Recommendations by the Risk Equalisation Technical Advisory Panel

to the Council for Medical Schemes

Proposed Methodology for the Risk Equalisation Fund Contribution Table 2007 [Base 2005, Use 2007]

RETAP Recommendations Report No. 8

Adopted at RETAP Meeting on 20 April 2006

Risk Equalisation Technical Advisory Panel (RETAP)

Following the approval of the Social Health Insurance (SHI) policy by the National Department of Health, the Minister of Health appointed a Ministerial Task Team (MTT) on Social Health Insurance to support the implementation of the SHI system in South Africa over the next five years. The MTT is made up of officials from the Department of Health, the Department of Social Development and the Council for Medical Schemes. In January 2005 Cabinet approved the shadow implementation of the Risk Equalisation Fund (REF) and placed the responsibility for implementation with the Council for Medical Schemes. Dr Boshoff Steenekamp joined the Council for Medical Schemes in May 2005 to head the Risk Equalisation Fund. Cabinet approved the implementation of REF in July 2005.

The Risk Equalisation Technical Advisory Panel (RETAP) was established on 20 October 2004 as a consultative group used to assist in the development of technical requirements for implementation of the REF. RETAP's role flows from some of the key recommendations made by the original Formula Consultative Task Team (FCTT). In particular, the panel must focus its attention on the practical requirements for the implementation of the REF formula. Its recommendations should enable an action plan to be developed for implementing the formula, taking into account all the practical and technical issues that will arise in the implementation phase.

Comments or suggestions on this document should be sent to:

Professor Heather McLeod
Chair of the Risk Equalisation Technical Advisory Panel
Tel: 028 572-1933
Fax: 086 671-9440
E-mail: hmcleod@iafrica.com

The members of RETAP are currently: Prof. Heather McLeod, Brenda Khunoane, Alex van den Heever, Robert Moeti, Boshoff Steenekamp, Mondi Govuzela, Dr. Izak Fourie, Pieter Grobler, Brett Mill, Susan Mynhardt, George Marx, Dr. Brian Ruff, Malcolm Brown, Paul la Cock, Dr. Geetesh Solanki, Dr. Jonny Broomberg, Dr. Andrew Good, Dr. Bettina Taylor, Dr. Rajesh Patel and Dr. Mark Ferreira. Other stakeholders are welcome at meetings where they can contribute specific expertise.

Table of Contents

1. Introduction

1.1 Purpose of the Report

The Formula Consultative Task Team prepared the REF Contribution Table 2004. Since then, the Risk Equalisation Technical Advisory Panel (RETAP) have published the methodology to be used and prepared the REF Contribution Tables for 2005 and 2006. This document sets out the recommended methodology for the REF Contribution Table to apply in calendar 2007 (REFCT 2007).

The report was prepared by Heather McLeod, in discussion with Pieter Grobler and Brett Mill, who were responsible for the pricing for 2005 and 2006. Two new members, Paul la Cock and Dr Geetesh Solanki, will be joining the pricing team for the REFCT 2007. The document was discussed, amended and adopted by a full meeting of RETAP on 20 April 2005.

This report is a formal recommendation from RETAP to the Council for Medical Schemes which is responsible for the implementation of the REF. The Council for Medical Schemes will need to satisfy itself as to the appropriateness of the recommendations and to formalise a decision on the planned methodology for the REF Contribution Table 2007.

2. Guiding Principles and Base Year

2.1 Definitions and Guiding Principles

The guiding principles developed in 2003 and attached in Appendix A have served well to date and no amendments are needed at this stage.

2.2 Choice of Base Year

It is essential to conduct a full review of the REF formula prior to the introduction of the REF Contribution Table for 2007. Accordingly, a full study using data from four administrators will be performed in 2006 using 2005 data. The table will thus be known as the REF Contribution Table [Base 2005, Use 2007]. The cycle for the preparation of the REF Contribution Table for 2007 is illustrated below.

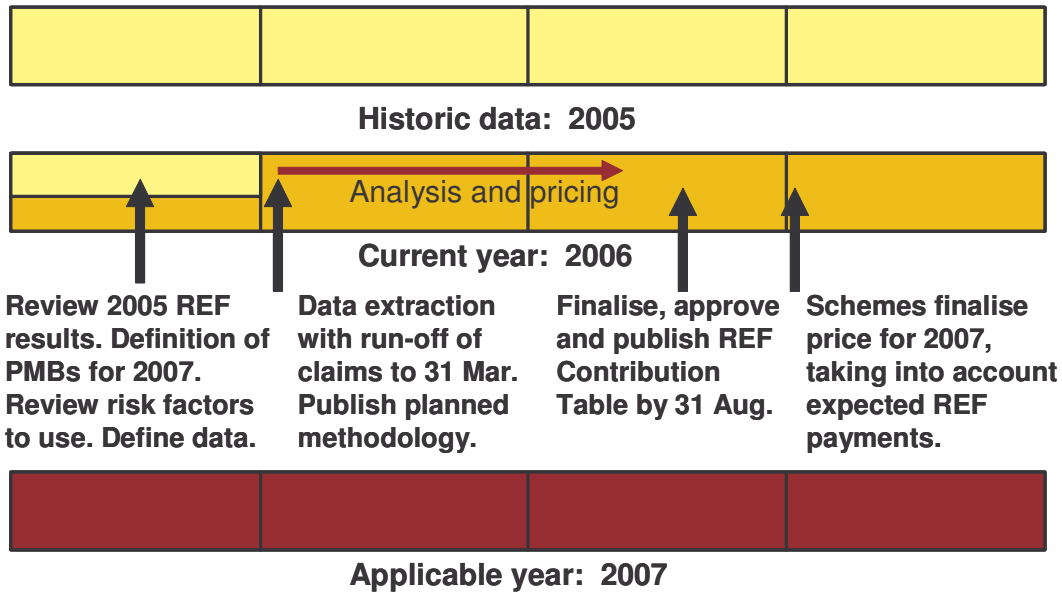

Figure 1: Cycle for Preparation of REF Contribution Table [Base 2005, Use 2007]

