



H e a l t h M a r k e t I n q u i r y

Promoting Healthy Competition

REPORT ON ANALYSIS OF MEDICAL SCHEMES CLAIMS DATA-
INITIAL COST ATTRIBUTION ANALYSIS

VERSION 2: 8 DECEMBER 2017

DISCLAIMER

The Competition Commission Health Market Inquiry (HMI), through an open tender, appointed Towers Watson (Pty) Ltd (WTW) to assist with the storage, warehousing and analysis of part of the data collected from stakeholders.

This report relies upon the information supplied to the HMI by various stakeholders and this report takes no account of subsequent developments after the date of the submission of that data. The HMI Panel with the assistance of WTW has exercised reasonable professional skill and care in evaluating the information and data provided by the stakeholders accurately, nevertheless WTW and its directors, officers, employees, sub-contractors and affiliates accept no responsibility and will not be held liable for any errors, omissions or misrepresentations made by stakeholders and/or any other third party, or for any resulting errors or misrepresentations in the work undertaken. The HMI has ultimate responsibility for any findings it makes regarding the subject matter of this report.

In the event of inadvertent errors or omissions in this report, or should there be unintentional misinterpretations of certain aspects of the information provided by the stakeholders, this report will be amended, as necessary, based on relevant data and information that justify an amendment.

CONTENTS

DISCLAIMERi

EXECUTIVE SUMMARY1

GLOSSARY4

INTRODUCTION5

DATA USED7

 Beneficiary Level Attribution Analyses7

 Admission (Event) Level Attribution Analyses.....7

METHODOLOGIES8

 Additional Variables Created8

 Medical Scheme Plan Groups8

 PMB Admission Indicator10

 Case Mix (Admission Type) Groups10

 Statistical Analysis Methodology.....11

 Beneficiary Model Process12

 Admission Modelling Process.....13

 Additional Methodological Considerations13

OVERALL INDUSTRY COST TRENDS.....14

 All Claims Trends14

 Out-of-hospital Claims Trends19

 In-hospital Claims Trends24

 Cost per Admission Trends32

CONCLUSION.....39

List of Tables

Table 1: All Claims Cost Trends: All Schemes (Narrow Disease Burden)	14
Table 2: All Claims Cost Trends: All Schemes (Broad Disease Burden)	16
Table 3: All Claims Cost Trends: Open Schemes (Narrow Disease Burden)	17
Table 4: All Claims Cost Trends, Open Schemes (Broad Disease Burden)	18
Table 5: All Claims Cost Trends: Restricted Schemes (Narrow Disease Burden)	18
Table 6: All Claims Cost Trends, Restricted Schemes (Broad Disease Burden)	19
Table 7: Out-of-hospital Claims Cost Trends: All Schemes (Narrow Disease Burden)	20
Table 8: Out-of-hospital Claims Cost Trends, All Schemes (Broad Disease Burden)	20
Table 9: Out-of-hospital Claims Cost Trends: Open Schemes (Narrow Disease Burden)	21
Table 10: Out-of-hospital Claims Cost Trends: Open Schemes (Broad Disease Burden)	22
Table 11: Out-of-hospital Claims Cost Trends: Restricted Schemes (Narrow Disease Burden)	22
Table 12: Out-of-hospital Claims Cost Trends: Restricted Schemes (Broad Disease Burden)	23
Table 13: In-Hospital Claims Cost Trends: All Schemes (Narrow Disease Burden)	24
Table 14: In-Hospital Claims Cost Trends: All Schemes (Broad Disease Burden)	24
Table 15: In-Hospital Claims Cost Trends: Open Schemes (Narrow Disease Burden)	25
Table 16: In-Hospital Claims Cost Trends: Open Schemes (Broad Disease Burden)	26
Table 17: In-Hospital Claims Cost Trends: Restricted Schemes (Narrow Disease Burden)	26
Table 18: In-Hospital Claims Cost Trends: Restricted Schemes (Broad Disease Burden)	27
Table 19: Hospital Admission Rate Trends: All Schemes (Narrow Disease Burden)	28
Table 20: Hospital Admission Rate Trends: All Schemes (Broad Disease Burden)	28
Table 21: Hospital Admission Rate Trends: Open Schemes (Narrow Disease Burden)	29
Table 22: Hospital Admission Rate Trends: Open Schemes (Broad Disease Burden)	30
Table 23: Hospital Admission Rate Trends: Restricted Schemes (Narrow Disease Burden)	30
Table 24: Hospital Admission Rate Trends: Restricted Schemes (Broad Disease Burden)	31
Table 25: All Admissions Cost Per Admission Trends: All Schemes (Narrow Disease Burden)	32
Table 26: All Admissions Cost Per Admission Trends: All Schemes (Broad Disease Burden)	33
Table 27: All Admissions Cost Per Admission Trends: Open Schemes (Narrow Disease Burden)	34

Table 28: All Admissions Cost Per Admission Trends: Open Schemes (Broad Disease Burden)	34
Table 29: All Admissions Cost Per Admission Trends: Restricted Schemes (Narrow Disease Burden)	35
Table 30: All Admissions Cost Per Admission Trends: Restricted Schemes (Broad Disease Burden)	35
Table 31: Surgical Admissions Cost Per Admission Trends: All Schemes (Narrow Disease Burden)	36
Table 32: Surgical Admissions Cost Per Admission Trends: All Schemes (Broad Disease Burden)	37
Table 33: Medical Admissions Cost Per Admission Trends: All Schemes (Narrow Disease Burden)	37
Table 34: Medical Admissions Cost Per Admission Trends: All Schemes (Broad Disease Burden)	38

EXECUTIVE SUMMARY

The analyses reported here attempt to identify the 'unavoidable drivers' of cost escalation in the private sector, thus isolating a residual segment of increased costs that are amenable to intervention. This document then serves as a reference point for further analyses by the HMI to investigate some of these addressable drivers of cost escalation.

Analysis of five years of medical schemes claims data does suggest that South Africa has a problem with cost escalation. The average private medical scheme spend per member increased by 9.2% per annum over the study period. After adjusting for inflation, change in the age profile of members contributed to the greatest proportion of that increase (for the factors that we have data) and was more pronounced for open medical schemes. However even after taking into account changes in member's plan type, gender, disease profile and membership movement, the unexplained (or residual) increase in spend per member was still greater than 2% per annum in real terms – once again higher for open medical schemes. To put this in context, 2% of spending amounts to around R3b in 2014 terms i.e. R330 per beneficiary per annum, or a total of R1650 per beneficiary over the five year period studied.

Little of the unexplained cost increase appears to be for out-of-hospital care – this increases by around 1% for open schemes and 0.16% for restricted schemes after inflation adjustments. In-hospital care is a far more important driver – with an unexplained increase of 3.2% per annum on average. Levels of increase were slightly higher in open vs closed schemes, (3.45% vs 2.8%). This stands in sharp contrast to flat or declining hospital-based spending in many countries, once risk factors are adjusted for. Both utilisation and unit cost increases appear to be driving cost increases. On the utilisation side we see roughly 2.2% annual increase in utilisation rates, approximately half of which can be explained. Overall utilisation rates and the unexplained proportion of these are very similar between open and closed schemes.

