**Acute Morbidity and Life Circumstances (MLC) Review Update**

**TAGRA(2016)02**

This paper provides an update on the progress of the Acute MLC review. At the time of the last update to TAGRA, decisions had been made on the geography, time span, age split and the methodology for identifying unmet need. Subsequently, population data at the 2011 data zones has been released by NRS, which has allowed the cost ratios, potential candidate variables and supply variables to be calculated at the 2011 data zones. As a first step, the ‘reference model’ – the current Acute needs index and supply model – was rebuilt at the new geography for validation and checking. Analysis was then carried out to select the supply model for the new Acute MLC adjustment; a decision was taken on this at the January 2016 meeting of the Subgroup. The first stage of the indicator selection process – elimination of near-duplicate variables – has also been carried out and results were presented at the meeting on 21st January 2016.

1. **Supply variables**

The current Acute MLC model uses IPACX (inpatient access, taking into account distance to the facility), OPACX (outpatient access taking into account distance to the facility) and health board dummy variables in the supply model.

Following analysis and explanations of the supply variables, and evaluating the options against TAGRA’s core criteria, the Subgroup decided to retain the existing supply variables, but to use only one of IPACX and OPACX in each regression since these variables are highly collinear. IPACX will be used for all inpatient diagnostic groups and OPACX will be used for Outpatients.

When developing the reference model it was noted that datazones containing prisons were outliers and so dummy variables are being developed to adjust for this factor.

1. **Indicator selection**

The first stage of analysis to select the indicator variables has been carried out. This involved first removing variables where a high number of data zones had zero counts (see Appendix 1), and then eliminating ‘near-duplicates’ from the variable list, retaining the variants that correlate best with the cost ratios. (‘Near-duplicates’ are highly correlated variables that are conceptually equivalent – for example, all-cause SMR <75 and all-cause SMR < 65 would be considered near-duplicates and we would not want to include both in the final model.)

The retained variables, following the above analysis, are:

* All cause SMR <75
* Cancer SMR <75
* Heart SMR <75
* Other SMR <70
* Limiting Long term Illness
* General health – bad or very bad
* Living alone ≥70
* Living alone ≥90
* Unpaid care ≥ 20 hours
* Education – level 2 and below
* DNA counts – ratio to population
* Low birth weight births
* Patients receiving Dementia prescriptions
* High resource individuals
* Long-term sick and not seeking work

At least one ethnicity variable will also be included as, despite large numbers of zeros for specific ethnic group populations and questions around the validity of combining different groups, the Subgroup still felt some measure of ethnicity should be included at this stage.

1. **Diagnostic groups**

The current diagnostic groups (Cancer, Heart, Respiratory, Digestive, Injury, Other and Outpatients) have been reviewed, following clinical advice. The subgroup decided to keep the current grouping plus examine a ‘Whole Acute’ option which would combine all seven groups together. Analysis will be carried out for both methods and a decision made by examining the results and assessing against the core criteria.

There has been some discussion around whether the ‘Outpatients’ grouping could be taken out and the activity split into the remaining six diagnostic groups. Due to the lack of diagnostic information in Outpatient data, this would have to be done another way. Exploratory analysis is being carried out to see if mapping Outpatient activity to diagnostic groups using specialty is feasible.

1. **Next steps**

The next stages of the analysis are to perform both stepwise regressions and factor analysis. This will result in a ‘restricted set’ of variables which are significant predictors of need. Examination of the coefficients of the variables in this restricted set will then be used to select the strongest final variables for the needs index. After this, work to investigate unmet need will be undertaken and the final report will be delivered to TAGRA as planned in August 2016.

**Appendix 1 - Numbers of data zones with zero counts for each variable**

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| **Variable** | **Zeros** |
| Low birth weight births | 2,042 |
| Death rate 0-74 all causes | 8 |
| Death rate 0-74 Cancer | 118 |
| Death rate 0-74 CHD | 1,443 |
| Death rate 0-74 Stroke | 4,874 |
| All cause SMR 0-64 | 74 |
| All cause SMR 0-69 | 21 |
| All cause SMR 0-74 | 8 |
| Cancer SMR 0-64 | 711 |
| Cancer SMR 0-69 | 277 |
| Cancer SMR 0-74 | 118 |
| Heart Disease SMR 0-64 | 1,940 |
| Heart Disease SMR 0-69 | 1,139 |
| Heart Disease SMR 0-74 | 624 |
| Respiratory SMR 0-64 | 4,576 |
| Respiratory SMR 0-69 | 3,508 |
| Respiratory SMR 0-74 | 2,416 |
| Digestive System SMR 0-64 | 3,966 |
| Digestive System SMR 0-69 | 3,385 |
| Digestive System SMR 0-74 | 2,924 |
| External Causes SMR 0-64  | 2,946 |
| External Causes SMR 0-69 | 2,774 |
| External Causes SMR 0-74 | 2,614 |
| Other SMR 0-64 | 2,597 |
| Other SMR 0-69 | 2,076 |
| Other SMR 0-74 | 1,510 |
| High Resource Individual counts | 0 |
| Patients receiving Diabetes prescriptions | 5,426 |
| Patients receiving Dementia prescriptions | 727 |
| Patients receiving Respiratory prescriptions | 5,386 |
| Long-term illness  | 0 |
| Mental health condition  | 0 |
| Limiting long-term illness – limited a lot | 0 |
| Limiting long-term illness – limited a little or a lot | 0 |
| Long-term sick and not seeking work  | 7 |
| General health – very bad | 88 |
| General health – bad or very bad | 2 |
| Older people living alone – 65 and over | 14 |
| Older people living alone – 70 and over | 32 |
| Older people living alone – 75 and over | 87 |
| Older people living alone – 80 and over | 185 |
| Older people living alone – 85 and over | 491 |
| Older people living alone – 90 and over | 1,854 |
| Unpaid care – 1 hour or more | 0 |
| Unpaid care – 20 hours or more | 0 |
| Unpaid care – 35 hours or more | 2 |
| Unpaid care – 50 hours or more | 8 |
| Education level – no qualifications | 0 |
| Education level – level 1 and below | 0 |
| Education level – level 2 and below | 0 |
| Job seekers  | 0 |
| Did Not Attend counts – as a fraction of all OP appointments | 0 |
| Did Not Attend counts – ratio to data zone population | 0 |
| Ethnic group populations (Gypsy/Traveller) | 5,097 |
| Ethnic group populations (Pakistani) | 2,845 |