It is intended to use data from four administrators for the REF Study 2005:

- Discovery Health (Pty) Ltd
- Medscheme (Pty) Ltd
- Old Mutual Healthcare (Pty) Ltd
- Metropolitan Health Group (Pty) Ltd.

These administrators provide services for some 4.147 million lives or 65.3% of the medical scheme beneficiaries as at September 2005. The proportion of beneficiaries covered by these administrators and the age profile of these beneficiaries is illustrated below.

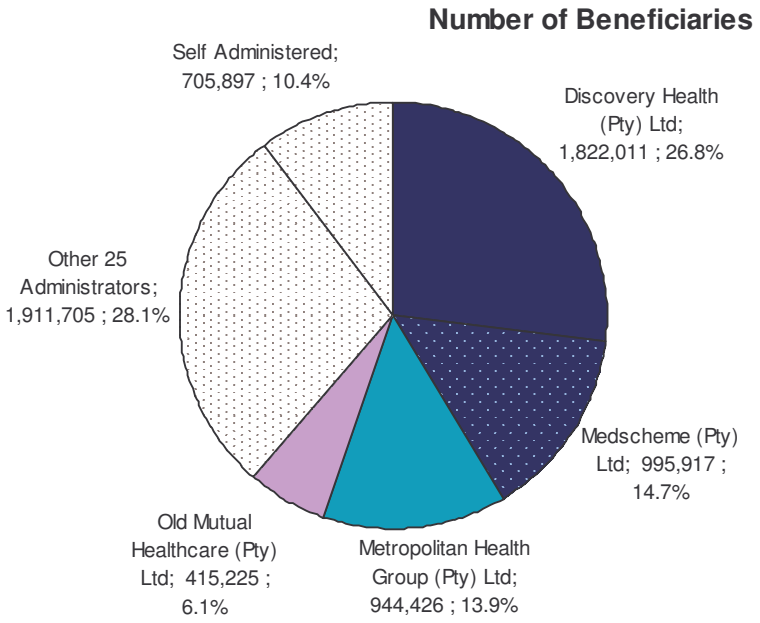

Figure 2: Proportion of Industry for REF Study using 2005 Data (September 2005 beneficiary numbers)

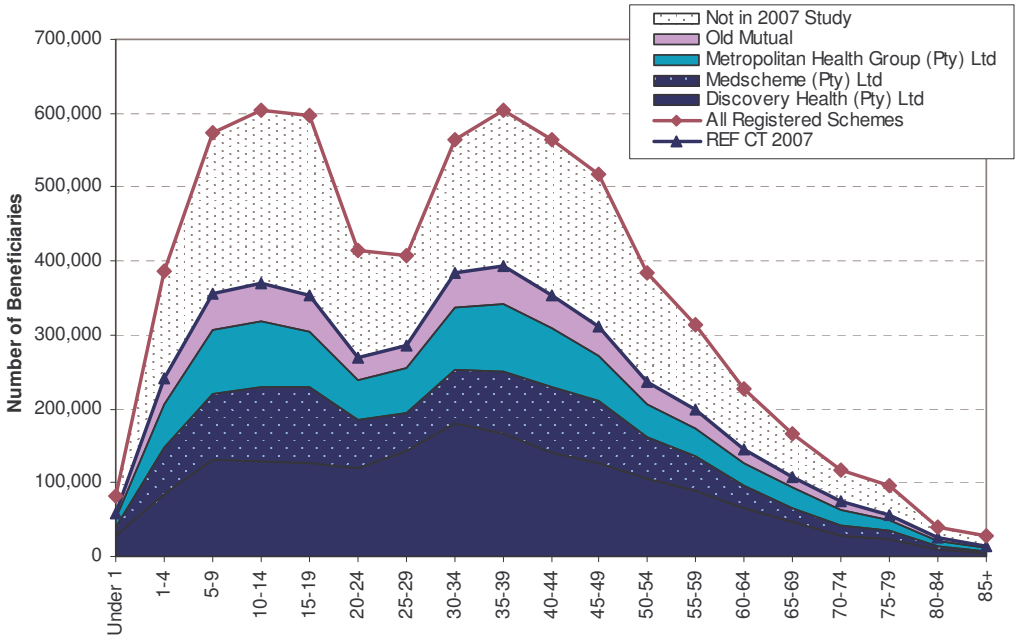

Figure 3: Age Profile for REF Study using 2005 Data (March 2005)