Somewhat surprisingly, however, given that tariffs have not increased much above CPI, there was a significant increase in the average cost per admission (~2% unexplained increase per annum). Rates of increase were very similar between open and closed schemes, but were substantially higher for surgical episodes than medical ones (2.9 vs 1.3% respectively). Based on the discrepancy between tariff increases and total cost per admission increases, we suspect that much of this increase is due to increasing intensity of care for the same condition (e.g. length of stay, ICU use, consumables use)

This document also presents a number of additional tables where a broader definition of disease profile is presented. The reason for this is explained in the “*Expenditure analysis overview of approach and general observations*” and further explicated in the “*Response to data room submissions*” and its technical annexure published with these documents. As described therein:

“It is important to find a meaningful way to estimate the health of a population: to attempt to neither over nor undercount it. The degree of sickness that is in the covered population from the data we have from schemes is obviously affected by the diagnoses (and related coding) entered into the data set by health care providers. Some have indicated that all that is required is to include age, sex and HIV as most needs for health care is related to age and sex (pregnant woman) but that HIV also needs to be taken into account as it is not age related in the same way as most other diseases. Others have said that the HMI is undercounting the degree of illness in the covered population by not including each and every diagnosis and taking it as required care. To the extent that there is a propensity to over-diagnose and over-treat particular conditions, such as marginal hypertension for example, or a propensity to code a disease as a PMB or a disease on the chronic disease list (CDL), then a very broad definition of disease profile will include these over-diagnoses or up-coding behaviours (incorrectly) as explicable and the unexplained portion of expenditure will go down. We have thus included a narrow and broad definition of disease status and provided this range in our reports.”

The main expected result using the broader definition of disease profile is that the unexplained portion decreases. For example after taking into account changes in member’s plan type, gender, broad disease profile and membership movement, the unexplained (or residual) increase in spend per member was found to be 0.67% per annum in real terms – once again higher for open medical schemes. This trend is seen throughout the report. The interpretation of this will depend on further analyses which include analyses that go beyond the claims data analyses.

The results of these analyses do not point to immediate policy solutions. They do however direct us to investigate specific areas of the private sector more deeply than others, in particular:

- In-hospital care, and the players involved in providing this,
- Adverse selection and changes in risk profile of members in the open schemes sector,
- Hospitalisation rates for open and closed scheme members, examining the role of supplier induced demand, the effectiveness of scheme managed care interventions and reimbursement policies, and regulation, such as PMBs and

- Trends in service intensity – including assessing to what extent these are quality enhancing or not.

These will be dealt with in subsequent HMI reports

GLOSSARY

CPI	Consumer Price Index – a weighted index of consumer price inflation across all goods and services purchased
HMI	Competition Commission Health Market Inquiry
ICD10	International Classification of Diseases version 10
NAPPI	National Pharmaceutical Product Interface – a unique identifier owned by MediKredit, for all pharmaceutical, surgical and healthcare consumable products in RSA to enable electronic transfer of information throughout the healthcare delivery chain. https://www.medikredit.co.za/index.php?option=com_content&view=article&id=21&Itemid=31)
PMBs	Prescribed Minimum Benefits legislation, which requires that all medical schemes must cover the costs associated with care of particular types of illness

INTRODUCTION

1. The Competition Commission's Health Market Inquiry (HMI) is an inquiry into the state, nature and form of competition within the South African private healthcare sector. The HMI was initiated as there was reason to believe that there are features of the private healthcare sector that prevent, distort or restrict competition, and in order to achieve the purposes of the Competition Act¹. The Statement of Issues, published on 1 August 2014, identified a number of potential sources of harm to competition in the South African healthcare sector. Subsequently, the HMI published a Revised Statement of Issues on 11 February 2016, which further elaborates on the HMI's areas of focus. The HMI seeks to assess whether, and (if so) to what extent, these potential sources of harm exist. The HMI will then make recommendations on how competition within the private healthcare sector can be promoted.
2. To allow the HMI to understand expenditure various data were requested from industry stakeholders.
3. The HMI, through an open tender, appointed Willis Towers Watson (WTW) to assist with the storage, warehousing and analysis of part of the data collected.
4. This report specifically deals with medical scheme claims data from the period 2010 – 2014 submitted by medical schemes and/or their administrators.
5. This report, the second in the series using the claims and related data, provides an overview of the drivers of cost escalation. The analyses provide some insight into the differences in trends between in- and out-of-hospital claims, as well as the split between cost and utilisation for in-hospital claims in particular. This report should be read in conjunction with the *"Report on analysis of medical schemes claims data – 8 December 2017"* which deals in detail with the dataset used for our analyses as well as the methodology used to build the datasets. The analyses reported here attempt to identify the 'unavoidable drivers' of cost escalation in the private sector, isolating a residual segment of increased costs that are amenable to intervention. The HMI has then sought to identify what drives this residual cost increase, and hence what policy initiatives might be necessary. These detailed analyses are covered in subsequent reports.

¹ Section 43B(1)(i) and (ii) of the Competition Act 98 of 1998. See also Section 1 of the HMI Terms of Reference.

6. This report replaces the document *“Report on analysis of claims data – Initial cost attribution analysis 1 December 2016”*

DATA USED

7. For the attribution analyses outlined in the later sections of this report, the analysis datasets which have been built by WTW for the HMI and described in the Expenditure Analysis Report No. 1 have been used. The process of building these datasets was outlined in detail in the Expenditure Analysis Report No. 1 submitted to the HMI. The datasets were built using the detailed claims and membership data which was requested by the HMI from the medical schemes and their administrators.

Beneficiary Level Attribution Analyses

8. The majority of the analyses outlined in this report use individual medical scheme beneficiaries as the base unit of the statistical analyses. These analyses therefore use the beneficiary file built by WTW for the HMI analysis as a base. This file is structured at an individual beneficiary level and contains demographic information about each beneficiary in each year analysed, summary details of their claims for that year and some other usage indicators which have been built off the claims and membership databases. Of specific interest for the attribution analyses outlined in later sections are:

- 8.1. The demographic information about each beneficiary, specifically age and gender;
- 8.2. The clinical profile and reporting status indicators, which are built using claims and utilisation data with the associated medicines and diagnoses and aim to build two different pictures of the disease burden within the industry;
- 8.3. The member movement indicator (joiner, stayer, leaver, temporary, switcher) which was built to assess how member choices impact healthcare costs; and
- 8.4. The medical scheme and medical scheme plan selected, which have been grouped using the method described in paragraphs 6.6 – 6.9 and used as analysis variables.

Admission (Event) Level Attribution Analyses

9. The beneficiary level analyses outlined above aim to assess cost and utilisation trends across the entire population analysed. The event level analyses aim to understand what has happened within treatment events, usually hospital admissions. These analyses are therefore run using each individual event as a base, and use the admission file as the data input. This file is structured with one line for each hospital admission, and contains some demographic information about the patient as well as information about the facilities and medical

practitioners treating the patient, some clinical information about the admission itself as well as cost and utilisation factors within each admission. Of specific interest for the analyses contained in this report are:

- 9.1. Again, the demographic information about the patients, specifically age and gender;
- 9.2. The clinical profile and reporting status indicators as outlined above, which are transferred from the beneficiary file;
- 9.3. The diagnoses provided and procedures performed by the treating medical practitioners, which are used to build a so-called 'case-mix' indicator; and
- 9.4. A Prescribed Minimum Benefit (PMB) diagnosis indicator, built using the claims data and the PMB diagnosis list published by the Council for Medical Schemes (CMS) and taking into account the PMB flags provided by the medical scheme administrators.

