0.271 * SSAH) + (0.049 * UNEMP) – (0.024 * SSCH)

Unavoidable Costs

A.18 As well as the impact on workload of practice characteristics, it is also necessary to analyse the impact on costs. Practices are likely to face differing costs of delivering a service depending on location and structure. Within the global sum, there were believed to be 3 main causes of this: market forces, rurality and practice size.

Staff Market Forces

A.19 The aim of the Staff Market Forces Factor (MFF) is to reflect the geographical variation in staff costs that practices will incur. The GB market forces factor was developed by Warwick University and based on the latest 3 years of the New Earnings Survey Panel dataset. The equivalent earnings dataset for N Ireland was not amenable to similar analysis. The MFF for N Ireland outside Belfast was therefore taken to be the average between Scotland and Wales, that is, outside of Edinburgh and Cardiff respectively. The MFF for Belfast was taken to be the average between Edinburgh and Cardiff.

A.20 As a NI data source was not available to derive a staff MFF and there was no evidence to disprove the weightings set out by the UK negotiators, these market forces factors were applied in NI pending further evidence. This element of the formula has been given a weighting of 48%, as this is the average proportion of the global sum accounted for by staff expenses.

Rurality & Economies of Scale

A.21 The cost of delivering services is likely to be affected by the rurality of the area the practice serves. The impact of rurality on costs has been modelled using pre-Contract GMS payment data. The dataset contained information on all practices in N Ireland with the exception of a small number of practices whose expenditure could not be tracked for a full financial year due to mergers/splits. The assembled dataset contained a range of indicators of population density, dispersion, mileage to GP of registration and proximity to other medical facilities. The modelling controlled for other factors such as the age and deprivation structure of the population, Board policies, list discrepancy and market forces. Of the variables tested, distance to an urban centre of 20,000+ people (DIST20), distance to an urban centre of 50,000+ people (DIST 50), average distance to the nearest A&E or Minor Injuries Unit (A&E/MIU) and the percentage of patients living 3 or miles from their practice of registration (MILEAGE) were found to be significant and the best variables for explaining variations in costs due to rurality. Variations in the unavoidable costs associated with rurality are explained by the following formula:

$$\text{Practice List} * (\text{Dist20})^{-0.028} * (\text{Dist50})^{0.042} * (\text{A\&E/MIU})^{0.003} * (\text{MILEAGE})^{-0.073}$$

A.22 Small practices can be expected to incur disproportionately high expenses due to their inability to secure economies of scale. Many costs, especially those associated with premises, are not easily disaggregated and must be incurred irrespective of practice size. The case for including economies of scale in the formula was rejected in GB in order to avoid any perverse incentive for practices to disaggregate or to avoid amalgamation. The NI GMS Working Group was in agreement regarding the potential

for this perverse incentive but attempted to account for economies of scale by incorporating this into the rurality index. No list size control was applied in the modelling, allowing significant variables to pick up increased costs due to both rurality and practice size.

Equality Impact Assessment

A.23 Note that each element of the formula has been subject to equality testing. Section 75 of the Northern Ireland Act 1998 requires public authorities in carrying out their functions to have due regard to the need to promote equality of opportunity between: men and women generally; persons of different religious beliefs, political opinion, racial group, marital status, age or sexual orientation; persons with a disability and persons without; and persons with dependants and persons without.

A.24 The remit of the NI GMS Working Group was to: test each element of the UK global sum formula against NI equality legislation and recommend evidence based refinements where deemed necessary to avoid or minimise adverse impacts across any of the 9 equality dimensions. For those elements that could be tested, the equality assessment demonstrated justifiable impacts, in that, when using a NI-specific adjustment, resources were skewed in a manner which better promoted equality and equity. For this reason NI-specific adjustments were recommended for age/gender, additional needs and rurality.

Combining the Adjustments

A.25 At each stage of the calculation, the weighted practice populations are normalised (scaled back) to the NI normalised weighted population. This is done as follows:

$$\text{Normalised weighted population} = \text{weighted population} * \frac{\text{NI normalised weighted population}}{\text{Sum of practice weighted populations}}$$

Normalisation is carried out so that each of the adjustments carries an appropriate weight. The normalised weighted population for each adjustment is then divided by the raw practice list to generate a practice index for each adjustment.

A.26 Each adjustment will generate a separate practice index, comparing the practice score on the adjustment to the NI average. The 6 indices are then applied simultaneously to the practice raw list. This produces a practice-weighted population. This practice-weighted population is then normalised to the NI normalised weighted population.

APPENDIX B: GMS Information System (GMSIS)

B.1 The DHSSPS require sufficient means for capturing and analysing data on GP-interaction to support the monitoring, planning and delivery of General Medical Services in N Ireland. The Department of Health, Social Services and Public Safety (DHSSPS) has identified the opportunities that are opening in terms of the wide remit of primary care information that is available with the advent of the implementation of the new contract.

B.2 In order to tap into this rich data source a new information system, GMSIS, is being developed. Staff have been seconded from the Northern Ireland Statistics and Research Agency (NISRA) and are based at the Central Services Agency's (CSA) Information and Research Unit; working in partnership with the DHSSPS.

B.3 The aim of the General Medical Services Information System (GMSIS) is to develop and maintain a high quality database of anonymised patient level data extracted from General Practice clinical systems**.** The project aims to collect data on: practice demographics, morbidity, prescribing rates, consultation rates, rates of referrals, immunisations and lifestyle factors.

B.4 Some of the aims of creating a GMSIS include: to promote better patient care in general practice through improved use of information systems; to help with the planning of health service provision; to provide GPs with feedback on morbidity within their own practice, compared with other participating practices; to provide more reliable statistics on morbidity and to monitor trends in disease prevalence and incidence; and to help GP practices in assessing the health needs of their practice population

B.5 A Project Board is currently being established who will be accountable for the success of the project. The Project Board will consist of representatives from: the DHSSPS, the Central Services Agency, the new Health & Social Care Authority, Local Commissioning Groups, GPs, Directorate of Information Systems, Centre for Procurement Excellence and the Health & Social Care Councils. The Project Board will be supported by a Project Manager.

B.6 Current timescales are aiming towards recruitment of the Project Manager by autumn 2007 with the project being completed by April 2008, that is, from April 2008 data would be being extracted, quality assured, analysed and disseminated.

APPENDIX C: Evidence Base for NI Workload Factors Recommendations

C.1 The FRG Report on the Review of the GMS Global Sum Formula published in December 2006, quoted age/gender weightings which had not yet been adjusted for length and did not include a home visit adjustment. The Report recommended that any revised formula should include these adjustments and sets out how these will be calculated. For comparability, it was easier to exclude these adjustments from the NI data than carry out the calculation to arrive at final weights based on the QResearch data plus GPRD and the 1992/93 Workload Survey.

C.2 Figures C.1 and C.2 compare surgery consultations only, separately for males and females. We can see that the NI weights are much steeper for all age groups except children where the weights are similar. Both the English/Welsh and NI curves show a counter intuitive reduction in workload for the elderly; this is most likely due to a higher proportion of home visits in these age groups. This in fact is confirmed later when home visits are taken into account in the age/gender curve.

Figure C.1 Surgery Consultations Only - Males

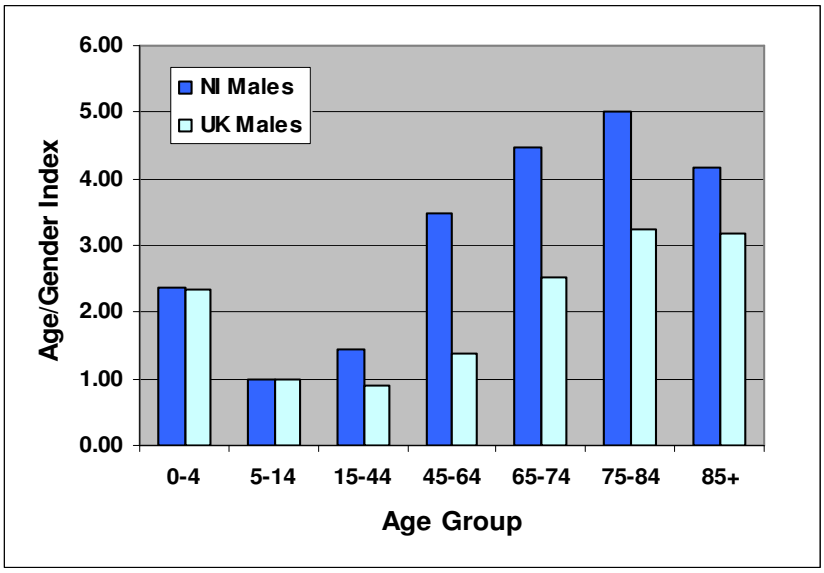
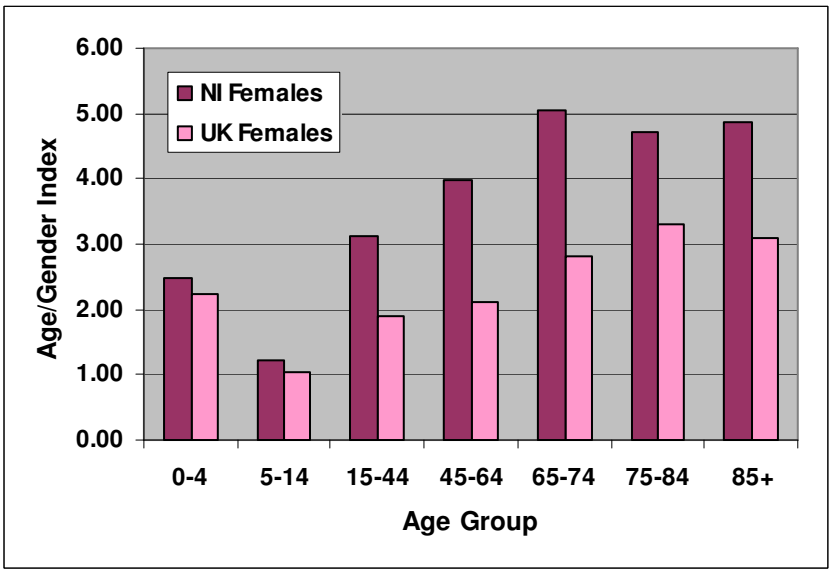


Figure C.2 Surgery Consultations Only - Females



C.3 In England, patients have other means of accessing primary care services such as walk-in centres and this may explain the less steep curve, especially in the adult age groups which are more likely to use these other facilities – the differential between England and NI being more pronounced in the adult age groups. The charts confirm that it would not be appropriate to generalise the English/Welsh workload pattern onto N Ireland.

C.4 It is recommended that if we continue to use the NI-specific separate adjustments, the age cost curve should be updated to use the most recent GP consultation data available. The original age/gender curve was based on a 3-year average of consultations from the CHS from 1999/00 to 2001/02. This can be updated to a 3-year average of 2003/04 to 2005/06.