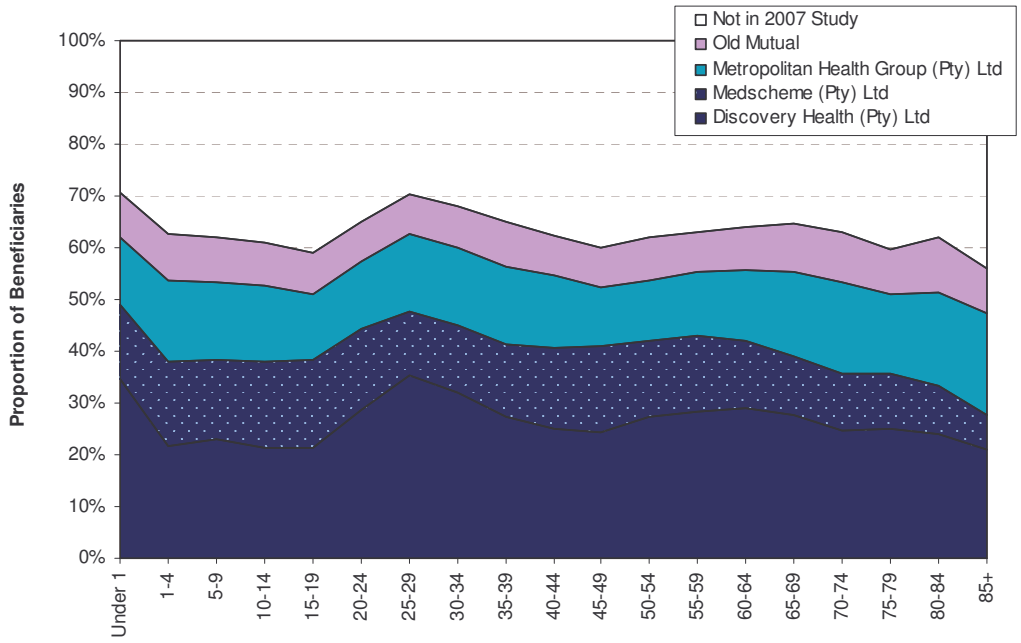

Figure 4: Proportion of Age Profile for REF Study using 2005 Data (March 2005)

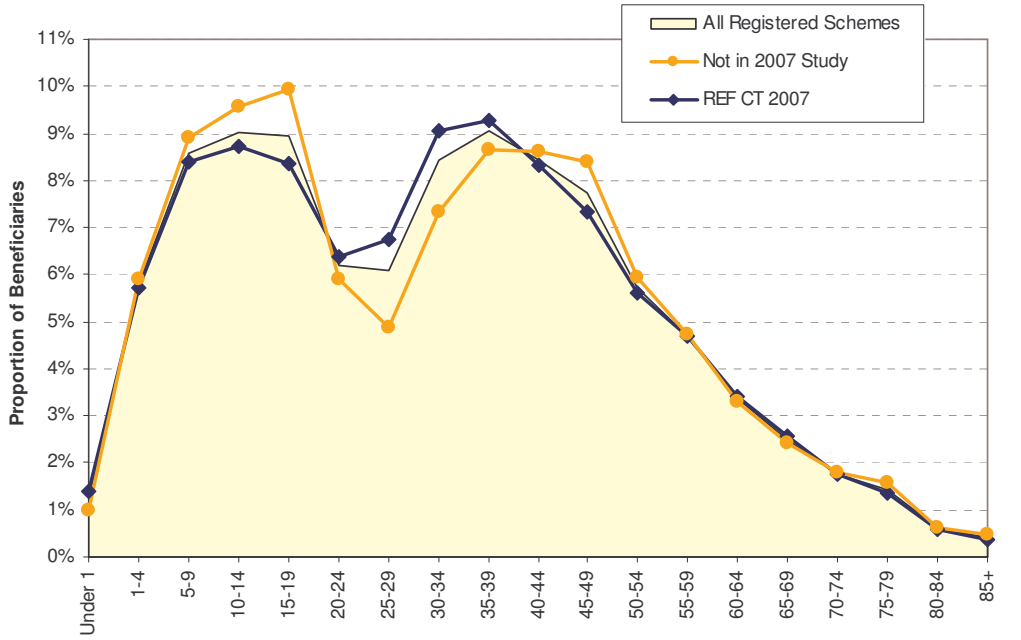

Figure 5: Standardised Age Profile for those in and out of REF Study (March 2005)

While the schemes not in the REF Study 2005 have more children and fewer young adults, the REF Study schemes have reasonable coverage at all age groups. The coverage of the study at the oldest age groups has been substantially improved by including data from MHG. The instructions for the data to be extracted are given in Appendix B.

3. Package to be Equalised and Risk Factors

3.1 Amendments to PMBs in Regulation

No amendments to PMBs to apply in 2007 have been legislated by 11 April 2006. The work on a proposed Basic Benefit package has not proceeded to a stage where any modifications need to be made to the REF common package.

Circular 13 of 2006 was unexpectedly issued by the Council for Medical Schemes on 10 March 2006. It announces Council's intention to embark on reviewing the therapeutic algorithms of the following nine diseases:

1. Bipolar Mood Disorder
2. Chronic Renal disease
3. COPD
4. Epilepsy
5. Glaucoma
6. Hyperlipidaemia
7. Hypertension
8. Multiple Sclerosis
9. Rheumatoid Arthritis

The problem from the perspective of REF is that comments are only due to be received by Friday 28 April 2006. There has been no clarity as to when the revisions will be decided but they are intended to apply for 2007. The timing of this change complicates the work on the REF Contribution Table for 2007. It had previously been discussed that REF could only incorporate changes that were notified by 31 March 2006. It will thus not be possible to incorporate the changes to the therapeutic algorithms directly in the data to be extracted in April for the REF Study 2005.