METHODOLOGIES

10. This section outlines the statistical and further specific data aggregation methodologies used to produce the cost trend and attribution analyses the results of which are presented in this report. We note that the detail of how the data summary files are produced from the raw claims data is contained in the *"Report on analysis of medical schemes claims data – descriptive statistics"* This section focuses specifically on the additional variables created from those summaries as well as the statistical modelling techniques applied to the outputs of this process.

Additional Variables Created

11. The beneficiary and admission files contain a number of variables which have been created for general analysis purposes. However, for the specific analyses outlined in this report, a number of further variables have had to be created. The methodologies to create these are outlined in this section.

Medical Scheme Plan Groups

12. A number of stakeholders have submitted to the HMI in various forums that medical scheme cost inflation is understated as a result of so called 'plan mix' changes. Specifically, medical schemes contend that there has been a systemic movement of members towards cheaper products or benefit options which offer less cover, which is making the reported contribution

and claims increases appear lower than the actual figures experienced by scheme members. In order to assess this contention, a methodology was developed to compute the impact of this plan mix factor on claims trends.

13. This required that all of the medical scheme plans offered by the schemes included in the dataset are grouped by common benefit design characteristics. This is a complex task given the proliferation of different benefit designs within the industry, but for simplicity and parsimony in the statistical models two benefit design or plan mix analysis variables were created, reflecting how expenditure is managed both in a hospital setting as well as outside of hospital. These factors were purpose built created specifically as an input into the models outlined later to assess the 'plan mix' arguments outlined above, and an application of the factors for other purposes would require similar purpose specific developments.
14. The factors were created as objectively as possible by analysing the publicly available information on each benefit plan and creating key indicators, but an element of subjectivity will always be involved in such an assignment. The out-of-hospital benefit design variable is defined by the salient 'expenditure management' characteristics of the benefit options as follows:
 - 14.1. Some options offer no or very minimal non-PMB out-of-hospital benefits (so-called hospital plans) and these have been grouped together in the 'None' category;
 - 14.2. PMB exempt schemes and benefit options (the former bargaining council schemes) are placed in their own group;
 - 14.3. Benefit options which offer out-of-hospital benefits through a network arrangement, usually involving general practitioners, are grouped as 'Network' plans
 - 14.4. Benefit options which offer a limited savings allocation and minimal other benefits are grouped as 'Savings' plans;
 - 14.5. Benefit options offering traditional block benefits with limits at a reasonably low level, are grouped as 'Traditional';
 - 14.6. Benefit options which offer extensive benefits out-of-hospital(either traditional benefit limit structures with very high limits or large savings allocations and above threshold benefits) are grouped together, since logically very few members on either type of plan will experience benefit limitation, as 'Comprehensive'; and

- 14.7. There are a group of benefit options for which no information is publicly available, and these have been placed together in the 'Unknown' group.
15. A similar logic has been followed to assign an 'in-hospital characteristics' analysis variable as follows:
- 15.1. Again, the PMB exempt benefit options (a small group) have been grouped together;
 - 15.2. Any benefit options where access to hospital care is restricted through a network (either hospitals or specialists) are grouped together as 'Network' plans;
 - 15.3. Efficiency Discount Options (EDOs) where a discounted rate is offered in exchange for the use of a network in an otherwise identical benefit option, are grouped together;
 - 15.4. Options with no networks, but which pay specialists at multiples of the scheme tariff (most commonly 200% or 300%) are grouped together; and
 - 15.5. All other benefit options (those having no networks and paying specialists at 100% of scheme tariff) form the final group.

PMB Admission Indicator

16. As outlined in the previous report, the admission file contains the total claims received with a PMB ICD10 code (as published by the CMS) on the claim line. Since claims in an admission event can come from multiple sources, any admission where more than 50% of the value of the claims is made up of PMB diagnoses has been flagged as a PMB admission. As outlined above the PMB indicator provided by the administrators has been considered, but the administrators expressed varying degrees of concern about the accuracy of the indicator within their own data and as such a consistent approach across all schemes was used.

Case Mix (Admission Type) Groups

17. As outlined in the previous report, the admissions file contains the practice type (discipline) of the treating medical practitioner as well as summary diagnosis and procedure groups for each admission generated using the Clinical Classifications Software (CCS) categorisations. These are by their very nature case mix factors, but over 20 separate medical practitioner disciplines exist, the CCS diagnosis grouping contains 64 categories and the CCS procedure grouping has 231 categories. The sheer number of combinations creates various challenges of a technical nature and can lead to statistical inaccuracies, so an 'admission type' grouping logic has been developed to summarise these combinations.

The logic is as follows:

- 17.1. At a first pass, admissions are grouped by the treating discipline, i.e. general practitioners are considered separately from specialist physicians and separately from general surgeons etc. This means that specialists are always being compared to their peers when a case-mix adjusted comparison is necessary;
- 17.2. Within each discipline the most common admission groups are identified such that the specified groups cover over 80% of admissions within that discipline. In general, for surgical disciplines these groups are defined by the procedure performed and for medical disciplines these are defined by the main diagnosis treated. Some disciplines (general practitioners, cardiology etc.) are hybrid disciplines and are grouped by both diagnosis and procedure as far as possible, subject to maintaining a reasonable number of groups.
- 17.3. These most common diagnoses and/or procedures within each discipline become admission type groups on their own, while all other admissions (usually less than 20% of each discipline's admissions) are grouped into 'XYZ Discipline – Other'.
- 17.4. This leaves 177 admission type groups which reflect (as far as reasonably possible) clinically and financially homogenous groups of admissions. We note that, as per the procedure outlined above, 83.5% of admissions by volume and 79.0% of admissions by value fall into the specific groups with the balance in the various 'Other' categories. Shifts between these groups over time can then be used to assess changes in case mix received by hospitals over time.

Statistical Analysis Methodology

18. For the purposes of assessing the contributions of various factors to the annual claims increases a generalised linear model (GLM) specification methodology is used. GL modelling is used because it allows predictions to be generated for a variety of different dependent variable types (for example claimed yes/no utilisation type variables, whole number variables such as length of stay as well as 'continuous' variables such as cost) and underlying probability distributions within the same broad framework.
19. For all of the modelling work undertaken for the HMI analysis, the model is built using 2014 data only and then the model parameter results are applied to the full dataset for all five years. This allows for the comparison and calculation of a 'risk index' on the same basis to allow for

the assessment of changes in the underlying 'risk profile' over time. A single year was chosen for the model dataset to minimise the potential distorting effects of inflation, and 2014 data was used as it appears the most complete in terms of schemes and is likely to be the most reliable (since it was the most recent year requested).

20. In order to assess the impact of factors individually, a stepwise process was used. The process involved running the models multiple times, with one variable being removed at each stage. This allows the assessment of variables individually, since the change in the risk index with the variable included less the change in the index using the remaining variables but without the variable of interest is a proxy of the individual impact of the specific variable. This means that, for example, the factor for 'Disease Profile' in the tables in the next section actually measures residual disease profile effects once age and gender movements have been accounted for, i.e. whether people of the same age and gender are healthier or sicker over time.