Figure C.3 Trends in Surgery Consultations in N Ireland - Males

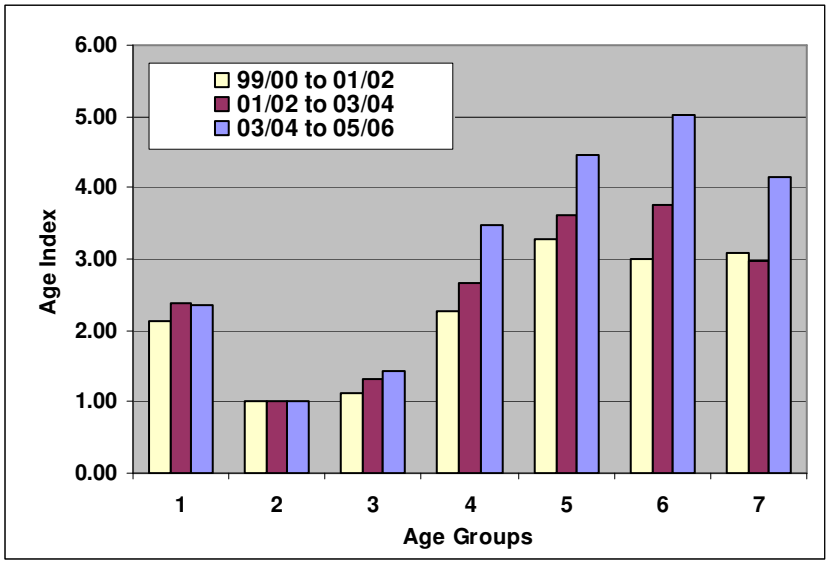
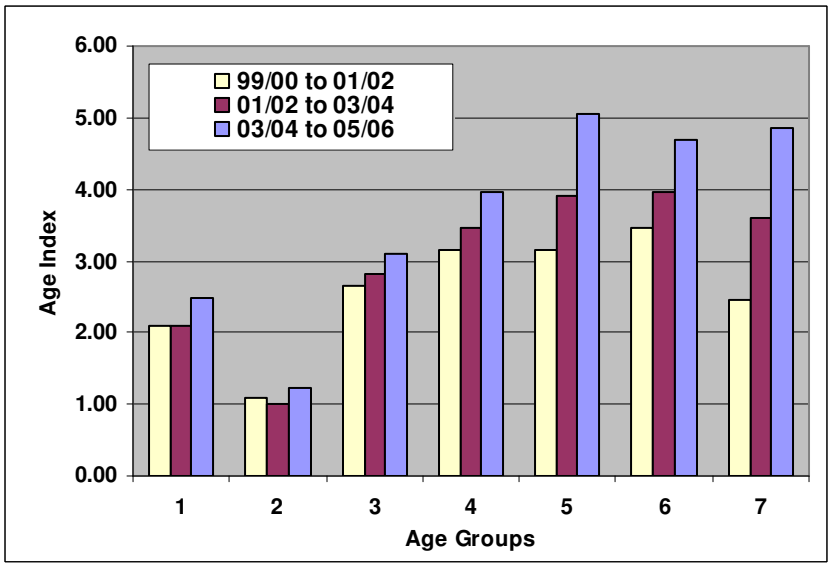


Figure C.4 Trends in Surgery Consultations in N Ireland - Females



C.5 Figures C.3 and C.4 show the steep rise in consultations since 1999/00-2001/02, the trend being more pronounced for females than males. The steeper increase in the average 2003/04-2005/06 is probably due to the inclusion of practice nurse consultations, which were only recorded by the CHS since 2003/04. These trends

confirm that it would not be appropriate to continue with the current age curve as this no longer reflects GMS workload in N Ireland.

C.6 If we update the NI age/gender curve with consultations from 2003/04 to 2005/06 and incorporate home visits and adjust both surgery consultations and home visits for length we can see that the updated weights are much steeper for all ages; particularly in the elderly age groups. Again this confirms the need to update the age/gender index to reflect current workload patterns.

Figure C.5 NI Age/Gender Index based on Consultations 2003/04-2005/06

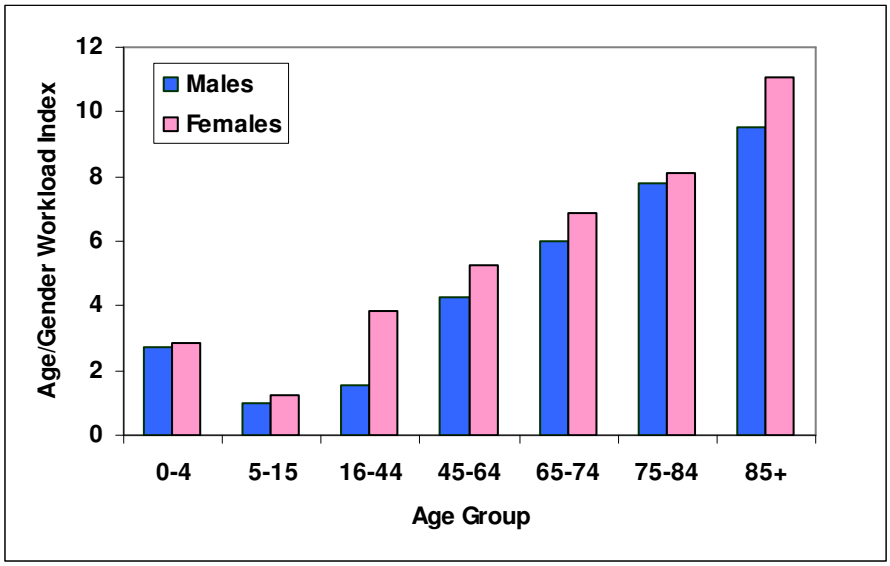
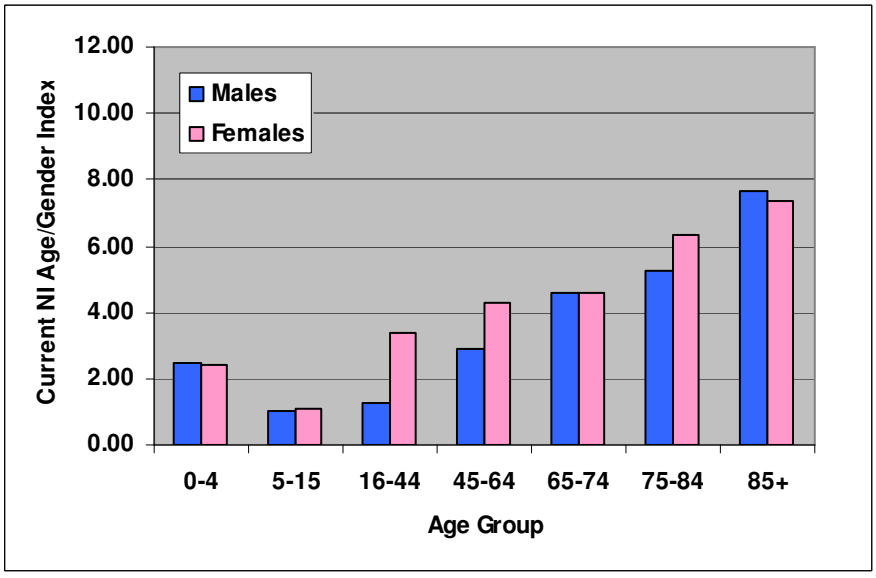


Figure C.6 NI Age/Gender Index based on Consultations 1999/00-2001/02



APPENDIX D: Data Sources for Equality Dimensions

Equality Dimension	Data Source	Level of Analysis
Men and Women	NI Census 2001 Small Area Statistics	Electoral ward
Persons of Different Ages	NI Census 2001 Small Area Statistics	Electoral ward
Persons of Different Marital Status	NI Census 2001 Small Area Statistics	Electoral ward
Persons with Different Religious Beliefs	NI Census 2001 Small Area Statistics	Electoral ward
Persons with/without a Disability	NI Census 2001 Small Area Statistics In receipt of benefits at February 2002 Department of Social Development	Electoral ward Electoral Ward
Persons from Different Racial Backgrounds	NI Census 2001 Small Area Statistics	Electoral ward
Persons with/without Dependant Children	NI Census 2001 Small Area Statistics	Electoral ward
Persons of Different Political Beliefs	First Preference Votes Cast in the June 2001 Local Council Elections for Seats Won	Local Government District
Persons of Different Sexual Orientation	No data available	No analysis undertaken

APPENDIX E: Distributional Impact Tables – Workload Factor

Guide to the Projected Distributional Impact Tables

E.1 Throughout the formula review process in England, the FRG considered the impact of any decisions through detailed modelling on the distribution of weighted patients across practices. Likewise in reviewing the formula in N Ireland, we want to ensure that when decisions are taken regarding implementation, the full impact of any resource redistribution and practice stability are known.

E.2 This modelling work is based on 1st October 2006 data for all practices in N Ireland. For every practice the weighted list sizes that would result from applying the UK's recommendations are calculated. This is compared to the results of applying the current NI global sum elements (updated where possible) on the same date. This provides results for all 363 practices in NI. The distributional impact table provides results for various practice groups, allowing specific consideration of the impact of particular groups of practices that we felt were of particular interest. We considered the impact of the FRG recommendations upon all practices and groupings as determined by:

- list size
- number of GPs
- Standardised Limiting Long-Standing Illness (SLLI) Scores
- Rurality - Distance to an Urban Centre of 50,000+ population
- Rurality - Distance to GP Surgery of Registration
- Proportion of patients aged over 65
- Proportion of new registrations
- Proportion of patients living in nursing & residential homes
- The Index of Multiple Deprivation

E.3 The first two columns provide the overall formula weights for each practice cohort, for both the current and the proposed option for the workload elements. This is the average ratio of weighted list size to un-weighted list size and is a measure of the average strength and direction of the adjustment on the practice cohort. Although the average weighted list size is equal to the average un-weighted list size, the average ratio for all practices does not equal 1, that is, this is the average of the individual indices for each practice.

E.4 The next column "average % change" refers to the average percentage change in the workload element weight in moving from the current adjustments to the recommendation. This is equivalent to the average percentage gain in weighted patients that would be expected for practices in the cohort of interest from making the formula change.

E.5 The remaining columns show the distribution of percentage changes across practices. For each practice the % change is calculated from moving from the current option to the proposed recommended option. The changes are ranked across all practices and reported in terms of largest negative change (minimum), largest positive change (maximum), and other percentiles in the distribution.

Table E.1 Projected Distributional Impact of UK Proposed Workload Factor

Base: Combined Age/Need/New Registration/Nursing & Residential Homes Indices of NI Current Formula
Option: QResearch Model 20 Workload Factor Model
Source data: 2006/07 Quarter 3 payments data from NHAIS "Exeter" System