The consequence of this late change in CDL algorithms (after 20 April but before 1 June) is that we will have to manually amend the pricing for REF for 2007 for each of the nine diseases that are affected. If Council performs the correct pricing exercises under "the impact on medical scheme viability and its affordability to members", then we can hopefully take those figures into account in the REF pricing. If the pricing exercise is not fully done by Council, then the REF pricing group will need to add further studies to its agenda, taking perhaps an additional 8 to 10 days for the pricing. The consequences of a very late change in CDL algorithms (finalised after 1 June) is that we cannot take the changes into account for 2007, but only for 2008.

RETAP strongly recommends to the Council for Medical Schemes that it is critical to synchronise the changes in the definition of PMBs to allow for the REF pricing cycle as well as the pricing cycle of schemes. All PMB changes for a calendar year should be finalised by 31 March of the previous year, which is the time when the REF methodology for the next calendar year is required to be finalised.

3.2 Impact of Change in Coding of PMB-DTPs

We have attempted to confirm that there are no immediate changes in the pipeline on the PMB-DTPs and to clarify when the next interpretation of the PMB-DTPs is to be published. However we have not received any feedback from the Council for Medical Schemes.

We will therefore use the definition of the PMB-DTPs published by the Council for Medical Schemes as “Final PMB 5 Character 2005.xls” published on the web-site in early October 2005.

RETAP again strongly recommends to the Council for Medical Schemes that it is critical to synchronise the changes in the definition of PMBs with the REF pricing cycle. All PMB definitions for a calendar year should be finalised by 31 March of the previous year.

3.3 Risk Factors

The question of the inclusion of gender as a risk factor will be investigated during this pricing study, known as the REF Study 2005. However, gender can not be brought into the REFCT 2007 as it would have to have been notified to schemes as a risk factor in this document. If the REF Study 2005 results in a recommendation to include gender as a future risk factor, the earliest it could be incorporated would be for the REFCT 2008.

There have been suggestions made during early 2006 that other risk factors be considered for incorporation by the Risk Equalisation Fund:

- Metabolic storage diseases – including the rare lysosomal storage disorders such as Gaucher Disease, Hurler’s Syndrome (including Hurler Schie and Schie (MPS I)), Hunter’s Syndrome (MPS II), Maroteaux Lamy Syndrome (MPS VI), Pompe’s Disease and Fabry Disease.
- Neo-nates
- Oncology.

Work is being undertaken on these areas and will be the subject of a separate report to RETAP and the Council for Medical Schemes. However, given the timing discussed above on gender, it is not feasible for any of these to become risk factors for the REF Contribution Table 2007. The earliest feasible date for the incorporation of any of these additional risk factors would be after the next full study of the formula. The date of the next full study has not yet been set but could be undertaken in 2007 for the 2008 table or at the latest in 2009 for the 2010 table. It would be expected that a full study be conducted at least every three years.

Therefore no change will be made to the risk factors used for the REF Contribution Table 2007 [Base 2005, Use 2007]:

- Age last birthday on 1 January, summarised into age bands Under 1, 1-4, 5-9, 10-14… 75-79, 80-84, 85+.;
- The 25 PMB–CDL conditions. Where a beneficiary has more than one CDL condition, the scheme may choose the most expensive of the conditions for the placement of the beneficiary in the REF Grid Count.
- HIV/Aids provided the beneficiary is receiving or has received anti-retroviral therapy according to the PMB definition;
- A modifier for maternity, delivery of a single/multiple foetus either stillborn or alive following a pregnancy of at least 24 weeks duration;
- A modifier for the number of multiple CDL conditions. Allowance is made for 2, 3, and 4+ simultaneous CDL conditions.

3.4 Rules for Determining REF Grids

The Entry and Verification criteria to be used for the extract of data will be those defined as a result of the RETAP meeting on 20 April 2006. Please see the separate draft document entitled “Guidelines for the Identification of Beneficiaries with REF Risk Factors in Accordance with the REF Entry and Verification Criteria, Version 2.A3” issued 10 March 2005 and any updates issued by 17 April 2005.

It is important to note that the Entry and Verification criteria now use a method of chronic hierarchical conditions to arrive at legitimate Count values. The following rules for combinations of diseases will need to be adhered to for each patient:

- Only one of the following chronic respiratory diseases: Chronic Obstructive Pulmonary Disease, Asthma and Bronchiectasis.
- Only one of the following cardiovascular diseases: Cardiomyopathy and Cardiac Failure, Coronary Artery Disease, Dysrhythmias; and Hypertension.
- Only one of Hypertension or Chronic Renal Failure may be assigned.

- Only one of the following gastro-intestinal conditions: Crohn's disease and Ulcerative Colitis.
- Diabetes Mellitus Type 1 and Type 2 cannot co-occur.
- Only one of Bipolar Mood Disorder and Schizophrenia may be assigned to the same patient (expected to be added on 17 April).