Beneficiary Model Process

21. When analysing healthcare data at a beneficiary level, it is usual to find a significant proportion of non-claimers i.e. members or beneficiaries who, although being on the scheme, have not claimed at all in a given year. These can distort statistical models based on cost or any other continuous variable, since these models are not designed for so called singularities (i.e. large numbers of data points with the same value). In addition, the distributions generally specified for healthcare costs (log-normal, gamma or similar shaped distributions) do not allow zero values for the variable which is being modelled.

22. For this reason, a two stage modelling process is used for the beneficiary models where the dependent variable is claims cost or a sub-component of it. Firstly the probability of claiming for each beneficiary is estimated using a binomial GLM which predicts whether an event has occurred i.e. a beneficiary has claimed in a given year. Then the cost GLM is run to generate an estimated claimed amount, conditional on the beneficiary having claimed. This cost model assumes a gamma distribution for the claimed amounts and excludes the members with zero claims.

23. The predictions from both models are then combined to produce the final prediction, or risk index for each life. These predictions can then be aggregated across whichever dimensions are necessary to produce the risk indices needed as an input to the attributions. These aggregations are then used as the input to the stepwise process outlined above.

Admission Modelling Process

24. For the admission models a two-step process is not necessary since the claim event has already happened (and hence there are practically no claims with a value of zero). Therefore the second step outlined above is used for the cost modelling, and these predictions used directly for the risk indices which are needed for the stepwise modelling process.
25. However, for some variables such as length of stay, a gamma distribution model is not appropriate since the output is a number of days rather than a continuous variable. For these models a GLM process is still used, but the distribution specified is a Poisson distribution (which increases in steps of 1). The Poisson GLM processing produces exactly the same output and can be used in the same way to create risk indices to feed into the stepwise process.

Additional Methodological Considerations

26. When calculating the figures contained in this report, the following further definitions should be taken into account:
 - 26.1. When the report refers to members or beneficiaries, it counts total members or beneficiaries on any scheme in a given year, as opposed to the average exposed membership used in financial reporting.
 - 26.2. Claim figures are calculated using fees charged as opposed to benefits paid. Thus claim estimates will include claims rejected and paid out of pocket by beneficiaries as well as those paid from medical savings accounts. We note that true out of pocket expenditure will still be understated in our estimates since claims not submitted to medical schemes and paid out of pocket will still be excluded.
 - 26.3. 'Open' and 'Restricted' schemes are defined as in the CMS annual reports.
 - 26.4. All calculated inflation figures are annualised, i.e. when an inflation figure from 2010 to 2014 is quoted as x%, it should be read as x% per year. This will be consistent throughout all of the reports produced as part of the expenditure analysis, and any exceptions will be noted accordingly.
 - 26.5. Where claims figures are summarised by an analysis variable, the definition will correspond to those used in the *"Report on analysis of medical schemes claims data – descriptive statistics"*

OVERALL INDUSTRY COST TRENDS

All Claims Trends

27. Our first analyses looked at the extent to which member and plan characteristics explained the increase in overall claims spending from 2010-2014. Table 1 and 2 shows the % increase in claims costs year on year unadjusted, the impact of adjustments, and the residual increase that remained after adjustment. We made adjustments for member age and gender, whether they suffered from a chronic disease or not (disease profile - using a narrow and broad definition), member movement in and off our study cohort (some members left and/or joined, and not all schemes provided data for every year), and plan mix – their choice of level and type of cover.

TABLE 1: ALL CLAIMS COST TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

All Schemes. All Claims	2011	2012	2013	2014	Average
Total Increase	9.02%	8.58%	9.19%	10.16%	9.24%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.11%</u>	<u>0.64%</u>	<u>1.81%</u>	<u>1.35%</u>	<u>1.48%</u>
Age	0.57%	2.81%	1.01%	0.87%	1.32%
Gender	-0.03%	-0.04%	0.05%	0.02%	0.00%
Disease Profile	0.99%	-0.53%	0.79%	0.32%	0.39%
Member Profile	1.86%	0.03%	0.07%	0.31%	0.57%
Plan Mix	-1.28%	-1.63%	-0.12%	-0.18%	-0.80%
<u>Unexplained Factors</u>	<u>1.90%</u>	<u>2.34%</u>	<u>1.68%</u>	<u>2.71%</u>	<u>2.16%</u>

TABLE 2: ALL CLAIMS COST TRENDS: ALL SCHEMES (BROAD DISEASE BURDEN)

All Schemes. All Claims	2011	2012	2013	2014	Average
Total Increase	9.02%	8.58%	9.19%	10.16%	9.24%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.40%</u>	<u>2.15%</u>	<u>2.61%</u>	<u>2.72%</u>	<u>2.97%</u>
Age	0.57%	2.81%	1.01%	0.87%	1.32%
Gender	-0.03%	-0.04%	0.05%	0.02%	0.00%
Disease Profile	2.78%	0.46%	1.64%	1.58%	1.61%
Member Profile	2.25%	-0.15%	-0.03%	0.31%	0.60%
Plan Mix	-1.17%	-0.93%	-0.07%	-0.06%	-0.56%
<u>Unexplained Factors</u>	<u>-0.38%</u>	<u>0.83%</u>	<u>0.88%</u>	<u>1.33%</u>	<u>0.67%</u>

28. Table 1 shows that, over the five year period from 2010 to 2014 the average claims cost per medical scheme beneficiary has increased by 9.24% per year, compared to an average CPI of 5.60%. Increasing average age has contributed 1.32% to the increase, while an increased disease burden has contributed 0.39% and members joining and leaving the industry, as well as moving between schemes and options, has contributed another 0.57%. Table 2 shows the same figures at an overall level, but shows an increased disease burden effect of 1.61%, which demonstrates the effect the broader disease burden grouping has on cost increases.

29. Changes in plan mix have contributed negatively, i.e. the industry appears to have experienced a net 'buy-down' effect, to the extent of 0.80% using the narrow grouping and 0.56% using the broad grouping. We note that this 'plan mix' factor is reflective of member movement between different types of plans as aggregated by characteristic, and no adjustments are made for benefit changes made to individual benefit options.

30. This leaves an unexplained increase of 2.16% per year on average using the narrow grouping and 0.67% using the broad grouping. This unexplained increase is potentially as a result of price increases over and above CPI, as well as increases in the volume of services utilised per

average utilising beneficiary. Some attempts will be made later in the report and in future reports to understand the nature and potential components of this unexplained increase.

31. The next four tables show the same analysis separately for open and restricted schemes, and show that the trends have been broadly the same, although restricted schemes show a smaller ageing effect as well as a smaller unexplained increase. It is also noted that the plan mix effect is much larger in open schemes than restricted schemes.