	Average Index Baseline	Average Index Option	Average % Change	Min	0.50%	5%	10%	25%	Percentiles 50%	75%	90%	95%	99.50%
All Practices	**1.007**	**1.006**	**-0.13%**	**-30.54%**	**-30.18%**	**-22.68%**	**-19.50%**	**-8.53%**	**1.08%**	**8.92%**	**18.52%**	**32.75%**	**64.05%**
Practice List Size													
2,000 and under	1.0481	1.0327	-1.53%	-30.10%	-29.49%	-26.51%	-19.45%	-11.28%	0.16%	7.57%	17.98%	30.38%	51.99%
2,001 to 5,000	1.0070	1.0145	0.76%	-30.54%	-27.84%	-22.96%	-21.07%	-8.39%	1.60%	9.48%	20.17%	45.86%	65.26%
5,001 to 10,000	0.9929	0.9851	-0.78%	-30.50%	-27.97%	-20.72%	-16.58%	-7.48%	0.92%	7.33%	21.31%	26.46%	36.85%
Over 10,000	1.0084	1.0057	-0.27%	-26.96%	-26.38%	-21.18%	-19.90%	-8.41%	4.36%	13.27%	16.75%	17.12%	19.16%
Number of GPs in Practice													
1	1.0313	1.0219	-0.95%	-30.10%	-29.22%	-26.27%	-19.45%	-11.65%	0.05%	9.10%	23.73%	30.21%	61.71%
2 or 3	1.0044	1.0058	0.14%	-30.54%	-30.51%	-22.88%	-19.27%	-7.30%	1.16%	8.84%	15.92%	35.78%	65.19%
4 or 5	0.9985	0.9973	-0.12%	-26.61%	-26.23%	-21.31%	-19.31%	-7.76%	1.20%	8.08%	24.64%	30.93%	37.82%
6 or above	0.9953	0.9951	-0.01%	-26.96%	-26.08%	-21.36%	-20.44%	-8.50%	1.99%	13.97%	17.50%	19.96%	25.92%
SLLI													
Lowest SLLI Quartile	0.8835	1.0062	12.27%	-1.64%	-1.16%	1.96%	3.72%	6.20%	10.82%	16.86%	31.56%	36.75%	60.00%
Quartile 2	0.9476	1.0272	7.96%	-5.08%	-4.78%	-3.55%	-2.44%	1.06%	3.36%	8.84%	25.59%	52.87%	64.43%
Quartile 3	1.0154	0.9926	-2.28%	-15.95%	-15.36%	-12.56%	-10.36%	-6.47%	-3.45%	0.10%	6.23%	14.52%	34.52%
Highest SLLI Quartile	1.1893	0.9945	-19.48%	-30.54%	-30.52%	-27.09%	-24.66%	-22.07%	-18.16%	-11.19%	-6.36%	-2.08%	31.88%
Rurality - Distance to Urban Centre													
Lowest urban centre Quartile	1.1393	1.0206	-11.87%	-30.54%	-30.52%	-27.09%	-24.66%	-21.64%	-12.33%	1.93%	12.02%	23.06%	35.40%
Quartile 2	0.9868	1.0246	3.79%	-19.44%	-19.18%	-16.40%	-13.24%	-4.12%	2.22%	10.96%	25.49%	34.54%	60.06%
Quartile 3	0.9401	0.9899	4.98%	-22.55%	-22.52%	-15.00%	-9.63%	-2.28%	3.95%	10.86%	23.09%	37.20%	61.22%
Highest urban centre Quartile	0.9585	0.9842	2.57%	-23.03%	-21.45%	-15.12%	-13.86%	-5.49%	1.18%	8.88%	16.38%	28.31%	61.41%
Rurality - Distance to GP Practice													
Lowest GP mileage Quartile	1.0517	1.0174	-3.43%	-30.54%	-28.99%	-24.72%	-22.50%	-15.09%	1.05%	5.88%	18.83%	29.07%	48.09%
Quartile 2	1.0470	1.0105	-3.66%	-30.50%	-30.33%	-22.95%	-20.74%	-9.37%	-2.05%	4.36%	12.09%	20.64%	52.90%
Quartile 3	0.9862	0.9985	1.22%	-26.96%	-25.24%	-19.35%	-16.02%	-6.15%	1.00%	10.95%	17.31%	30.19%	51.72%
Highest GP mileage Quartile	0.9382	0.9949	5.66%	-23.41%	-23.24%	-13.96%	-11.03%	-2.49%	3.07%	11.26%	27.89%	45.86%	66.04%
Patients aged > 65													
Lowest (pat > 65) Quartile	1.0470	0.9757	-7.13%	-30.54%	-30.52%	-26.97%	-22.38%	-16.80%	-6.66%	4.13%	14.49%	26.26%	46.55%
Quartile 2	0.9971	0.9716	-2.55%	-27.18%	-26.91%	-22.89%	-20.36%	-9.01%	-0.93%	5.28%	11.78%	17.39%	53.24%
Quartile 3	0.9585	1.0141	5.56%	-23.07%	-22.47%	-12.22%	-7.26%	-2.52%	4.51%	10.57%	28.35%	33.85%	64.47%
Highest (pat > 65) Quartile	1.0225	1.0664	4.39%	-25.74%	-25.22%	-20.74%	-13.51%	-3.34%	3.95%	12.82%	25.97%	36.65%	62.83%
New Registrations													
Lowest New Reg Quartile	1.0777	0.9709	-10.68%	-30.54%	-29.25%	-26.61%	-23.75%	-19.62%	-8.58%	1.63%	8.18%	9.84%	14.38%
Quartile 2	0.9927	1.0139	2.12%	-26.97%	-24.62%	-20.68%	-16.43%	-6.72%	1.33%	9.58%	27.77%	41.38%	65.39%
Quartile 3	0.9789	1.0176	3.87%	-30.50%	-27.43%	-16.83%	-13.17%	-4.00%	2.19%	13.21%	26.01%	34.08%	61.84%
Highest New Reg Quartile	0.9866	1.0154	2.88%	-30.10%	-26.47%	-19.65%	-10.67%	-4.15%	3.24%	10.40%	16.93%	28.34%	54.23%
Nursing/Residential Home Patients													
Lowest NRH Quartile	1.0371	0.9716	-6.55%	-30.54%	-30.53%	-26.87%	-22.82%	-16.47%	-4.39%	2.01%	11.75%	23.81%	62.72%
Quartile 2	1.0079	1.0030	-0.50%	-30.10%	-27.99%	-21.59%	-19.36%	-8.53%	1.05%	7.00%	16.39%	26.43%	64.41%
Quartile 3	1.0072	1.0133	0.62%	-27.18%	-26.11%	-22.32%	-20.59%	-6.75%	1.84%	9.71%	18.74%	32.84%	54.08%
Highest NRH Quartile	0.9792	1.0314	5.22%	-24.54%	-23.82%	-14.68%	-9.38%	-1.97%	5.64%	12.34%	26.89%	33.18%	51.68%
Index of Multiple Deprivation													
Lowest IMD Quartile	0.9528	1.0539	10.11%	-18.62%	-16.49%	-8.40%	-2.93%	2.06%	9.02%	16.64%	33.89%	51.91%	65.98%
Quartile 2	0.9669	1.0101	4.32%	-17.65%	-16.80%	-7.46%	-3.89%	-1.25%	3.83%	8.73%	15.13%	24.32%	51.66%
Quartile 3	1.0132	1.0074	-0.58%	-22.82%	-21.84%	-16.20%	-14.47%	-6.83%	-0.90%	6.25%	12.37%	26.11%	37.72%
Highest IMD Quartile	1.1843	1.0149	-16.94%	-30.30%	-30.28%	-26.86%	-24.76%	-21.70%	-16.10%	-7.33%	0.22%	2.85%	32.73%

Table E.2 Projected Distributional Impact of UK Proposed Age Index

Base: Age Index of NI Current Formula
Option: QResearch Model 20 Workload Factor Age Index
Source data: 2006/07 Quarter 3 payments data from NHAIS "Exeter" System

	Average Index Baseline	Average Index Option	Average % Change	Min	0.50%	5%	10%	25%	50%	75%	90%	95%	99.50%
									Percentiles				
All Practices	**1.003**	**1.002**	**-0.07%**	**-4.75%**	**-3.79%**	**-2.58%**	**-1.97%**	**-1.23%**	**-0.09%**	**1.03%**	**1.98%**	**2.72%**	**5.85%**
Practice List Size													
2,000 and under	1.0255	1.0177	-0.79%	-3.77%	-3.74%	-3.52%	-3.22%	-2.08%	-0.79%	-0.08%	1.82%	3.69%	5.98%
2,001 to 5,000	0.9997	1.0001	0.03%	-4.75%	-4.02%	-2.85%	-2.00%	-1.26%	0.08%	1.37%	2.41%	2.99%	4.92%
5,001 to 10,000	0.9978	0.9985	0.07%	-2.59%	-2.34%	-1.93%	-1.60%	-0.89%	0.11%	0.83%	1.89%	2.15%	4.15%
Over 10,000	1.0088	1.0051	-0.36%	-1.68%	-1.65%	-1.41%	-1.39%	-0.85%	-0.39%	0.36%	0.80%	1.16%	1.20%
Number of GPs in Practice													
1	1.0034	0.9996	-0.38%	-4.75%	-4.47%	-3.53%	-2.91%	-1.94%	-0.53%	1.06%	2.71%	3.66%	6.34%
2 or 3	1.0010	1.0017	0.07%	-3.62%	-3.60%	-2.47%	-1.83%	-1.05%	0.20%	1.18%	2.10%	2.71%	4.19%
4 or 5	1.0068	1.0055	-0.13%	-2.59%	-2.42%	-1.96%	-1.80%	-1.21%	-0.14%	0.64%	1.79%	2.05%	4.19%
6 or above	0.9987	0.9977	-0.09%	-1.74%	-1.73%	-1.49%	-1.36%	-0.83%	-0.30%	0.59%	1.25%	1.89%	2.37%
SLLI													
Lowest SLLI Quartile	1.0311	1.0226	-0.85%	-4.75%	-4.05%	-2.68%	-2.40%	-1.67%	-1.09%	0.16%	1.11%	1.54%	2.51%
Quartile 2	1.0151	1.0120	-0.31%	-3.77%	-3.70%	-2.73%	-2.01%	-1.37%	-0.38%	0.65%	1.68%	2.29%	4.86%
Quartile 3	0.9957	0.9976	0.18%	-3.87%	-3.76%	-2.19%	-1.56%	-0.53%	0.14%	1.33%	1.95%	2.91%	3.91%
Highest SLLI Quartile	0.9664	0.9738	0.73%	-3.54%	-3.00%	-1.87%	-1.33%	-0.12%	0.67%	1.62%	2.87%	4.07%	6.28%
Rurality - Distance to Urban Centre													
Lowest urban centre Quartile	0.9969	0.9963	-0.06%	-3.87%	-3.23%	-2.03%	-1.93%	-1.30%	-0.28%	1.13%	1.97%	3.74%	5.25%
Quartile 2	1.0266	1.0201	-0.65%	-4.75%	-4.20%	-3.45%	-2.76%	-1.70%	-0.69%	0.56%	1.48%	2.66%	4.37%
Quartile 3	0.9994	0.9999	0.05%	-3.77%	-3.48%	-1.98%	-1.57%	-0.85%	0.17%	1.08%	1.89%	2.03%	3.03%
Highest urban centre Quartile	0.9851	0.9893	0.42%	-2.93%	-2.73%	-2.23%	-1.43%	-0.44%	0.39%	1.34%	2.41%	2.87%	6.18%
Rurality - Distance to GP Practice													
Lowest GP mileage Quartile	1.0024	1.0038	0.14%	-3.60%	-3.43%	-2.24%	-1.96%	-1.28%	-0.12%	1.24%	2.96%	4.09%	5.92%
Quartile 2	1.0139	1.0091	-0.47%	-3.87%	-3.83%	-3.50%	-2.15%	-1.40%	-0.52%	0.65%	1.55%	2.09%	5.04%
Quartile 3	1.0013	0.9992	-0.21%	-4.75%	-4.01%	-2.54%	-2.04%	-0.95%	-0.11%	0.80%	1.37%	1.89%	3.35%
Highest GP mileage Quartile	0.9930	0.9953	0.23%	-2.70%	-2.68%	-2.10%	-1.62%	-0.81%	0.40%	1.46%	2.10%	2.39%	3.12%
Patients aged > 65													
Lowest (pat > 65) Quartile	0.9439	0.9580	1.41%	-3.77%	-3.01%	-0.97%	-0.33%	0.60%	1.32%	2.40%	3.67%	4.19%	6.27%
Quartile 2	0.9869	0.9882	0.13%	-2.62%	-2.56%	-2.00%	-1.46%	-0.60%	0.25%	0.88%	1.73%	1.91%	2.66%
Quartile 3	1.0195	1.0149	-0.47%	-3.60%	-3.10%	-2.12%	-1.74%	-1.32%	-0.39%	0.28%	0.97%	1.33%	2.40%
Highest (pat > 65) Quartile	1.0663	1.0512	-1.51%	-4.75%	-4.37%	-3.50%	-3.13%	-1.98%	-1.28%	-0.57%	-0.11%	0.35%	1.27%
New Registrations													
Lowest New Reg Quartile	1.0046	0.9996	-0.49%	-4.75%	-4.26%	-3.08%	-2.20%	-1.50%	-0.50%	0.62%	1.70%	2.17%	4.07%
Quartile 2	0.9982	0.9978	-0.04%	-3.87%	-3.62%	-2.60%	-1.95%	-1.10%	-0.03%	1.09%	2.01%	2.60%	5.17%
Quartile 3	1.0133	1.0107	-0.25%	-3.62%	-3.58%	-2.33%	-2.02%	-1.19%	-0.31%	0.69%	1.98%	2.31%	3.54%
Highest New Reg Quartile	0.9964	1.0002	0.39%	-3.77%	-3.69%	-1.84%	-1.55%	-0.64%	0.40%	1.26%	2.49%	3.12%	6.15%
Nursing/Residential Home Patients													
Lowest NRH Quartile	0.9631	0.9701	0.70%	-3.77%	-3.67%	-2.54%	-1.77%	-0.49%	0.90%	1.90%	3.25%	4.07%	6.29%
Quartile 2	0.9990	0.9990	0.00%	-3.53%	-3.48%	-2.19%	-1.96%	-1.10%	0.08%	0.80%	1.98%	2.42%	5.00%
Quartile 3	1.0142	1.0101	-0.41%	-3.87%	-3.61%	-2.59%	-1.95%	-1.22%	-0.45%	0.54%	1.38%	1.61%	2.41%
Highest NRH Quartile	1.0307	1.0257	-0.50%	-4.75%	-4.20%	-3.03%	-1.98%	-1.30%	-0.41%	0.53%	1.09%	1.89%	3.47%
Index of Multiple Deprivation													
Lowest IMD Quartile	1.0604	1.0505	-0.99%	-4.75%	-4.21%	-3.37%	-2.63%	-1.84%	-1.10%	-0.09%	0.85%	1.34%	2.50%
Quartile 2	1.0291	1.0279	-0.12%	-3.60%	-3.45%	-2.24%	-1.64%	-1.07%	-0.21%	1.02%	1.90%	2.05%	2.90%
Quartile 3	1.0042	1.0086	0.44%	-3.87%	-3.50%	-2.26%	-1.61%	-0.48%	0.54%	1.53%	2.37%	3.15%	5.32%
Highest IMD Quartile	0.9881	0.9940	0.59%	-2.15%	-2.10%	-1.66%	-1.39%	-0.40%	0.44%	1.41%	2.88%	3.96%	6.28%