3.5 Impact of LIMS Regulation

The final report from the LIMS process, "Consultative Investigation into Low Income Medical Schemes", was released on 7 April 2006. The report recommends that the Medical Schemes Act should be modified to require that LIMS schemes and LIMS options offer a defined minimum benefit package, the LIMS minimum package (LMP). The report contains the following recommendations with respect to LIMS schemes and REF:

- A separate REF system should be established for LIMS schemes as soon as possible. Ideally, this should be established by the time of launch of LIMS schemes, but in any event, by no later than 6 months after launch of the LIMS schemes.

- Risk equalisation parameters should be as simple as possible. Initial recommendations for this would be the use of age, gender and chronic/non chronic status only.

- The LIMS REF system should be governed and operated on the same principles within the same infrastructure as the main REF.

The Department of Health still needs to consider and evaluate the LIMS proposals. If accepted, there will need to be enabling legislation for the LMP and LIMS schemes. The operation of any LIMS options and schemes seems unlikely before the beginning of 2008.

At this stage, no work has yet been started on a separate LIMS REF pool. The timing of the introduction of LIMS is critical for the main REF pool calculations because the impact of a change in the age and disease profile of beneficiaries will need to be estimated. It is recommended that no allowance for LIMS be taken into account for the REF Contribution Table 2007.

4. Adjustments in the REF Contribution Table

4.1 Adjustment for Target Population

Note that the target population age profile used does not affect the REF Contribution Table itself, but does have a substantial impact on the Industry REF Community Rate derived from the table and hence on the payments to or from the REF.

As at April 2006 the full SHI framework which incorporates income-based cross-subsidies has not yet been approved by Cabinet, although it is policy of the Department of Health. In section 3.5 the impact of LIMS legislation was discussed. Accordingly it seems unlikely that there will be any substantial change in the membership of medical schemes during 2006. RETAP therefore recommends that no adjustment be made for any change in target population due to the impact of SHI or LIMS.

The target population profile will be drawn from the most reliable data received in the most recent REF Grids submitted, which will be in respect of Q1 2006. The extent to which the Entry and Verification criteria have been applied will be critical in deciding how much weight to give to the REF Grids as compared to data from the REF Study 2005. In all likelihood, the age profile will be used from the REF Grids but the disease profile will be that drawn from the REF Study.

It is recommended that the sensitivity of the table be tested for an increase or decrease in the number of people identified with CDL diseases.

4.2 Adjustment for Demographic Profile of Base Data

As there is not expected to be a major influx of new members who were previously not in medical schemes, no adjustment is envisaged.

4.3 Adjustment from Raw to Full PMB Cost

The data to be extracted is given in Appendix B and this forms the so-called raw data. The raw data is then adjusted to reach the full price of PMBs, based on the advice of the members of the pricing panel.

4.4 Adjustment for Inflation

An estimate will need to be developed for the expected inflation between mid-2005 and mid-2006, using experience from the four administrators. The estimated inflation for the period mid-2006 to mid-2007 will be developed by those responsible for scheme pricing for 2007 at the four administrators.

4.5 Adjustment for Efficiency

The REF seeks to equalise the "most reasonably achievable efficient cost" of PMBs. The FCTT Report recommended the use of the concept of levels of efficiency as developed from the Milliman USA model:

- **Loosely managed**: the standard level of managed care interventions in general use by SA schemes i.e. includes pre-authorisation, case management, drug-utilisation review but almost no risk-sharing with providers.

- **Moderately managed**: an intermediate level of managed care that involves some risk-sharing. Examples would be per diem or per case rates on hospitalisation. In SA there has been substantial movement towards risk-sharing for some primary care options but less movement in hospital contracting. Although some options may be approaching this level, it is unlikely that many whole schemes would have reached this level yet.

- **Well managed**: a full implementation of managed care with extensive risk-sharing with providers or complete risk-taking by providers as in staff model Health Maintenance Organisations. The best examples in SA are the mine healthcare systems like Impala Platinum and the system that used to be operated by Igolide.

The efficiency target for the REF Contribution Table was recommended to be set at "Moderately Managed". This is achievable by schemes in the medium-term whereas only some schemes will proceed down the route to staff model type structures.

Much of the data that is extracted for the REF Study 2005 will still be fee-for-service. A decision has been taken to extract data separately for each option and then to categorise the options into types. In particular, options where there is a move towards alternative reimbursement structures need to be separately identified before the adjustment for efficiency is made.

5. Policy Interventions, Specific Disease Costs

5.1 Changed Treatment Algorithms for Nine Diseases

This issue was discussed in section 3.1. Until details of the changes in the algorithms are made public, it will not be possible to determine the work needed to amend the price of these diseases, or whether the effect should be delayed until the 2008 table.

5.2 Maternity Modifier Protocols and Costs

A revised costing of maternity was done from first principles using the WHO guidelines and NHRPL prices for 2006. This will need to be updated to envisaged NHRPL prices for 2007.

It is envisaged that the current weighting 50% for normal vaginal deliveries (NVDs) to 50% doe caesarean sections (c/s) will continue for the REF Contribution Table 2007. Once money is changing hands under REF it is planned to change this proportion by 5% each year towards a greater weighting for NVDs. This will need to be considered each year in the light of stakeholder comment and prevailing practice with respect to deliveries for HIV+ women.