TABLE 3: ALL CLAIMS COST TRENDS: OPEN SCHEMES (NARROW DISEASE BURDEN)

Open Schemes, All Claims	2011	2012	2013	2014	Average
Total Increase	9.99%	5.97%	11.26%	9.81%	9.26%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.72%</u>	<u>-0.92%</u>	<u>2.01%</u>	<u>1.01%</u>	<u>1.21%</u>
Age	1.27%	3.24%	1.07%	0.83%	1.60%
Gender	-0.10%	-0.04%	0.05%	0.02%	-0.02%
Disease Profile	0.84%	-1.01%	1.81%	0.11%	0.44%
Member Profile	1.95%	-0.02%	-0.56%	0.66%	0.51%
Plan Mix	-1.25%	-3.08%	-0.36%	-0.61%	-1.33%
<u>Unexplained Factors</u>	<u>2.27%</u>	<u>1.29%</u>	<u>3.55%</u>	<u>2.70%</u>	<u>2.45%</u>

TABLE 4: ALL CLAIMS COST TRENDS, OPEN SCHEMES (BROAD DISEASE BURDEN)

Open Schemes, All Claims	2011	2012	2013	2014	Average
Total Increase	9.99%	5.97%	11.26%	9.81%	9.26%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.45%</u>	<u>0.01%</u>	<u>3.29%</u>	<u>2.41%</u>	<u>2.54%</u>
Age	1.27%	3.24%	1.07%	0.83%	1.60%
Gender	-0.10%	-0.04%	0.05%	0.02%	-0.02%
Disease Profile	2.32%	-1.09%	3.06%	1.35%	1.41%
Member Profile	2.20%	-0.12%	-0.82%	0.81%	0.52%
Plan Mix	-1.24%	-1.98%	-0.07%	-0.60%	-0.97%
<u>Unexplained Factors</u>	<u>0.54%</u>	<u>0.36%</u>	<u>2.27%</u>	<u>1.31%</u>	<u>1.12%</u>

TABLE 5: ALL CLAIMS COST TRENDS: RESTRICTED SCHEMES (NARROW DISEASE BURDEN)

Restricted Schemes, All Claims	2011	2012	2013	2014	Average
Total Increase	8.23%	11.70%	6.47%	10.47%	9.22%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.04%</u>	<u>2.20%</u>	<u>1.52%</u>	<u>1.60%</u>	<u>1.84%</u>
Age	0.03%	1.87%	0.93%	0.76%	0.90%
Gender	0.05%	-0.02%	0.05%	0.04%	0.03%
Disease Profile	0.95%	0.37%	-0.48%	0.69%	0.38%
Member Profile	1.79%	0.05%	0.86%	-0.14%	0.64%
Plan Mix	-0.77%	-0.06%	0.16%	0.26%	-0.11%
<u>Unexplained Factors</u>	<u>1.19%</u>	<u>3.89%</u>	<u>-0.75%</u>	<u>2.76%</u>	<u>1.77%</u>

TABLE 6: ALL CLAIMS COST TRENDS, RESTRICTED SCHEMES (BROAD DISEASE BURDEN)

Restricted Schemes, All Claims	2011	2012	2013	2014	Average
Total Increase	8.23%	11.70%	6.47%	10.47%	9.22%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>5.04%</u>	<u>4.60%</u>	<u>1.66%</u>	<u>2.98%</u>	<u>3.57%</u>
Age	0.03%	1.87%	0.93%	0.76%	0.90%
Gender	0.05%	-0.02%	0.05%	0.04%	0.03%
Disease Profile	3.05%	2.76%	-0.07%	2.00%	1.94%
Member Profile	2.33%	-0.21%	0.92%	-0.29%	0.69%
Plan Mix	-0.42%	0.19%	-0.18%	0.48%	0.02%
<u>Unexplained Factors</u>	<u>-1.81%</u>	<u>1.50%</u>	<u>-0.89%</u>	<u>1.39%</u>	<u>0.05%</u>

Out-of-hospital Claims Trends

32. Table 7 and Table 8 show the annual increases in total out-of-hospital cost per beneficiary across all schemes included in the dataset, including the contributions of some of the key cost drivers outlined in previous sections. We note that, as outlined above, the analyses are based on claimed amounts and therefore are only impacted by benefit limitations insofar as claims are not submitted to the scheme because limits have been used up.

TABLE 7: OUT-OF-HOSPITAL CLAIMS COST TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

All Schemes. OH Claims	2011	2012	2013	2014	Average
Total Increase	7.59%	5.23%	6.96%	9.33%	7.28%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.49%</u>	<u>-1.22%</u>	<u>1.50%</u>	<u>1.14%</u>	<u>0.98%</u>
Age	0.43%	2.14%	1.00%	0.73%	1.08%
Gender	-0.01%	-0.01%	0.03%	0.03%	0.01%
Disease Profile	1.46%	-0.85%	0.90%	0.62%	0.53%
Member Profile	2.24%	0.04%	0.09%	0.28%	0.66%
Plan Mix	-1.63%	-2.54%	-0.51%	-0.51%	-1.30%
<u>Unexplained Factors</u>	<u>0.10%</u>	<u>0.85%</u>	<u>-0.23%</u>	<u>2.09%</u>	<u>0.70%</u>

TABLE 8: OUT-OF-HOSPITAL CLAIMS COST TRENDS, ALL SCHEMES (BROAD DISEASE BURDEN)

All Schemes. OH Claims	2011	2012	2013	2014	Average
Total Increase	7.59%	5.23%	6.96%	9.33%	7.28%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.44%</u>	<u>0.38%</u>	<u>2.09%</u>	<u>1.99%</u>	<u>2.22%</u>
Age	0.43%	2.14%	1.00%	0.73%	1.08%
Gender	-0.01%	-0.01%	0.03%	0.03%	0.01%
Disease Profile	3.04%	0.25%	1.53%	1.53%	1.59%
Member Profile	2.51%	-0.16%	0.02%	0.25%	0.65%
Plan Mix	-1.53%	-1.84%	-0.48%	-0.54%	-1.10%
<u>Unexplained Factors</u>	<u>-1.84%</u>	<u>-0.74%</u>	<u>-0.82%</u>	<u>1.24%</u>	<u>-0.54%</u>

33. Table 7 shows that, over the five year period from 2010 to 2014 the average out-of-hospital claims cost per medical scheme beneficiary has increased by 7.28% per year, compared to a total cost increase of 9.24% and an average CPI of 5.60%. Ageing of the population has contributed 1.08% to the increase, while an increased disease burden has contributed 0.53% and members joining and leaving the industry, as well as moving between schemes and options, has contributed another 0.66%.
34. Changes in plan mix have contributed negatively, i.e. the industry appears to have experienced a net buy-down effect, to the extent of 1.30%. This leaves an unexplained increase of 0.70% per year on average. Table 8 shows similar trends using the broad disease burden approach, but show a higher disease burden effect and consequently a negative unexplained increase over the period analysed. This could reflect price increases below CPI, or increasing benefit limitation by schemes.
35. The next four tables show the same analysis separately for open and restricted schemes, and show that the trends have been broadly the same, although restricted schemes again show a smaller ageing effect as well as a smaller unexplained increase. It is again noted that the plan mix effect is much larger in open schemes than restricted schemes, by an even greater margin in this case.