Table E.3 Projected Distributional Impact of UK Proposed Need Index

Base: Need Index of NI Current Formula
Option: QResearch Model 20 Workload Factor Need Index
Source data: 2006/07 Quarter 3 payments data from NHAIS "Exeter" System

	Average Index Baseline	Average Index Option	Average % Change	Min	0.50%	5%	10%	25%	Percentiles 50%	75%	90%	95%	99.50%
All Practices	**1.003**	**1.001**	**-0.23%**	**-32.41%**	**-28.49%**	**-19.48%**	**-17.66%**	**-6.21%**	**3.81%**	**10.56%**	**15.91%**	**19.95%**	**27.47%**
Practice List Size													
2,000 and under	1.0177	1.0028	-1.49%	-32.41%	-31.30%	-23.81%	-16.33%	-6.85%	5.78%	9.45%	11.11%	20.54%	22.42%
2,001 to 5,000	1.0068	1.0027	-0.40%	-29.52%	-25.79%	-19.75%	-17.79%	-7.33%	3.44%	10.92%	16.37%	18.51%	26.89%
5,001 to 10,000	0.9946	0.9989	0.43%	-28.24%	-24.98%	-19.05%	-15.47%	-4.51%	3.55%	10.71%	14.20%	20.15%	27.80%
Over 10,000	1.0031	0.9987	-0.44%	-23.67%	-23.12%	-18.12%	-15.03%	-13.82%	5.30%	10.94%	15.51%	20.34%	20.57%
Number of GPs in Practice													
1	1.0251	1.0032	-2.19%	-32.41%	-30.75%	-23.68%	-17.19%	-7.96%	2.58%	9.00%	13.55%	17.57%	22.16%
2 or 3	1.0023	1.0014	-0.09%	-29.52%	-28.40%	-19.05%	-17.66%	-7.07%	4.11%	11.04%	15.90%	17.57%	26.72%
4 or 5	0.9921	0.9987	0.66%	-23.23%	-22.83%	-19.87%	-16.50%	-4.32%	4.20%	10.66%	14.07%	20.15%	28.25%
6 or above	0.9980	1.0017	0.37%	-23.67%	-22.87%	-18.42%	-16.88%	-4.95%	5.02%	11.41%	20.22%	21.02%	24.65%
SLLI													
Lowest SLLI Quartile	0.8524	0.9798	12.74%	6.80%	7.12%	8.40%	9.10%	11.16%	14.69%	17.86%	22.09%	24.52%	29.82%
Quartile 2	0.9270	0.9921	6.50%	0.33%	0.38%	2.51%	3.10%	4.81%	6.58%	9.48%	11.10%	12.82%	13.60%
Quartile 3	1.0140	1.0028	-1.12%	-8.98%	-8.68%	-7.34%	-6.09%	-3.40%	-0.48%	1.70%	3.54%	4.44%	7.51%
Highest SLLI Quartile	1.2310	1.0312	-19.98%	-32.41%	-31.13%	-24.80%	-22.25%	-18.98%	-16.23%	-12.04%	-7.08%	-5.70%	-4.51%
Rurality - Distance to Urban Centre													
Lowest urban centre Quartile	1.1472	1.0272	-12.01%	-32.41%	-31.13%	-24.80%	-21.91%	-18.71%	-14.94%	5.63%	11.14%	13.16%	24.08%
Quartile 2	0.9577	0.9996	4.19%	-15.52%	-15.49%	-12.88%	-9.27%	0.38%	5.95%	12.24%	16.22%	22.02%	28.33%
Quartile 3	0.9395	0.9887	4.91%	-22.30%	-22.05%	-12.15%	-6.00%	0.42%	8.05%	13.53%	17.77%	20.04%	26.64%
Highest urban centre Quartile	0.9693	0.9884	1.91%	-19.10%	-18.51%	-12.81%	-10.11%	-4.10%	3.51%	9.89%	13.61%	17.28%	22.63%
Rurality - Distance to GP Practice													
Lowest GP mileage Quartile	1.0506	1.0119	-3.88%	-32.41%	-31.03%	-22.49%	-19.53%	-15.47%	3.87%	10.30%	13.45%	18.07%	28.80%
Quartile 2	1.0310	1.0093	-2.16%	-28.24%	-27.76%	-20.64%	-17.59%	-7.81%	1.85%	8.21%	12.63%	15.97%	21.40%
Quartile 3	0.9847	0.9978	1.32%	-23.67%	-22.56%	-17.12%	-14.26%	-5.24%	3.40%	12.40%	16.86%	20.01%	23.49%
Highest GP mileage Quartile	0.9431	0.9844	4.13%	-19.10%	-19.06%	-12.99%	-6.82%	-0.31%	6.30%	11.17%	19.79%	21.16%	27.87%
Patients aged > 65													
Lowest (pat > 65) Quartile	1.1044	1.0122	-9.22%	-32.41%	-31.07%	-24.15%	-21.81%	-17.45%	-5.75%	2.62%	10.86%	15.25%	24.72%
Quartile 2	1.0084	1.0004	-0.80%	-24.51%	-23.24%	-19.03%	-17.31%	-6.85%	3.25%	8.33%	12.31%	16.18%	22.07%
Quartile 3	0.9360	0.9908	5.48%	-18.64%	-18.22%	-9.73%	-4.48%	0.77%	8.09%	13.07%	16.10%	20.13%	23.56%
Highest (pat > 65) Quartile	0.9564	1.0003	4.39%	-20.90%	-20.16%	-17.37%	-9.14%	-0.12%	8.04%	13.49%	20.11%	22.75%	29.86%
New Registrations													
Lowest New Reg Quartile	1.0834	1.0121	-7.13%	-29.52%	-27.73%	-21.87%	-20.07%	-17.82%	-5.59%	8.87%	13.61%	17.85%	22.26%
Quartile 2	0.9990	0.9990	-0.01%	-32.41%	-27.91%	-18.41%	-15.57%	-5.26%	3.06%	10.64%	14.17%	16.60%	25.20%
Quartile 3	0.9637	0.9956	3.18%	-28.24%	-25.75%	-15.57%	-10.52%	0.09%	6.13%	10.33%	18.78%	20.76%	27.51%
Highest New Reg Quartile	0.9761	0.9990	2.28%	-27.13%	-24.76%	-17.26%	-13.00%	-2.64%	4.89%	11.92%	16.53%	20.43%	28.77%
Nursing/Residential Home Patients													
Lowest NRH Quartile	1.0801	1.0085	-7.16%	-32.41%	-31.19%	-23.56%	-21.84%	-15.88%	-2.93%	6.77%	11.17%	17.28%	26.70%
Quartile 2	1.0065	0.9996	-0.69%	-27.13%	-24.12%	-18.94%	-17.05%	-7.14%	3.09%	9.36%	13.79%	18.98%	22.79%
Quartile 3	0.9908	1.0006	0.99%	-24.51%	-23.09%	-17.84%	-17.51%	-3.94%	3.67%	12.17%	16.39%	21.36%	23.71%
Highest NRH Quartile	0.9440	0.9966	5.26%	-18.82%	-18.73%	-8.34%	-6.47%	2.50%	7.99%	12.57%	16.80%	20.36%	29.78%
Index of Multiple Deprivation													
Lowest IMD Quartile	0.9108	1.0034	9.26%	-10.30%	-9.00%	-4.00%	2.12%	6.40%	11.18%	16.25%	20.32%	22.24%	27.94%
Quartile 2	0.9531	1.0118	5.86%	-12.57%	-11.42%	-5.10%	-0.61%	1.52%	6.27%	11.27%	15.42%	17.55%	27.80%
Quartile 3	1.0243	1.0154	-0.89%	-22.12%	-20.33%	-13.77%	-12.56%	-5.94%	-0.31%	6.70%	11.00%	13.62%	15.77%
Highest IMD Quartile	1.2218	1.0537	-16.81%	-32.30%	-31.05%	-24.76%	-21.91%	-18.83%	-15.38%	-5.55%	2.71%	5.36%	20.11%

APPENDIX F: Issues with Acquiring & Analysing NI GP Expenses Data

F.1 For the Deloitte modelling, practice total costs per patient and practice total expenses per patient were made available at practice level from Her Majesty's Revenue and Customs (HMRC) data (Inland Revenue Inquiry), the latest data available at the time of modelling being 2002/03.

F.2 N Ireland was excluded from the Deloitte modelling. Seeking to include NI data would have been disproportionately time consuming while adding only a small proportion of the total practice population to the analysis. Deloitte concluded that there did not appear to be any aspects of the geographical dispersion of population specific to N Ireland that would greatly influence a national formula and so it would be a disproportionate cost to pursue inclusion.

F.3 Initially the intention was to replicate the Deloitte work for NI practices to prove whether the Deloitte results are applicable in N Ireland. However, there were a number of issues with acquiring and analysing NI Inland Revenue GP ***expenses*** data:

- N Ireland GPs were only included in the Inland Revenue Inquiry for the first time in 2002/03 and much data was missing due to National Insurance numbers being omitted or incorrectly formatted. Even though the second year of data (2003/04) was of better quality, HMRC advised that the small sample size (only 67 NI practices) and continuing data quality issues made any NI specific analysis unreliable.

- Although the NHS Information Centre own the Inland Revenue data extract, they are not allowed to hold a copy of the extract due to HMRC confidentiality rules. Any analyses on the data must therefore be done on-site at HMRC premises in London, aggregated to GP practice level and anonymised before being taken away.

F.4 Deloitte's analysis of relationships between practice costs and list sizes showed that ***total costs per patient*** and ***total expenses per patient*** followed the same trend with the pattern for costs simply being higher per patient than expenses per patient. Given this pattern it was agreed that the Deloitte analysis could be replicated for NI data but considering only total costs per patient as opposed to total expenses and total costs per patient separately.

APPENDIX G: Economies of Scale Analysis for N Ireland GP Practices

G.1 Table G.1 shows the cost per patient having distinguished between those practices with and without dispensing status and practices below and above a list size of 1,900.

Table G.1 Summary Statistics for Cost Data (Dispensing Payments Included)

Below 1,900 list size		Dispensing	Non-Dispensing	All
Number of Practices		3	30	33
Cost per Patient	Mean	£340.18	£69.06	£93.71
	Median	£353.32	£65.76	£67.12
	St Deviation	£65.29	£19.58	£82.94

Above 1,900 list size		Dispensing	Non-Dispensing	All
Number of Practices		18	299	317
Cost per Patient	Mean	£176.13	£61.97	£68.45
	Median	£178.82	£60.70	£61.02
	St Deviation	£58.85	£13.06	£32.36

All Practices		Dispensing	Non-Dispensing	All
Number of Practices		21	329	350
Cost per Patient	Mean	£199.57	£62.61	£70.83
	Median	£185.01	£60.93	£61.44
	St Deviation	£82.64	£13.90	£40.42

G.2 Deloitte's analysis distinguishes between practices with list sizes below and above 1,900 since cost per patient begins to increase rapidly at list sizes below approximately 1,900. This also had clear rationale as the average number of patients on an individual GP's list was just under 1,900.