5.3 Progression of the HIV/AIDS Epidemic

Leigh Johnson of the Centre for Actuarial Research (CARe) was approached to provide estimates of the numbers of people on HAART each year in the private sector. He provided estimates for each year from 2002 to 2010. He continues to work on refining these estimates. If new results are available, they will be used.

These projections were blended into the actual numbers of people being treated as disclosed by schemes in their REF Grid submissions in 2005, for use in the REFCT 2006. The extent to which the expected HIV counts have increased will impact the choice of estimate to apply for the 2007 year.

6. Publication of the REF Contribution Table

6.1 Format and Layout

The format and layout used for the REFCT 2005 and 2006 will be used for the REF Contribution Table 2007.

6.2 Staged Implementation

It is possible that there may be a staged implementation of the disease risk factors in order to ensure that all systems have been fully tested and data fully verified. Any decision in this regard will be made by the Minister of Health in August 2006.

The REF Contribution Table for 2007 can be prepared in the full format and four additional formats:

- Table A: Age only
- Table B: Age and MAT only.
- Table C: Age, MAT and all diseases at 25% weighting.
- Table D: Age, MAT and all diseases at 50% weighting.
- Table E: Full format

It is possible that during the pricing process other formats (for example, some diseases at 50% and others in full) might be requested. The tables to be used and the dates at which they will be applicable will be notified when the final REF Contribution Table is released on 31 July 2006.

RETAP recommend that the Council for Medical Schemes make a recommendation to the Minister to either implement Table B (age and MAT only) or Table E (full format) in August 2006. If Table B is to apply, it should apply for the full calendar year 2007.

Appendix A: Definitions and Guiding Principles

This section was originally contained in the Formula Consultative Task Team report of 2004 and was updated by RETAP in February 2005 to ensure consistency with terminology adopted in the FCTT Report and the International Review Panel Report.

A1. Objectives

The Department of Health discussion document was used as the main source for understanding policy in this regard.[1]

> The primary objective of the Risk Equalisation Fund in South Africa is to protect the environment of open enrolment and community rating. The purpose is to prevent competition between medical schemes from occurring on the basis of risk selection. In doing so it will encourage competition between medical schemes on the basis of cost and quality of healthcare delivery.

Thus the FCTT developed the understanding that the REF will attempt to equalise the predictable financial consequences that are introduced to the medical schemes environment in view of the requirements of community rating, open enrolment and Prescribed Minimum Benefits (PMBs).

A2. Definition of Risk

In the context of the Risk Equalisation Fund, **risk** is defined as:

> The expected and predictable significant deviation from the theoretical national community-rated price for groups of beneficiaries with a measurable set of risk factors.

The national community-rated price is the reasonably efficient achievable price for the common set of benefits which is the PMBs. The concept of "reasonably efficient achievable price" is explored more fully in the Guiding Principles below.

---

[1] Department of Health (2002), Inquiry Into the Various Social Security Aspects of the South African Health System. Policy Options for the Future., 14 May 2002.

A3. Definition of Residual Risk

In the context of the Risk Equalisation Fund, **residual risk** is defined as:

> The difference between actual cost of delivery of the common set of benefits in a particular scheme and the risk equalised contributions received by the scheme.

Residual risk occurs as a result of risk factors not incorporated in the Risk Equalisation Fund, benefits and claims in excess of core package and performance of the scheme that varies from the reasonably efficient achievable price.

Hence the REF does not alleviate:

- any risks associated with benefits in excess of the PMB package;
- any demographic profile risks other than reflected in the risk factors taken into account in the REF Contribution Table. This is principally the risk reflected by risk factors taken into account in the conceivably most sophisticated individual medical scheme's risk rated internal contribution table that are not in the REF Contribution Table;
- risks associated with (relative) cost and other efficiencies of health care delivery to the individual scheme's members;
- risks of actual claims experience differing from expected costs of claims according to the scheme's risk table, e.g. due to cost inflation, over-utilisation, over-servicing, fraud, poorer health outcomes, unexpected epidemics, small risk pools, pricing error, etc. and
- other risks such as administration expenses overrun, poor investment performance and losses on reinsurance.

It is important for stakeholders to understand the limits of what the Risk Equalisation Fund is designed to achieve. The REF deals primarily with age risk and health risk. Trustees of medical schemes and the Registrar's Office should not reduce their vigilance with regard to the solvency requirements for medical schemes as these deal with risks that are not equalised by the REF.

A4. Guiding Principles for the REF Formula

Guiding Principles for the Risk Equalisation Fund Formula	
Characteristic	**Explanation**
Equalisation of risk profiles	The REF formula should eliminate incentives for medical schemes to select preferred risks by ensuring that each medical scheme bears a risk profile equivalent to the risk profile of all medical scheme beneficiaries.
Non-equalisation of actual costs	The REF formula should seek to equalise payments based on the most reasonably achievable efficient cost for an agreed set of benefits. Schemes will then compete on the basis of the actual cost of delivery of those benefits.
Impartial	The REF formula should be perceived to be impartial between medical schemes and should not result in any medical scheme having to share profits that it has made as a result of its own efficiencies and cost controls.
Cost Containment	The REF formula should contain positive incentives for medical schemes to maximize efficiency and to control the costs of healthcare delivery.
Proportion of risk to be equalised	The benchmark for risk to be equalised will be the Prescribed Minimum Benefit package, delivered in a cost-effective manner which may include the use of specific network settings.
Non-equalisation of benefit levels	The REF formula should not compensate medical schemes for more expensive benefit options which are driven by trustee or member choices.
Non-equalisation of variability in experience	The REF formula does not seek to equalise the variability in actual experience of medical schemes. This will be a function of the size of the medical scheme and the active management of beneficiaries and claims.
Practicality	The REF formula should be understandable and practical to operate.
Dynamic	The REF formula needs to be dynamic to deal with such changing influences on health care costs such as inflation, medical technology, managed care developments and changing regulation.