TABLE 9: OUT-OF-HOSPITAL CLAIMS COST TRENDS: OPEN SCHEMES (NARROW DISEASE BURDEN)

Open Schemes, OH Claims	2011	2012	2013	2014	Average
Total Increase	8.73%	1.94%	9.61%	8.44%	7.18%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.73%</u>	<u>-3.38%</u>	<u>1.74%</u>	<u>0.72%</u>	<u>0.45%</u>
Age	0.96%	2.46%	1.02%	0.63%	1.27%
Gender	-0.10%	-0.02%	0.01%	0.02%	-0.02%
Disease Profile	1.10%	-1.38%	1.95%	0.35%	0.50%
Member Profile	2.24%	-0.14%	-0.33%	0.73%	0.63%
Plan Mix	-1.47%	-4.29%	-0.92%	-1.00%	-1.92%
<u>Unexplained Factors</u>	<u>1.00%</u>	<u>-0.28%</u>	<u>2.17%</u>	<u>1.61%</u>	<u>1.13%</u>

TABLE 10: OUT-OF-HOSPITAL CLAIMS COST TRENDS: OPEN SCHEMES (BROAD DISEASE BURDEN)

Open Schemes. OH Claims	2011	2012	2013	2014	Average
Total Increase	8.73%	1.94%	9.61%	8.44%	7.18%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.14%</u>	<u>-2.15%</u>	<u>2.70%</u>	<u>1.72%</u>	<u>1.60%</u>
Age	0.96%	2.46%	1.02%	0.63%	1.27%
Gender	-0.10%	-0.02%	0.01%	0.02%	-0.02%
Disease Profile	2.38%	-1.31%	2.94%	1.32%	1.33%
Member Profile	2.34%	-0.26%	-0.56%	0.85%	0.59%
Plan Mix	-1.44%	-3.02%	-0.72%	-1.09%	-1.57%
<u>Unexplained Factors</u>	<u>-0.41%</u>	<u>-1.51%</u>	<u>1.21%</u>	<u>0.62%</u>	<u>-0.02%</u>

TABLE 11: OUT-OF-HOSPITAL CLAIMS COST TRENDS: RESTRICTED SCHEMES (NARROW DISEASE BURDEN)

Restricted Schemes. OH Claims	2011	2012	2013	2014	Average
Total Increase	6.39%	9.30%	3.73%	10.44%	7.47%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.59%</u>	<u>1.35%</u>	<u>1.19%</u>	<u>1.61%</u>	<u>1.69%</u>
Age	0.09%	1.41%	0.97%	0.72%	0.80%
Gender	0.08%	0.03%	0.05%	0.05%	0.05%
Disease Profile	1.56%	0.19%	-0.38%	1.09%	0.61%
Member Profile	2.24%	0.25%	0.59%	-0.29%	0.70%
Plan Mix	-1.38%	-0.52%	-0.04%	0.04%	-0.48%
<u>Unexplained Factors</u>	<u>-1.20%</u>	<u>2.36%</u>	<u>-3.16%</u>	<u>2.73%</u>	<u>0.18%</u>

TABLE 12: OUT-OF-HOSPITAL CLAIMS COST TRENDS: RESTRICTED SCHEMES (BROAD DISEASE BURDEN)

Restricted Schemes. OH Claims	2011	2012	2013	2014	Average
Total Increase	6.39%	9.30%	3.73%	10.44%	7.47%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>5.17%</u>	<u>3.45%</u>	<u>1.32%</u>	<u>2.30%</u>	<u>3.06%</u>
Age	0.09%	1.41%	0.97%	0.72%	0.80%
Gender	0.08%	0.03%	0.05%	0.05%	0.05%
Disease Profile	3.43%	2.56%	-0.13%	1.94%	1.95%
Member Profile	2.70%	-0.03%	0.70%	-0.46%	0.73%
Plan Mix	-1.14%	-0.51%	-0.26%	0.05%	-0.47%
<u>Unexplained Factors</u>	<u>-3.78%</u>	<u>0.25%</u>	<u>-3.29%</u>	<u>2.04%</u>	<u>-1.19%</u>

36. It is noticeable that across both types of schemes as well as the industry as a whole, increases in out-of-hospital costs are substantially lower than total costs. This suggests cost shifting towards hospitalisation, which will be further explored in the next section.

In-hospital Claims Trends

37. Table 13 and Table 14 show the annual increases in total in-hospital cost per beneficiary across all schemes included in the dataset, including the contributions of some of the key cost drivers outlined in previous sections.

TABLE 13: IN-HOSPITAL CLAIMS COST TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

All Schemes, IH Claims	2011	2012	2013	2014	Average
Total Increase	10.24%	11.38%	10.95%	10.79%	10.84%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.61%</u>	<u>2.07%</u>	<u>1.58%</u>	<u>1.80%</u>	<u>2.01%</u>
Age	0.67%	3.33%	1.02%	0.98%	1.50%
Gender	-0.04%	-0.07%	0.07%	0.02%	0.00%
Disease Profile	0.76%	-0.68%	0.49%	0.21%	0.20%
Member Profile	1.79%	0.04%	-0.13%	0.35%	0.51%
Plan Mix	-0.57%	-0.55%	0.13%	0.23%	-0.19%
<u>Unexplained Factors</u>	<u>2.63%</u>	<u>3.71%</u>	<u>3.67%</u>	<u>2.89%</u>	<u>3.23%</u>

TABLE 14: IN-HOSPITAL CLAIMS COST TRENDS: ALL SCHEMES (BROAD DISEASE BURDEN)

All Schemes, IH Claims	2011	2012	2013	2014	Average
Total Increase	10.24%	11.38%	10.95%	10.79%	10.84%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.19%</u>	<u>3.09%</u>	<u>2.02%</u>	<u>2.54%</u>	<u>2.96%</u>
Age	0.67%	3.33%	1.02%	0.98%	1.50%
Gender	-0.04%	-0.07%	0.07%	0.02%	0.00%
Disease Profile	1.74%	0.06%	0.88%	0.83%	0.88%
Member Profile	2.14%	-0.01%	-0.09%	0.46%	0.63%
Plan Mix	-0.33%	-0.22%	0.13%	0.24%	-0.04%
<u>Unexplained Factors</u>	<u>1.06%</u>	<u>2.69%</u>	<u>3.23%</u>	<u>2.15%</u>	<u>2.28%</u>

38. Table 13 shows that, over the five year period from 2010 to 2014 the average in-hospital claims cost per medical scheme beneficiary has increased by 10.84% per year, compared to a total cost increase of 9.24% and an average CPI of 5.60%. The changing age profile has contributed 1.50% to the increase, while an increased disease burden has contributed 0.20% and members joining and leaving the industry, as well as moving between schemes and options, has contributed another 0.51%. Changes in plan mix have contributed marginally downward to the extent of 0.19%. Table 14 shows that, using the broad disease burden approach, the factors mostly remain unchanged other than a higher disease burden effect.
39. This leaves an unexplained increase of 3.23% per year on average using the narrow approach, and 2.28% using the broad approach. This unexplained increase is again potentially as a result of price increases over and above CPI, as well as increases in the volume of services utilised per average utilising beneficiary. The next four tables show the same analysis separately for open and restricted schemes, and shows that the trends have been broadly the same, although restricted schemes again show a smaller ageing effect as well as a smaller unexplained increase.