G.3 Deloitte's analysis distinguished between practices with and without dispensing status because the costs of dispensing medicines to patients increases the cost per patient and their data did not allow them to quantify the costs of dispensing alone. In line with the GB analysis, Table G.1 shows that cost per patient is higher for dispensing practices and that there is more variation in costs for such practices. Also in line with GB results, cost per patient is higher for practices of list size below 1,900.

G.4 As the NI dataset is itemised by individual payment, the NI analysis can quantify and therefore exclude dispensing costs. Table G.2 shows summary statistics again having excluded dispensing costs. All subsequent analyses are based on the exclusion of dispensing costs.

Table G.2 Summary Statistics for Cost Data (Dispensing payments excluded)

Below 1,900 list size		Dispensing	Non-Dispensing	All
Number of Practices		3	30	33
Cost per Patient	Mean	£73.23	£69.06	£69.44
	Median	£70.01	£65.76	£66.21
	St Deviation	£9.08	£19.58	£18.82

Above 1,900 list size		Dispensing	Non-Dispensing	All
Number of Practices		18	299	317
Cost per Patient	Mean	£68.17	£61.97	£62.32
	Median	£68.09	£60.70	£60.87
	St Deviation	£8.70	£13.06	£12.93

All Practices		Dispensing	Non-Dispensing	All
Number of Practices		21	329	350
Cost per Patient	Mean	£68.90	£62.61	£62.99
	Median	£68.18	£60.93	£61.30
	St Deviation	£8.71	£13.90	£13.71

G.5 There is much less difference in costs between dispensing and non-dispensing practices having excluded actual dispensing costs and therefore made the two types of practices comparable. The results continue to show that cost per patient is higher for practices of list size below 1,900. The results also continue to show that cost per patient is higher for dispensing practices compared to non-dispensing practices despite the figures being on a comparable basis. This indicates that higher costs for dispensing practices may not only be due to costs associated with dispensing but there may be other costs which are systematically higher for dispensing practices.

Potential magnitude of Additional Funding at Small List Sizes

G.6 In order to assess the magnitude of differences and thus the potential additional funding, we have analysed the differences in means and the total practice population in 3 bands. In N Ireland, as is the case in GB, the behaviour of costs appears to change as list sizes move beyond approximately 1,900. Looking at the moving average (Figure G.1), it is evident that costs fall as list sizes increase to 2,100 but that the rate of decrease greatly reduces at larger list sizes. A second break-point is indicated at 4,250 in order to indicate the difference between “medium” and “large” practices.

Figure G.1 Average Total Costs per Patient with Plot of Moving Average

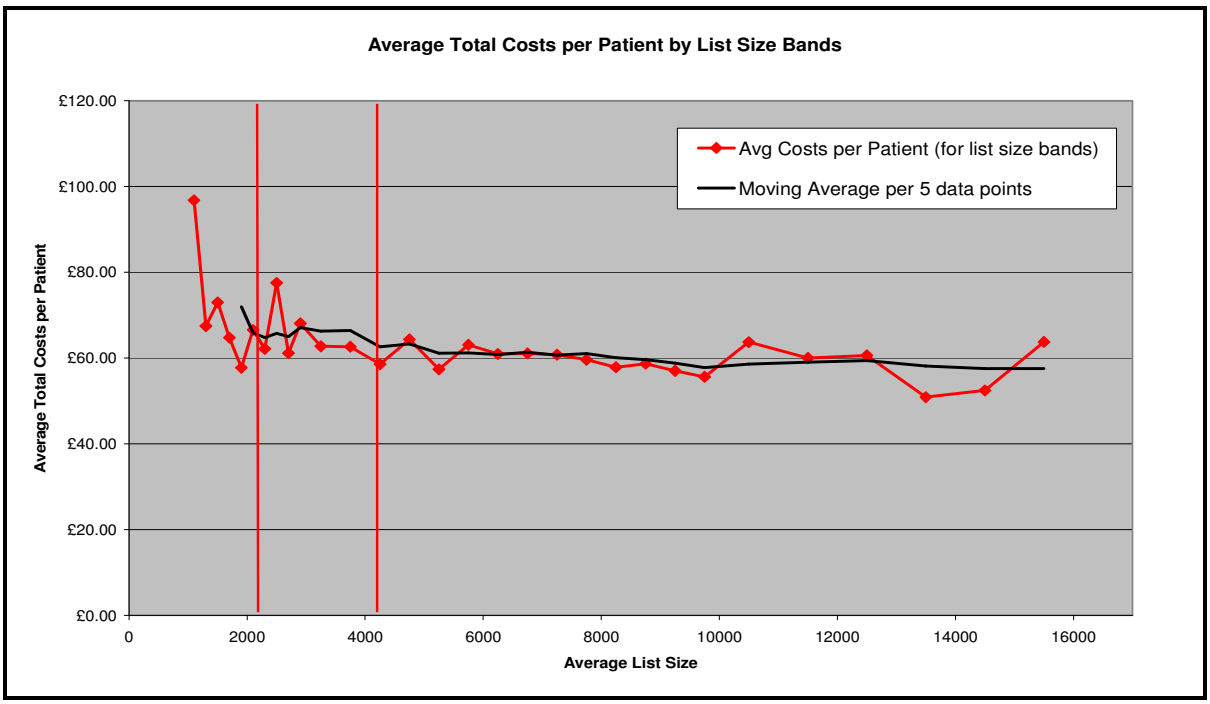


Table G.3 Weighted Mean Costs per Patient for each Band Dispensing Costs Included

Dispensing Practices

	Mean £ per Patient		
	Up to 2,100	2,100 to 4,250	Above 4,250
Costs	£345.10	£181.12	£166.55

Non-Dispensing Practices

	Mean £ per Patient		
	Up to 2,100	2,100 to 4,250	Above 4,250
Costs	£65.66	£63.47	£60.51

All Practices

	Mean £ per Patient		
	Up to 2,100	2,100 to 4,250	Above 4,250
Costs	£84.97	£75.63	£62.50

G.7 The weighted average cost for each list band including dispensing costs is summarised in Table G.3. Table G.3 is consistent with the Deloitte Report in that dispensing costs have been included. For non-dispensing practices, there are little differences across the 3 list bands; but for dispensing practices there is a notable difference between bands 1 and 2. There are notable differences between dispensing and non-dispensing practices across the 3 list bands, the differences increasing as list size decreases. As it is possible in the NI dataset to separate out dispensing costs we can produce the same analysis having

excluded dispensing costs. Table G.4 summarises the weighted average cost for each band when dispensing costs are excluded. Only small differences now remain with weighted mean costs still being slightly higher for dispensing practices compared to non-dispensing practices. This again may indicate that there are other costs which may be systemically higher for dispensing practices.

Table G.4 Weighted Mean Costs per Patient for each Band Dispensing Costs Excluded

Dispensing Practices

	Mean £ per Patient		
	Up to 2,100	2,100 to 4,250	Above 4,250
Costs	£73.68	£66.45	£72.39

Non-Dispensing Practices

	Mean £ per Patient		
	Up to 2,100	2,100 to 4,250	Above 4,250
Costs	£65.66	£63.47	£60.51

All Practices

	Mean £ per Patient		
	Up to 2,100	2,100 to 4,250	Above 4,250
Costs	£66.21	£63.78	£60.74

APPENDIX H: Distributional Impact Tables – Cost of Unavoidable Smallness

Table H.1 Summary Cost of Unavoidable Smallness Index (modelled on Qtr 3, 2006/07 data)

Number of Practices Gaining	10 (2.7%)
Deloitte (CUS) Adjustment Index	
Minimum	1.000
1st Percentile	1.000
5th Percentile	1.000
10th Percentile	1.000
25th Percentile	1.000
Median	1.000
75th Percentile	1.000
90th Percentile	1.000
95th Percentile	1.000
99th Percentile	1.120
99.1th Percentile	1.131
99.2th Percentile	1.138
99.3th Percentile	1.139
99.4th Percentile	1.140
99.5th Percentile	1.158
99.6th Percentile	1.190
99.7th Percentile	1.222
99.8th Percentile	1.238
99.9th Percentile	1.249
Maximum	1.259
Average Deloitte (CUS) Adjustment Index for practices in:	
Top Quartile SLLI (Deprived)	1.000
Bottom Quartile SLLI (Non-Deprived)	1.005
Top Quartile Density (Urban)	1.000
Bottom Quartile Density (Rural)	1.006
Urban Deprived	1.000
Urban Non-Deprived	1.000
Rural Deprived	1.006
Rural Non-Deprived	

Table H.2 Ranked Cost of Unavoidable Smallness Index for 10 Practices Expected to Gain

Rank	Index
1	1.259
2	1.230
3	1.141
4	1.138
5	1.109
6	1.077
7	1.059
8	1.037
9	1.028
10	1.009

APPENDIX I: Distributional Impact Tables

Table I.1 Summary Original NI Rurality Index & Original NI Rurality without Economies of Scale incorporated (modelled on Qtr 3, 2006/07 data)

	NI Rurality Index	NI Rurality Index (without econ of scale)
Number of Practices Gaining	183 (50.4%)	178 (49.0%)
NI Rurality Adjustment Index		
Minimum	0.928	0.938
1st Percentile	0.938	0.946
5th Percentile	0.948	0.953
10th Percentile	0.951	0.957
25th Percentile	0.965	0.969
Median	0.998	0.997
75th Percentile	1.028	1.024
90th Percentile	1.056	1.050
95th Percentile	1.063	1.060
99th Percentile	1.086	1.082
99.1th Percentile	1.086	1.083
99.2th Percentile	1.088	1.085
99.3th Percentile	1.094	1.092
99.4th Percentile	1.100	1.098
99.5th Percentile	1.104	1.101
99.6th Percentile	1.105	1.101
99.7th Percentile	1.105	1.102
99.8th Percentile	1.107	1.103
99.9th Percentile	1.109	1.105
Maximum	1.111	1.107
Average NI Rurality Index for practices in:		
Top Quartile SLLI (Deprived)	0.985	0.987
Bottom Quartile SLLI (Non-Deprived)	0.998	0.998
Top Quartile Density (Urban)	0.967	0.970
Bottom Quartile Density (Rural)	1.039	1.038
Urban Deprived	0.962	0.965
Urban Non-Deprived	0.959	0.963
Rural Deprived	1.034	1.033
Rural Non-Deprived	1.034	1.034

Table I.2 Ranked Rurality Index for Top 10 Practices Expected to Gain

Rank	NI Rurality Index	Rurality Index (without econ of scale)
1	1.111	1.107
2	1.106	1.102
3	1.103	1.101
4	1.086	1.083
5	1.085	1.081
6	1.082	1.080
7	1.072	1.069
8	1.071	1.068
9	1.071	1.067
10	1.070	1.066

Table I.3 Summary Rurality + Cost of Unavoidable Smallness Index (modelled on Qtr 3, 2006/07 data)

Number of Practices Gaining	176 (48.5%)
NI Rurality Adjustment Index	
Minimum	0.939
1st Percentile	0.947
5th Percentile	0.954
10th Percentile	0.958
25th Percentile	0.970
Median	0.999
75th Percentile	1.028
90th Percentile	1.055
95th Percentile	1.067
99th Percentile	1.152
99.1th Percentile	1.158
99.2th Percentile	1.167
99.3th Percentile	1.182
99.4th Percentile	1.196
99.5th Percentile	1.216
99.6th Percentile	1.240
99.7th Percentile	1.265
99.8th Percentile	1.271
99.9th Percentile	1.272
Maximum	1.273
Average NI Rurality Adjustment Index for practices in:	
Top Quartile SLLI (Deprived)	0.988
Bottom Quartile SLLI (Non-Deprived)	1.004
Top Quartile Density (Urban)	0.971
Bottom Quartile Density (Rural)	1.045
Urban Deprived	0.967
Urban Non-Deprived	0.964
Rural Deprived	1.034
Rural Non-Deprived	1.042

Table I.4 Ranked Rurality + CUS Index for Top 10 Practices Expected to Gain

Rank	Index
1	1.273
2	1.270
3	1.203
4	1.164
5	1.145
6	1.108
7	1.103
8	1.103
9	1.092
10	1.090