On-going validity	The REF formula needs to be tested rigorously at least every three years but should be reviewed each year for at least the first three years of operation.
Encourage competition and new entrants	The REF formula should encourage competition between medical schemes and not prohibit the introduction of new medical schemes.
Maintain cross subsidies	The REF formula should not discourage young and healthy beneficiaries from joining or remaining in medical schemes before the introduction of mandatory membership.
Equity	The REF should be consistent and support the National Department of Health's equity goals

A5. Guiding Principles for the Choice of Risk Factors

Guiding Principles for the Choice of Risk Factors in the Formula	
Characteristic	**Explanation**
Validity	The risk factors should predict the need for medical care and define a system of adjustment in which the cells are relatively homogenous.
Reliability	The risk factors should be measured without measurement errors.
Availability	The risk factors should preferably be data items that are already collected by medical schemes or that are readily available in the industry.
Feasibility	Obtaining the risk factors for all beneficiaries should be administratively feasible without undue expenditure of time or money.
Measurable and Auditable	The risk factors need to measurable, objective, repeatable and auditable.
Invulnerability to Manipulation	The risk factors should not be subject to manipulation by medical schemes, managed care organisations, administrators, providers, intermediaries or the beneficiaries.

No Perverse Incentives	The risk factors should not provide incentives for inefficiency or low quality care.
Legislative Consistency	The use of the risk factors needs to be consistent with provisions in the Medical Schemes Act, the National Health Act and the Constitution of South Africa.
Privacy	The risk factors should not conflict with the right to privacy of the beneficiary and healthcare provider.

A6. Guiding Principles for the Operation of the REF

Guiding Principles for the Operation of the Risk Equalisation Fund	
Characteristic	**Explanation**
Transparent	The REF should be clear and transparent in its operation to the medical schemes industry.
Predictability	The REF should produce results that are as predictable as possible, in order to allow medical schemes to price their options appropriately.
Prospective vs. Retrospective Calculation	Given the highly competitive nature of open medical schemes in South Africa and the need to publish contribution tables in advance, the REF needs to adopt a predominantly prospective calculation approach.
Prospective vs. Retrospective Payments	The timing of payments needs to take into account the potential impact on scheme cashflow and solvency, as well as the most appropriate timing for the collection of data to be used in calculating the payments.
Frequency of Calculation of Payments	The frequency of payments to and from the REF should be at least on a quarterly basis, in line with the quarterly statutory returns to the Registrar of Medical Schemes. However under the full SHI framework with an income-based cross-subsidy, schemes will need to receive amounts monthly from the REF.
Sustainability	The REF should be sustainable in its own right and not require additional funding in the long run and should remove instability in the market.

Efficiency of Operation of the REF	The cost of the operation of the REF and the mechanism for guaranteeing solvency of the REF needs to be implemented at the lowest practical level.

A7. Trade-offs and Compromises

The principles described are wide ranging and the team has attempted to produce an exhaustive list. With a large list there are many principles which may involve the taking of decisions that support one principle but violate another. The implementation of these principles involves making final choices and in making these choices the principles above provide a useful tool to understand trade-offs that are made.

However to obtain the best use of the principles and to help resolve debates around final decisions where possible trade-offs should be quantified and the consequences of trade-offs identified and debated.

Appendix B: Risk Equalisation Model Steps

The original document was prepared by Pieter Grobler and Helena Theron for the other members of the Formula Consultative Task Team in July 2003. It was published as Appendix Q of the FCTT Report, January 2004 and as Appendix C of the report on the Methodology for the REF Contribution Table 2005, released in February 2005. The document has now been updated for the study to be conducted in 2006 for the REF Contribution Table 2007.

1. Introduction

This document summarises the steps that should be followed to prepare the data required to update the REF formula for the REF Contribution Table [Base 2005, Use 2007]. The data to be extracted will be for the calendar year 2005.

Two datasets are to be extracted. The first will be based on actual cost according to the agreed definitions and is called the **"Treated Patient Dataset"** The second will represent the scenario where the test for "treated patient" is not done. This will give an indication of the potential prevalence and cost if compliance is improved and more people in future fall within the definition of "treated patient". The second set is called the **"Total Cases Dataset"**

2. Data preparation

2.1 Beneficiary File

- The data must be manipulated so that there is one record per unique beneficiary per month.
- Only members that are valid beneficiaries according to the scheme rules should be counted for a specific month. This would generally mean that a beneficiary can only be counted in a particular month if a contribution for that beneficiary was received for that particular month.
- Only members with exposure of at least one month in 2005 are stored in the final dataset.
- Use this set to create dichotomous demographic variables (age bands, gender). A dichotomous variable has a value of 1 if it is true for a beneficiary, else it has a value of 0. For any given beneficiary, there will thus be 18 age variables with a value of 0 and one age variable with a value of 1.
- The definition of age is "Age last birthday on 1 January 2005", summarised into age bands: Under 1, 1-4, 5-9, 10-14… 75-79, 80-84, 85+.
- A new-born child is to be incorporated into the age structure by taking the age of the beneficiary as on 1 January of the year of evaluation. The naming of the category as "Under 1" allows for that calculation to produce either a zero or a negative result.