TABLE 15: IN-HOSPITAL CLAIMS COST TRENDS: OPEN SCHEMES (NARROW DISEASE BURDEN)

Open Schemes. IH Claims	2011	2012	2013	2014	Average
Total Increase	11.02%	9.21%	12.50%	10.82%	10.89%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>3.11%</u>	<u>1.25%</u>	<u>1.39%</u>	<u>1.50%</u>	<u>1.81%</u>
Age	1.51%	3.83%	1.10%	0.98%	1.86%
Gender	-0.10%	-0.06%	0.08%	0.02%	-0.01%
Disease Profile	0.56%	-1.04%	1.25%	0.04%	0.20%
Member Profile	1.89%	0.09%	-1.12%	0.70%	0.39%
Plan Mix	-0.76%	-1.57%	0.07%	-0.26%	-0.63%
<u>Unexplained Factors</u>	<u>2.91%</u>	<u>2.36%</u>	<u>5.41%</u>	<u>3.22%</u>	<u>3.48%</u>

TABLE 16: IN-HOSPITAL CLAIMS COST TRENDS: OPEN SCHEMES (BROAD DISEASE BURDEN)

Open Schemes. IH Claims	2011	2012	2013	2014	Average
Total Increase	11.02%	9.21%	12.50%	10.82%	10.89%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.53%</u>	<u>1.77%</u>	<u>2.09%</u>	<u>2.20%</u>	<u>2.65%</u>
Age	1.51%	3.83%	1.10%	0.98%	1.86%
Gender	-0.10%	-0.06%	0.08%	0.02%	-0.01%
Disease Profile	1.46%	-1.00%	1.83%	0.57%	0.72%
Member Profile	2.25%	0.03%	-1.11%	0.87%	0.51%
Plan Mix	-0.58%	-1.03%	0.19%	-0.25%	-0.42%
<u>Unexplained Factors</u>	<u>1.48%</u>	<u>1.84%</u>	<u>4.71%</u>	<u>2.52%</u>	<u>2.64%</u>

TABLE 17: IN-HOSPITAL CLAIMS COST TRENDS: RESTRICTED SCHEMES (NARROW DISEASE BURDEN)

Restricted Schemes. IH Claims	2011	2012	2013	2014	Average
Total Increase	9.91%	13.82%	8.80%	10.49%	10.76%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>2.77%</u>	<u>2.49%</u>	<u>1.87%</u>	<u>1.97%</u>	<u>2.28%</u>
Age	-0.02%	2.23%	0.91%	0.80%	0.98%
Gender	0.03%	-0.06%	0.06%	0.02%	0.01%
Disease Profile	0.78%	0.10%	-0.47%	0.53%	0.24%
Member Profile	1.71%	-0.09%	1.14%	-0.11%	0.66%
Plan Mix	0.27%	0.31%	0.24%	0.72%	0.39%
<u>Unexplained Factors</u>	<u>2.14%</u>	<u>5.72%</u>	<u>1.24%</u>	<u>2.42%</u>	<u>2.88%</u>

TABLE 18: IN-HOSPITAL CLAIMS COST TRENDS: RESTRICTED SCHEMES (BROAD DISEASE BURDEN)

Restricted Schemes. IH Claims	2011	2012	2013	2014	Average
Total Increase	9.91%	13.82%	8.80%	10.49%	10.76%
<u>CPI</u>	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>4.52%</u>	<u>4.29%</u>	<u>1.91%</u>	<u>2.79%</u>	<u>3.38%</u>
Age	-0.02%	2.23%	0.91%	0.80%	0.98%
Gender	0.03%	-0.06%	0.06%	0.02%	0.01%
Disease Profile	1.87%	1.72%	-0.30%	1.28%	1.14%
Member Profile	2.04%	-0.10%	1.20%	-0.05%	0.77%
Plan Mix	0.60%	0.50%	0.05%	0.74%	0.47%
<u>Unexplained Factors</u>	<u>0.39%</u>	<u>3.92%</u>	<u>1.19%</u>	<u>1.60%</u>	<u>1.78%</u>

40. It is noticeable that across both types of schemes as well as the industry as a whole, increases in in-hospital costs are substantially higher than total costs. This further suggests that there has been cost shifting towards hospitalisation across the industry over this period, which in terms of the various proxies used here cannot be entirely attributed to material changes in the risk profile of the beneficiaries.

41. In-hospital cost increases can be broadly driven by increases either in utilisation (number of admissions) or cost (per admission). The next set of tables shows the same attribution analysis performed on utilisation (admissions per 1 000 lives).

TABLE 19: HOSPITAL ADMISSION RATE TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

All Schemes. Admission Trends	2011	2012	2013	2014	Average
Total Increase	1.89%	1.95%	2.48%	2.37%	2.17%
<u>All Explanatory Factors</u>	<u>2.52%</u>	<u>-0.08%</u>	<u>0.76%</u>	<u>0.75%</u>	<u>0.99%</u>
Age	0.31%	1.32%	0.37%	0.36%	0.59%
Gender	-0.02%	0.00%	0.04%	0.04%	0.02%
Disease Profile	0.62%	-0.89%	0.36%	0.12%	0.05%
Member Movements	1.88%	0.08%	0.05%	0.23%	0.56%
Plan Mix	-0.27%	-0.59%	-0.06%	-0.01%	-0.23%
<u>Unexplained Factors</u>	<u>-0.63%</u>	<u>2.04%</u>	<u>1.72%</u>	<u>1.62%</u>	<u>1.19%</u>

TABLE 20: HOSPITAL ADMISSION RATE TRENDS: ALL SCHEMES (BROAD DISEASE BURDEN)

All Schemes. Admission Trends	2011	2012	2013	2014	Average
Total Increase	1.89%	1.95%	2.48%	2.37%	2.17%
<u>All Explanatory Factors</u>	<u>3.06%</u>	<u>1.13%</u>	<u>1.97%</u>	<u>1.98%</u>	<u>2.04%</u>
Age	0.31%	1.32%	0.37%	0.36%	0.59%
Gender	-0.02%	0.00%	0.04%	0.04%	0.02%
Disease Profile	2.50%	0.01%	1.38%	1.40%	1.32%
Member Movements	0.59%	0.00%	0.01%	0.09%	0.17%
Plan Mix	-0.32%	-0.20%	0.17%	0.09%	-0.06%
<u>Unexplained Factors</u>	<u>-1.17%</u>	<u>0.82%</u>	<u>0.51%</u>	<u>0.38%</u>	<u>0.14%</u>

42. Table 19 shows that admission rates per 1 000 lives have increased by 2.17% per year on average, of which 0.99% is attributable to changes in the beneficiary risk profile. This 0.99% is

dominated by ageing as well as membership movements in and out of schemes. There is an unexplained utilisation increase of 1.19% using the narrow disease burden approach, but Table 20 shows that this is practically eliminated using the broad approach. This could result because the broad approach uses hospitalisations to categorise lives, but additionally could result from other factors.

43. The corresponding tables for open and restricted schemes are again shown below. The trends look very similar to the overall trends, although it is noticeable that open schemes show a higher ageing effect, while counter-intuitively restricted schemes have been more heavily impacted by member movements.

TABLE 21: HOSPITAL ADMISSION RATE TRENDS: OPEN SCHEMES (NARROW DISEASE BURDEN)

Open Schemes. Admission Trends	2011	2012	2013	2014	Average
Total Increase	1.54%	0.47%	3.88%	2.18%	2.02%
<u>All Explanatory Factors</u>	<u>2.54%</u>	<u>-0.89%</u>	<u>0.95%</u>	<u>0.73%</u>	<u>0.83%</u>
Age	0.74%	1.58%	0.43%	0.40%	0.79%
Gender	-0.14%	-0.01%	0.02%	0.03%	-0.03%
Disease Profile	0.40%	-1.19%	1.05%	0.02%	0.07%
Member Movements	1.90%	-0.07%	-0.39%	0.56%	0.50%
Plan Mix	-0.36%	-1.19%	-0.17%	-0.28%	-0.50%
<u>Unexplained Factors</u>	<u>-1.00%</u>	<u>1.37%</u>	<u>2.93%</u>	<u>1.44%</u>	<u>1.18%</u>

TABLE 22: HOSPITAL ADMISSION RATE TRENDS: OPEN SCHEMES (BROAD DISEASE BURDEN)