Figure I.1 Distribution of New Deloitte Cost of Unavoidable Smallness Adjustment

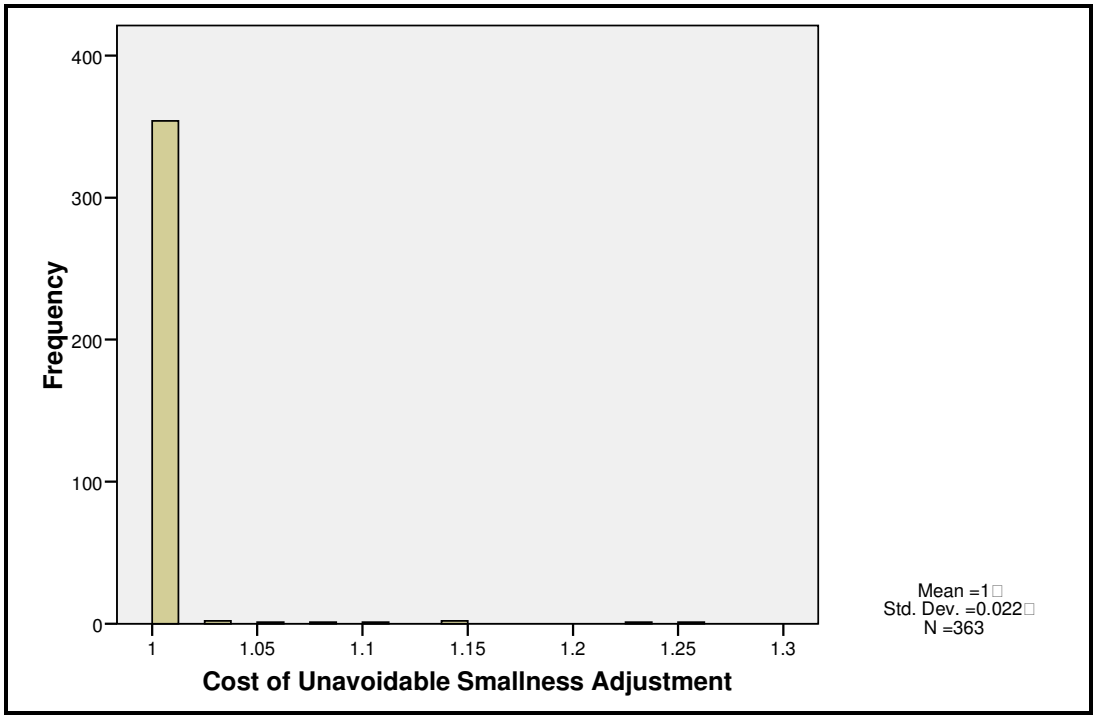


Figure I.2 Distribution of NI Original Rurality Adjustment

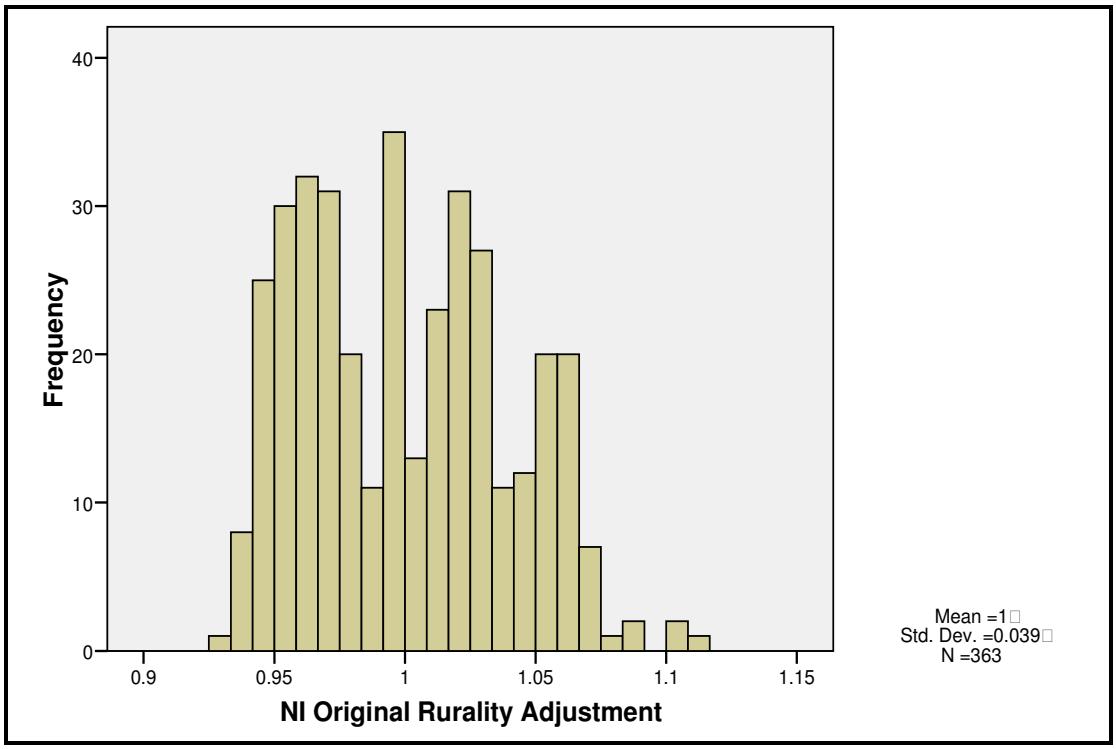


Figure I.3 Distribution of Original NI Rurality Adjustment (if economies of scale had not been taken into account)

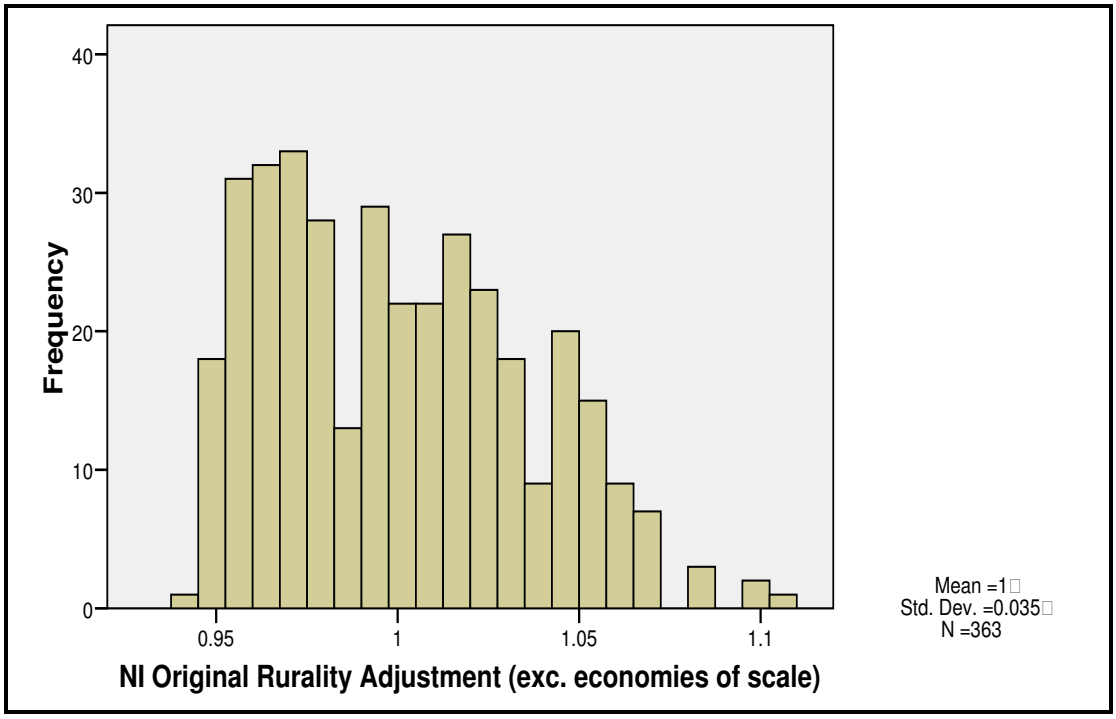
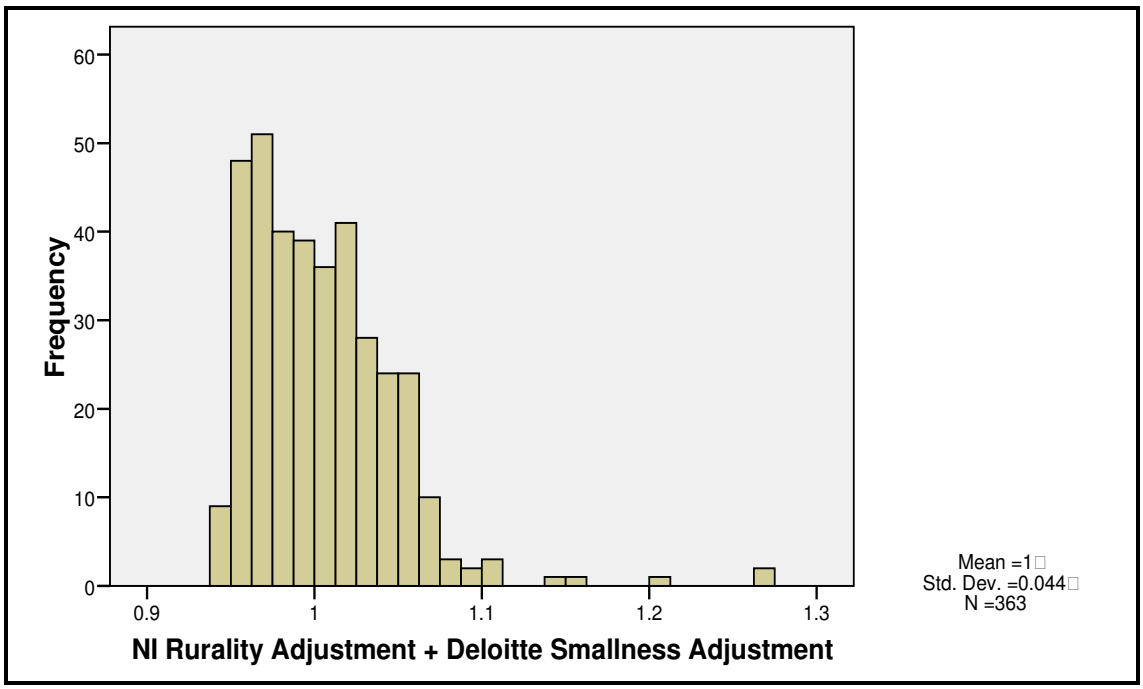


Figure I.4 Distribution of Combined Original NI Rurality Adjustment Plus New Deloitte Cost of Unavoidable Smallness Adjustment



APPENDIX J: Distributional Impact Table – Recommended Formula

Table J.1 Projected Distributional Impact of Recommended NI Formula versus Current NI Global Sum Formula

Base: Combined Indices of Current NI Global Sum Formula
Option: Combined Indices of Recommended NI Revised Global Sum Formula (Retaining Rurality)
Source data: 2006/07 Quarter 3 payments data from NHAIS "Exeter" System