2.2 Chronic disease data

- Extract data from the system that captures the chronic medicine authorizations in order to obtain a list of chronic diseases per beneficiary.
- Include only the CDL diseases as well HIV/Aids.
- Manipulate the dataset so that there is one record per beneficiary with a yes/no indicator per disease.
- Merge the disease data with the beneficiary data per beneficiary.
- The resultant set contains data of members with and without chronic diseases. For each disease a dichotomous variable is created where 1 indicates the presence of a disease and 0 the absence of a disease.

2.3 Hospital data

- Create a dataset that summarizes per hospital event, all costs related to that event. Ensure that related costs are extracted not only from risk pool data but also savings account data.
- Link hospital pre-authorization data to this dataset to obtain ICD codes applicable to the hospital event.
- Use the list of five-digit PMB ICD codes as defined by the Council for Medical Schemes in October 2005 to identify PMB hospital admissions.
- Calculate the total cost of PMB admissions per beneficiary per month, allocating the costs to the month in which the admission date to hospital falls.
- Identify hospital events with obstetric deliveries using the codes as described in the Entry Criteria and reproduced below. "Delivery" will include all the codes that indicate the delivery of a single/multiple fetus either stillborn or alive following a pregnancy of at least 24 weeks duration.

  Codes that apply to “delivery” are as follows:

ICD-10 :	Pre-term labour: O60
	All other Vaginal and c/s: O80, O81, O82 and O84
NHRPL :	2614, 2615, 2616 and 2653

- Merge this dataset with the dataset as created in 2.2. The resultant dataset will now have a 2005 PMB cost per beneficiary added for beneficiaries for every month where this cost is applicable. Beneficiaries with no PMB cost should have a value of 0.
- Create a dichotomous obstetric delivery indicator where 1 indicates that there was a hospital event where a delivery was identified and 0 indicates that an obstetric delivery was not applicable.

2.4 NAPPI data

1.1.1 No test for “treated patient” i.e. Total Cases Dataset

- Isolate all NAPPIs claimed by the beneficiaries with at least one CDL condition.
- Subset NAPPIs further by only using the list of NAPPIs as defined in the document on Entry and Verification Criteria.
- If a NAPPI that is applicable to a certain disease was claimed, but the beneficiary was not identified as having that disease then the NAPPI is excluded. .
- Merge the total CDL cost per beneficiary with the dataset as created in step 2.3.

1.1.2 Test for “treated patient” i.e. Treated Patient Dataset

- Isolate all NAPPIs claimed by the beneficiaries with at least one CDL condition.
- Subset NAPPIs further by only using the list of NAPPIs as defined in the document on Entry and Verification Criteria.
- Test these diseases for a “treated patient” against the NAPPI list and the duration rules as defined in the Verification Criteria document released by the Council for Medical Schemes (currently in draft format, to be released before end 2005 by Boshoff Steenekamp).
- Exclude diseases for beneficiaries who do not meet the “treated patient” criteria.
- If a NAPPI that is applicable to a certain disease was claimed, but the beneficiary was not identified as having that disease then the NAPPI is excluded. Also, if a member is identified with a certain disease (through the authorization of chronic medicine) but does not meet the “treated patient” criteria in the verification criteria for that disease for the specific month, then it is assumed that the beneficiary does not really have the disease and the variable for that disease for that beneficiary should be set to 0.
- Merge the total CDL cost per beneficiary with the dataset as created in step 2.3.

2.5 Associated PMB-DTP claims data

- Ensure that related costs are extracted not only from risk pool data but also savings account data.
- Isolate all claims with a valid ICD10 code.
- Subset these claims to include only those claims with an ICD10 code occurring in the CMS PMB-DTP cross walk.
- Subset further to exclude all claims that are already represented in step 2.3.
- Sum the costs to create one line per beneficiary per month.
- Merge the PMB-DTP Associated costs per beneficiary with the dataset as created in step 2.4.1 or 2.4.2.

2.6 Associated CDL claims data

- Ensure that related costs are extracted not only from risk pool data but also savings account data.
- Isolate all claims with a valid ICD10 code.
- Subset these claims to include only those claims with an ICD10 code occurring in the CDL algorithms document.
- Subset further to exclude all claims that are already represented in step 2.4.1 or 2.4.2.
- Sum the costs to create one line per beneficiary per month.
- Merge the CDL Associated costs per beneficiary with the dataset as created in step 2.5.

2.7 Summarise data

The datasets created in step 2.6 should be summarised across all unique combinations of the following fields (possible values in brackets):

- Administrator
- Option identifier
- Month (1,2,…,12)
- Age Band (1,2,3 etc.)
- Gender (M,F,U)
- A column for each of the 25 CDL diseases(0,1)
- A column for the maternity indicator (0,1)
- HIV/Aids (0,1)

The datasets must include the following values:

- Beneficiary Months
- Hospital costs
- NAPPI costs
- Associated PMB-DTP costs
- Associated PMB-CDL costs