	Average Index Baseline	Average Index Option	Average % Change	Percentiles									
				Min	0.50%	5%	10%	25%	50%	75%	90%	95%	99.50%
All Practices	**1.010**	**1.012**	**0.27%**	**-7.38%**	**-4.21%**	**-2.24%**	**-1.56%**	**-0.83%**	**0.14%**	**0.96%**	**1.98%**	**2.58%**	**16.56%**
Practice List Size													
2,000 and under	1.0565	1.0853	2.88%	-5.08%	-4.73%	-2.37%	-0.94%	-0.14%	1.22%	2.79%	12.14%	14.75%	26.75%
2,001 to 5,000	1.0132	1.0127	-0.06%	-4.00%	-3.61%	-2.34%	-1.78%	-1.08%	0.12%	0.96%	1.80%	2.14%	3.14%
5,001 to 10,000	0.9925	0.9909	-0.15%	-7.38%	-4.74%	-1.94%	-1.37%	-0.77%	-0.11%	0.71%	1.26%	1.82%	2.57%
Over 10,000	0.9943	0.9961	0.17%	-1.95%	-1.86%	-1.02%	-0.95%	-0.60%	0.30%	0.87%	1.42%	2.45%	2.48%
Number of GPs in Practice													
1	1.0365	1.0530	1.65%	-5.08%	-4.59%	-2.94%	-1.92%	-0.56%	0.42%	1.83%	4.23%	14.18%	26.40%
2 or 3	1.0120	1.0117	-0.03%	-4.00%	-3.40%	-2.10%	-1.58%	-0.95%	0.12%	0.87%	1.71%	2.19%	3.56%
4 or 5	0.9975	0.9976	0.00%	-7.38%	-5.61%	-2.20%	-1.34%	-0.62%	-0.09%	0.93%	1.74%	2.21%	2.58%
6 or above	0.9803	0.9793	-0.10%	-1.95%	-1.94%	-1.74%	-1.57%	-0.89%	0.01%	0.72%	1.31%	1.96%	2.48%
SLLI													
Lowest SLLI Quartile	0.8885	0.9001	1.16%	-7.38%	-4.91%	-1.19%	-0.59%	0.02%	0.94%	1.80%	2.54%	2.83%	20.83%
Quartile 2	0.9601	0.9696	0.96%	-3.40%	-2.98%	-1.22%	-0.90%	-0.41%	0.47%	1.13%	2.35%	2.84%	19.78%
Quartile 3	1.0288	1.0288	0.00%	-4.00%	-3.10%	-1.65%	-1.39%	-0.85%	0.02%	0.50%	1.02%	1.40%	5.70%
Highest SLLI Quartile	1.1703	1.1591	-1.12%	-5.08%	-4.39%	-3.17%	-2.58%	-1.77%	-1.04%	-0.10%	0.64%	1.36%	1.85%
Rurality - Distance to Urban Centre													
Lowest urban centre Quartile	1.0996	1.0967	-0.29%	-7.38%	-6.36%	-2.92%	-2.40%	-1.32%	0.01%	1.11%	1.81%	2.54%	2.89%
Quartile 2	0.9815	0.9857	0.41%	-4.00%	-3.66%	-1.71%	-1.20%	-0.63%	0.53%	1.50%	2.24%	2.48%	2.85%
Quartile 3	0.9652	0.9663	0.11%	-2.53%	-2.49%	-1.74%	-1.24%	-0.51%	0.19%	0.74%	1.26%	1.59%	3.80%
Highest urban centre Quartile	0.9923	1.0004	0.81%	-3.53%	-3.47%	-1.92%	-1.40%	-0.83%	-0.26%	0.64%	1.79%	10.53%	25.95%
Rurality - Distance to GP Practice													
Lowest GP mileage Quartile	1.0249	1.0219	-0.30%	-7.38%	-6.28%	-3.32%	-2.66%	-1.28%	-0.09%	1.15%	2.19%	2.46%	2.69%
Quartile 2	1.0418	1.0457	0.40%	-3.53%	-3.03%	-1.86%	-1.39%	-0.77%	0.27%	1.39%	2.05%	2.58%	10.27%
Quartile 3	0.9958	1.0000	0.42%	-2.07%	-2.02%	-1.66%	-1.15%	-0.55%	-0.02%	0.74%	1.51%	2.35%	18.72%
Highest GP mileage Quartile	0.9754	0.9816	0.62%	-1.99%	-1.91%	-1.44%	-1.32%	-0.62%	0.20%	0.77%	1.59%	2.92%	19.87%
Patients aged > 65													
Lowest (pat > 65) Quartile	1.0411	1.0250	-1.61%	-7.38%	-6.31%	-3.35%	-2.77%	-1.93%	-1.27%	-0.84%	-0.48%	-0.26%	0.14%
Quartile 2	1.0011	1.0021	0.10%	-1.69%	-1.65%	-1.34%	-1.20%	-0.59%	-0.16%	0.28%	0.80%	1.40%	16.39%
Quartile 3	0.9674	0.9775	1.02%	-1.37%	-1.22%	-0.61%	-0.41%	0.15%	0.53%	0.96%	1.47%	1.76%	22.01%
Highest (pat > 65) Quartile	1.0278	1.0452	1.74%	-0.20%	-0.18%	0.22%	0.42%	0.90%	1.51%	2.26%	2.74%	2.93%	10.90%
New Registrations													
Lowest New Reg Quartile	1.0679	1.0730	0.52%	-3.28%	-3.09%	-1.86%	-1.43%	-0.84%	0.27%	1.35%	2.29%	2.89%	17.61%
Quartile 2	0.9987	1.0044	0.58%	-5.08%	-4.22%	-2.12%	-1.59%	-0.81%	0.35%	0.97%	2.24%	2.72%	21.25%
Quartile 3	0.9856	0.9900	0.45%	-2.39%	-2.34%	-1.66%	-1.21%	-0.62%	0.37%	1.27%	2.08%	2.57%	8.97%
Highest New Reg Quartile	0.9939	0.9900	-0.39%	-7.38%	-5.72%	-2.54%	-2.03%	-1.06%	-0.26%	0.31%	1.17%	1.85%	2.69%
Nursing/Residential Home Patients													
Lowest NRH Quartile	1.0387	1.0322	-0.66%	-7.38%	-6.40%	-3.31%	-2.64%	-1.80%	-0.86%	0.33%	1.55%	1.85%	14.12%
Quartile 2	1.0108	1.0132	0.24%	-4.00%	-3.71%	-1.60%	-1.27%	-0.85%	-0.17%	0.85%	1.79%	2.72%	16.14%
Quartile 3	1.0040	1.0100	0.60%	-2.07%	-1.98%	-1.25%	-0.96%	-0.46%	0.35%	1.00%	1.65%	2.07%	17.71%
Highest NRH Quartile	0.9883	0.9966	0.84%	-2.63%	-2.57%	-1.51%	-0.85%	0.00%	0.61%	1.46%	2.50%	2.62%	11.15%
Index of Multiple Deprivation													
Lowest IMD Quartile	0.9337	0.9437	1.00%	-1.23%	-1.21%	-0.72%	-0.33%	0.26%	1.02%	1.84%	2.51%	2.62%	2.92%
Quartile 2	0.9660	0.9733	0.73%	-2.07%	-1.84%	-1.18%	-0.99%	-0.54%	0.28%	0.94%	1.74%	3.37%	21.33%
Quartile 3	1.0141	1.0166	0.25%	-4.00%	-3.76%	-1.99%	-1.75%	-1.07%	-0.38%	0.42%	1.21%	2.72%	20.39%
Highest IMD Quartile	1.1441	1.1345	-0.96%	-7.38%	-6.39%	-3.31%	-2.66%	-1.58%	-0.92%	0.03%	0.81%	1.32%	5.17%

Table J.2 Projected Distributional Impact of Recommended NI Formula (Neutralising Rurality) versus Current NI Global Sum Formula

Base: Combined Indices of Current NI Global Sum Formula
Option: Combined Indices of Recommended NI Revised Global Sum Formula (Neutralising Rurality)
Source data: 2006/07 Quarter 3 payments data from NHAIS "Exeter" System

	Average Index Baseline	Average Index Option	Average % Change	Percentiles									
				Min	0.50%	5%	10%	25%	50%	75%	90%	95%	99.50%
All Practices	**1.010**	**1.010**	**0.06%**	**-11.34%**	**-9.85%**	**-6.68%**	**-5.70%**	**-3.04%**	**0.13%**	**2.99%**	**4.82%**	**5.67%**	**14.86%**
Practice List Size													
2,000 and under	1.0565	1.0823	2.58%	-6.70%	-6.49%	-5.59%	-4.68%	-2.11%	2.62%	4.75%	5.63%	13.57%	24.30%
2,001 to 5,000	1.0132	1.0070	-0.63%	-11.34%	-11.02%	-6.86%	-6.02%	-3.83%	-0.62%	2.22%	4.16%	5.64%	7.65%
5,001 to 10,000	0.9925	0.9915	-0.09%	-8.75%	-8.57%	-6.62%	-5.85%	-2.82%	0.11%	2.58%	4.68%	5.25%	7.32%
Over 10,000	0.9943	1.0078	1.35%	-3.81%	-3.79%	-3.54%	-2.36%	-0.39%	0.99%	3.67%	4.81%	5.00%	7.70%
Number of GPs in Practice													
1	1.0365	1.0473	1.08%	-7.12%	-6.99%	-6.20%	-5.65%	-3.25%	1.25%	3.90%	6.10%	10.79%	23.65%
2 or 3	1.0120	1.0054	-0.66%	-11.34%	-11.01%	-7.17%	-6.06%	-3.77%	-0.62%	2.10%	4.32%	5.46%	7.63%
4 or 5	0.9975	1.0007	0.31%	-7.59%	-7.30%	-6.33%	-5.30%	-2.76%	0.83%	3.48%	4.97%	5.47%	7.37%
6 or above	0.9803	0.9919	1.17%	-5.85%	-5.50%	-3.10%	-2.24%	-0.44%	1.00%	3.56%	4.25%	4.87%	7.49%
SLLI													
Lowest SLLI Quartile	0.8885	0.8992	1.07%	-7.71%	-7.31%	-5.69%	-4.60%	-1.81%	0.99%	3.93%	6.24%	7.32%	17.51%
Quartile 2	0.9601	0.9596	-0.04%	-8.75%	-8.62%	-6.76%	-6.01%	-3.53%	0.04%	2.45%	4.98%	5.38%	16.78%
Quartile 3	1.0288	1.0171	-1.17%	-11.34%	-11.18%	-6.90%	-6.02%	-3.05%	-1.39%	1.55%	3.98%	4.67%	5.38%
Highest SLLI Quartile	1.1703	1.1730	0.27%	-9.59%	-8.81%	-6.45%	-5.67%	-3.23%	1.15%	3.27%	4.35%	5.37%	6.01%
Rurality - Distance to Urban Centre													
Lowest urban centre Quartile	1.0996	1.1362	3.66%	-2.92%	-2.72%	-0.08%	0.74%	1.80%	3.65%	4.82%	6.12%	7.17%	8.10%
Quartile 2	0.9815	0.9976	1.60%	-4.82%	-4.46%	-2.92%	-1.19%	0.11%	1.87%	3.42%	4.58%	5.06%	5.54%
Quartile 3	0.9652	0.9392	-2.59%	-8.47%	-8.16%	-6.92%	-6.36%	-4.82%	-2.76%	-0.62%	1.32%	1.64%	3.30%
Highest urban centre Quartile	0.9923	0.9647	-2.76%	-11.34%	-11.17%	-7.71%	-6.80%	-5.89%	-3.30%	-1.51%	0.98%	5.62%	22.80%
Rurality - Distance to GP Practice													
Lowest GP mileage Quartile	1.0249	1.0511	2.61%	-7.84%	-7.29%	-4.19%	-2.00%	1.31%	3.05%	4.74%	6.01%	7.10%	8.09%
Quartile 2	1.0418	1.0546	1.28%	-7.57%	-7.19%	-6.33%	-4.58%	-0.94%	1.95%	3.87%	4.77%	5.50%	10.45%
Quartile 3	0.9958	0.9900	-0.58%	-7.48%	-7.20%	-5.25%	-4.22%	-2.42%	-0.65%	0.82%	2.63%	3.26%	16.72%
Highest GP mileage Quartile	0.9754	0.9421	-3.33%	-11.34%	-11.18%	-8.21%	-6.97%	-5.78%	-3.63%	-1.73%	0.10%	2.10%	15.92%
Patients aged > 65													
Lowest (pat > 65) Quartile	1.0411	1.0217	-1.93%	-11.34%	-11.16%	-7.67%	-7.03%	-5.17%	-0.95%	1.29%	3.02%	3.55%	4.35%
Quartile 2	1.0011	0.9948	-0.63%	-7.71%	-7.32%	-6.35%	-5.70%	-3.17%	-1.48%	2.03%	4.14%	5.42%	13.23%
Quartile 3	0.9674	0.9714	0.41%	-8.75%	-7.72%	-5.68%	-5.57%	-2.59%	0.59%	2.68%	4.81%	7.17%	20.54%
Highest (pat > 65) Quartile	1.0278	1.0540	2.62%	-5.76%	-5.27%	-3.98%	-3.08%	0.59%	2.95%	4.78%	5.64%	6.29%	8.10%
New Registrations													
Lowest New Reg Quartile	1.0679	1.0817	1.38%	-8.47%	-7.71%	-6.04%	-5.65%	-2.65%	2.01%	4.14%	5.69%	6.38%	14.89%
Quartile 2	0.9987	0.9971	-0.16%	-10.96%	-10.29%	-7.15%	-6.43%	-3.35%	-0.21%	2.92%	4.96%	6.99%	19.83%
Quartile 3	0.9856	0.9864	0.08%	-11.34%	-9.84%	-6.27%	-4.14%	-2.17%	0.08%	2.63%	4.22%	5.36%	6.89%
Highest New Reg Quartile	0.9939	0.9857	-0.82%	-7.84%	-7.33%	-6.45%	-5.44%	-3.67%	-0.84%	2.13%	3.97%	4.68%	5.87%
Nursing/Residential Home Patients													
Lowest NRH Quartile	1.0387	1.0221	-1.66%	-11.34%	-11.18%	-7.58%	-6.86%	-5.15%	-1.81%	1.58%	3.86%	4.14%	10.65%
Quartile 2	1.0108	1.0090	-0.18%	-8.75%	-8.25%	-6.48%	-5.66%	-2.98%	-0.46%	2.44%	5.02%	5.68%	13.49%
Quartile 3	1.0040	1.0153	1.13%	-6.87%	-6.86%	-5.74%	-4.78%	-1.44%	1.57%	3.78%	4.95%	5.70%	18.44%
Highest NRH Quartile	0.9883	0.9975	0.92%	-7.84%	-7.21%	-5.69%	-4.44%	-2.04%	1.17%	3.88%	5.16%	6.18%	9.85%
Index of Multiple Deprivation													
Lowest IMD Quartile	0.9337	0.9531	1.95%	-7.71%	-6.77%	-4.36%	-3.09%	-0.29%	2.38%	4.69%	5.99%	7.10%	8.09%
Quartile 2	0.9660	0.9595	-0.66%	-8.47%	-7.81%	-6.29%	-5.58%	-3.19%	-1.20%	1.56%	3.26%	4.02%	17.02%
Quartile 3	1.0141	0.9971	-1.71%	-8.75%	-8.24%	-6.80%	-6.35%	-4.42%	-2.43%	-0.21%	3.45%	4.82%	17.14%
Highest IMD Quartile	1.1441	1.1494	0.53%	-11.34%	-11.18%	-7.58%	-6.28%	-2.31%	1.60%	3.53%	4.44%	5.57%	6.01%

Table J.3 Projected Distributional Impact of Recommended NI Formula Option 1 (Retaining Rurality) Versus Option 2 (Neutralising Rurality)

Base: Combined Indices of Recommended NI Revised Global Sum Formula (Retaining Rurality)
Option: Combined Indices of Recommended NI Revised Global Sum Formula (Neutralising Rurality)
Source data: 2006/07 Quarter 3 payments data from NHAIS "Exeter" System

	Average Index Option 1	Average Index Option 2	Average % Change	Percentiles									
				Min	0.50%	5%	10%	25%	50%	75%	90%	95%	99.50%
All Practices	**1.012**	**1.010**	**-0.21%**	**-10.11%**	**-9.68%**	**-6.25%**	**-5.37%**	**-2.97%**	**-0.14%**	**2.84%**	**4.26%**	**4.75%**	**5.55%**
Practice List Size													
2,000 and under	1.0853	1.0823	-0.30%	-8.24%	-7.81%	-5.93%	-4.95%	-3.25%	-0.24%	2.45%	3.78%	4.93%	5.20%
2,001 to 5,000	1.0127	1.0070	-0.57%	-10.11%	-9.76%	-6.44%	-5.42%	-3.26%	-0.82%	2.35%	4.15%	4.55%	5.73%
5,001 to 10,000	0.9909	0.9915	0.06%	-9.68%	-8.51%	-6.04%	-5.51%	-2.40%	-0.05%	3.21%	4.35%	4.76%	5.51%
Over 10,000	0.9961	1.0078	1.18%	-3.33%	-3.32%	-3.25%	-2.83%	-0.69%	1.70%	3.53%	4.46%	4.67%	5.34%
Number of GPs in Practice													
1	1.0530	1.0473	-0.57%	-8.24%	-7.83%	-6.16%	-5.27%	-3.23%	-1.22%	2.65%	4.16%	4.83%	5.20%
2 or 3	1.0117	1.0054	-0.63%	-10.11%	-9.74%	-6.43%	-5.54%	-3.36%	-0.59%	2.28%	4.04%	4.68%	5.69%
4 or 5	0.9976	1.0007	0.31%	-6.64%	-6.61%	-5.73%	-5.22%	-2.31%	0.78%	3.10%	4.39%	4.77%	5.52%
6 or above	0.9793	0.9919	1.26%	-4.23%	-4.07%	-3.21%	-2.83%	-1.19%	2.10%	3.45%	4.42%	4.63%	5.29%
SLLI													
Lowest SLLI Quartile	0.9001	0.8992	-0.09%	-8.24%	-7.50%	-5.37%	-4.97%	-2.43%	0.12%	2.53%	4.76%	5.35%	5.52%
Quartile 2	0.9696	0.9596	-1.00%	-9.68%	-8.84%	-6.52%	-5.72%	-3.68%	-0.81%	1.93%	2.98%	3.45%	4.49%
Quartile 3	1.0288	1.0171	-1.17%	-10.11%	-9.93%	-6.38%	-5.73%	-3.09%	-1.53%	1.66%	3.28%	3.76%	4.36%
Highest SLLI Quartile	1.1591	1.1730	1.40%	-7.93%	-7.07%	-5.54%	-5.18%	-2.61%	2.57%	4.18%	4.69%	4.88%	6.11%
Rurality - Distance to Urban Centre													
Lowest urban centre Quartile	1.0967	1.1362	3.95%	-3.25%	-2.25%	0.12%	1.97%	3.08%	3.97%	4.65%	5.17%	5.46%	6.11%
Quartile 2	0.9857	0.9976	1.19%	-3.74%	-3.47%	-2.84%	-2.19%	-0.09%	1.78%	2.58%	3.44%	3.76%	4.07%
Quartile 3	0.9663	0.9392	-2.70%	-7.88%	-7.49%	-6.57%	-5.82%	-4.88%	-2.68%	-0.39%	0.26%	0.53%	0.93%
Highest urban centre Quartile	1.0004	0.9647	-3.57%	-10.11%	-9.92%	-7.45%	-6.41%	-5.31%	-3.10%	-1.80%	-0.98%	-0.30%	0.68%
Rurality - Distance to GP Practice													
Lowest GP mileage Quartile	1.0219	1.0511	2.92%	-5.34%	-5.02%	-2.84%	-0.95%	1.80%	3.80%	4.55%	5.10%	5.46%	6.08%
Quartile 2	1.0457	1.0546	0.89%	-5.74%	-5.73%	-5.26%	-4.63%	-0.90%	1.79%	3.05%	3.65%	3.88%	4.51%
Quartile 3	1.0000	0.9900	-1.00%	-5.73%	-5.65%	-5.07%	-4.58%	-2.44%	-1.29%	0.10%	2.32%	2.60%	3.10%
Highest GP mileage Quartile	0.9816	0.9421	-3.95%	-10.11%	-9.93%	-7.91%	-6.65%	-5.85%	-3.88%	-2.50%	-0.64%	-0.15%	0.81%
Patients aged > 65													
Lowest (pat > 65) Quartile	1.0250	1.0217	-0.32%	-10.11%	-9.92%	-6.32%	-5.54%	-3.85%	-0.17%	3.60%	4.65%	4.80%	6.09%
Quartile 2	1.0021	0.9948	-0.73%	-6.94%	-6.79%	-6.26%	-5.64%	-3.13%	-1.53%	2.52%	3.79%	4.58%	5.24%
Quartile 3	0.9775	0.9714	-0.61%	-9.68%	-8.51%	-6.37%	-5.27%	-3.01%	-0.41%	2.07%	3.93%	4.56%	5.52%
Highest (pat > 65) Quartile	1.0452	1.0540	0.88%	-8.24%	-7.55%	-5.16%	-4.61%	-1.54%	1.81%	2.86%	4.11%	4.52%	5.43%
New Registrations													
Lowest New Reg Quartile	1.0730	1.0817	0.87%	-7.88%	-7.50%	-6.26%	-5.55%	-3.10%	2.16%	4.15%	4.79%	5.45%	6.16%
Quartile 2	1.0044	0.9971	-0.74%	-9.69%	-9.68%	-6.42%	-5.67%	-3.38%	-1.01%	2.36%	4.07%	4.67%	5.44%
Quartile 3	0.9900	0.9864	-0.37%	-10.11%	-9.33%	-6.34%	-5.22%	-2.47%	-0.14%	2.21%	3.46%	3.87%	5.11%
Highest New Reg Quartile	0.9900	0.9857	-0.43%	-6.44%	-6.36%	-5.36%	-4.91%	-2.89%	-0.41%	2.68%	3.64%	4.35%	4.93%
Nursing/Residential Home Patients													
Lowest NRH Quartile	1.0322	1.0221	-1.00%	-10.11%	-9.93%	-7.64%	-6.34%	-4.66%	-2.01%	3.15%	4.57%	4.79%	6.13%
Quartile 2	1.0132	1.0090	-0.42%	-9.68%	-8.20%	-5.74%	-4.85%	-3.09%	-0.37%	2.60%	3.92%	4.38%	5.20%
Quartile 3	1.0100	1.0153	0.53%	-6.96%	-6.75%	-5.54%	-4.75%	-1.97%	0.92%	3.36%	4.49%	4.63%	5.45%
Highest NRH Quartile	0.9966	0.9975	0.08%	-6.64%	-6.54%	-5.54%	-5.02%	-2.46%	0.41%	2.26%	3.87%	4.81%	5.46%
Index of Multiple Deprivation													
Lowest IMD Quartile	0.9437	0.9531	0.94%	-6.64%	-6.63%	-4.99%	-3.21%	-0.49%	1.83%	2.87%	4.53%	5.33%	5.52%
Quartile 2	0.9733	0.9595	-1.38%	-8.24%	-8.08%	-6.08%	-5.43%	-3.29%	-1.53%	0.62%	2.18%	3.03%	3.97%
Quartile 3	1.0166	0.9971	-1.96%	-9.68%	-8.59%	-6.44%	-5.74%	-4.23%	-2.22%	-0.12%	3.26%	3.85%	4.37%
Highest IMD Quartile	1.1345	1.1494	1.49%	-10.11%	-9.93%	-5.94%	-5.53%	-1.76%	3.33%	4.32%	4.74%	4.91%	6.13%

APPENDIX K: NI GMS Working Group Membership

Chair

Mr John Farrell	Assistant Director of GMS Contract Branch

Eastern HSS Board Representatives

Dr S Adair	Director of Primary Care
Mr C McCloskey	Assistant Director of Finance

Northern HSS Board Representatives

Mrs J Barkley	Assistant Director (Primary Care Delivery)
Mr I Armstrong	Head of Financial Management, Family Practitioner Services

Southern HSS Board Representatives

Mr E Ritson	Director of Primary Care

Western HSS Board Representatives

Mr E Gallagher	Director of Primary Care
Mr P Brolly	Business Manager, Family Practitioner Services Unit
Mr P Ballentine	Senior Accountant

General Practice Representative

Dr E Deeny	General Practitioner, Western HSS Board

Department of Health, Social Services & Public Safety Representatives

Mrs P Murray	Statistician, Information & Analysis Directorate
Miss A Dunwoody	Statistician, Information & Analysis Directorate
Mr R Duffin	GMS Contract Branch
Mr P McAuley	GMS Contract Branch

Central Services Agency Representatives

Mr S Fitzpatrick	Statistician, Information & Research Unit, Family Practitioner Services
Miss P Power	Statistician, Information & Research Unit, Family Practitioner Services