Open Schemes. Admission Trends	2011	2012	2013	2014	Average
Total Increase	1.54%	0.47%	3.88%	2.18%	2.02%
<u>All Explanatory Factors</u>	<u>3.13%</u>	<u>-0.56%</u>	<u>3.44%</u>	<u>1.80%</u>	<u>1.95%</u>
Age	0.74%	1.58%	0.43%	0.40%	0.79%
Gender	-0.14%	-0.01%	0.02%	0.03%	-0.03%
Disease Profile	1.92%	-1.69%	3.06%	1.12%	1.10%
Member Movements	0.65%	-0.02%	-0.18%	0.15%	0.15%
Plan Mix	-0.04%	-0.42%	0.11%	0.11%	-0.06%
<u>Unexplained Factors</u>	<u>-1.59%</u>	<u>1.04%</u>	<u>0.44%</u>	<u>0.37%</u>	<u>0.07%</u>

TABLE 23: HOSPITAL ADMISSION RATE TRENDS: RESTRICTED SCHEMES (NARROW DISEASE BURDEN)

Restricted Schemes. Admission Trends	2011	2012	2013	2014	Average
Total Increase	2.39%	3.76%	0.79%	2.60%	2.39%
<u>All Explanatory Factors</u>	<u>2.58%</u>	<u>0.87%</u>	<u>0.53%</u>	<u>0.77%</u>	<u>1.18%</u>
Age	-0.04%	0.82%	0.30%	0.23%	0.33%
Gender	0.10%	0.06%	0.07%	0.08%	0.07%
Disease Profile	0.65%	-0.27%	-0.47%	0.33%	0.06%
Member Movements	1.86%	0.24%	0.57%	-0.17%	0.63%
Plan Mix	0.01%	0.02%	0.06%	0.29%	0.10%
<u>Unexplained Factors</u>	<u>-0.18%</u>	<u>2.89%</u>	<u>0.27%</u>	<u>1.83%</u>	<u>1.20%</u>

TABLE 24: HOSPITAL ADMISSION RATE TRENDS: RESTRICTED SCHEMES (BROAD DISEASE BURDEN)

Restricted Schemes. Admission Trends	2011	2012	2013	2014	Average
Total Increase	2.39%	3.76%	0.79%	2.60%	2.39%
<u>All Explanatory Factors</u>	<u>3.04%</u>	<u>3.21%</u>	<u>0.21%</u>	<u>2.20%</u>	<u>2.16%</u>
Age	-0.04%	0.82%	0.30%	0.23%	0.33%
Gender	0.10%	0.06%	0.07%	0.08%	0.07%
Disease Profile	2.74%	2.42%	-0.47%	1.90%	1.65%
Member Movements	0.53%	0.00%	0.20%	0.01%	0.19%
Plan Mix	-0.30%	-0.08%	0.10%	-0.02%	-0.07%
<u>Unexplained Factors</u>	<u>-0.64%</u>	<u>0.55%</u>	<u>0.59%</u>	<u>0.40%</u>	<u>0.22%</u>

Cost per Admission Trends

44. The tables above show that, although admission rates are potentially a significant contributor to the in-hospital cost trends outlined above, the cost per admission (CPA) appears to also have increased significantly faster than CPI. The next set of tables show the increases in cost per admission over the period analysed, broken down by various explanatory factors to attempt to isolate the contribution of each of these to the overall increase.

TABLE 25: ALL ADMISSIONS COST PER ADMISSION TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

All Schemes. CPA Trends	2011	2012	2013	2014	Average
Total Increase	8.28%	9.04%	9.10%	8.72%	8.79%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>-0.25%</u>	<u>0.95%</u>	<u>2.61%</u>	<u>1.48%</u>	<u>1.20%</u>
Age	0.57%	1.57%	1.40%	1.04%	1.15%
Gender	-0.01%	-0.03%	-0.02%	-0.02%	-0.02%
Disease Profile	-0.18%	0.19%	-0.12%	-0.15%	-0.06%
Case Mix	-0.31%	-0.48%	0.73%	0.18%	0.03%
PMB Diagnoses	-0.31%	-0.31%	0.61%	0.44%	0.11%
<u>Unexplained Factors</u>	<u>3.54%</u>	<u>2.49%</u>	<u>0.79%</u>	<u>1.14%</u>	<u>1.99%</u>

TABLE 26: ALL ADMISSIONS COST PER ADMISSION TRENDS: ALL SCHEMES (BROAD DISEASE BURDEN)

All Schemes. CPA Trends	2011	2012	2013	2014	Average
Total Increase	8.28%	9.04%	9.10%	8.72%	8.79%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>-0.12%</u>	<u>0.84%</u>	<u>2.60%</u>	<u>1.49%</u>	<u>1.20%</u>
Age	0.57%	1.57%	1.40%	1.04%	1.15%
Gender	-0.01%	-0.03%	-0.02%	-0.02%	-0.02%
Disease Profile	0.26%	-0.08%	-0.16%	-0.11%	-0.02%
Case Mix	-0.59%	-0.34%	0.77%	0.15%	0.00%
PMB Diagnoses	-0.34%	-0.29%	0.61%	0.44%	0.10%
<u>Unexplained Factors</u>	<u>3.40%</u>	<u>2.60%</u>	<u>0.80%</u>	<u>1.13%</u>	<u>1.98%</u>

45. Table 25 shows that cost per admission has increased by 8.79% per year on average, compared to average CPI of 5.60%. Of the increase above CPI, 1.20% can be explained by the factors outlined above with ageing (1.15%) the largest contributor, while 1.99% is a result of other unexplained factors. These results do not differ markedly when the broad disease burden grouping is used, as shown in Table 26.

46. These other factors could include price increases above CPI, as well as increases in length of stay, level of care and the general volume of services provided per admission beyond what would be expected as a result of those factors outlined in the table. These will be further analysed in future reports, most notably the facility and practitioner analyses.

47. The next four tables show the results for open and restricted schemes respectively. The results are similar to the overall results, although restricted schemes show a lower ageing effect and appear to be more impacted by PMB diagnoses.

TABLE 27: ALL ADMISSIONS COST PER ADMISSION TRENDS: OPEN SCHEMES (NARROW DISEASE BURDEN)

Open Schemes. CPA Trends	2011	2012	2013	2014	Average
Total Increase	8.69%	8.63%	9.67%	8.66%	8.91%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
All Explanatory Factors	<u>0.15%</u>	<u>0.50%</u>	<u>3.30%</u>	<u>1.15%</u>	<u>1.28%</u>
Age	0.86%	1.63%	1.57%	0.90%	1.24%
Gender	0.03%	-0.01%	0.00%	-0.02%	0.00%
Disease Profile	-0.17%	0.15%	-0.01%	-0.18%	-0.05%
Case Mix	-0.25%	-0.53%	1.07%	0.03%	0.08%
PMB Diagnoses	-0.31%	-0.74%	0.67%	0.42%	0.01%
<u>Unexplained Factors</u>	<u>3.54%</u>	<u>2.53%</u>	<u>0.67%</u>	<u>1.41%</u>	<u>2.04%</u>

TABLE 28: ALL ADMISSIONS COST PER ADMISSION TRENDS: OPEN SCHEMES (BROAD DISEASE BURDEN)

Open Schemes. CPA Trends	2011	2012	2013	2014	Average
Total Increase	8.69%	8.63%	9.67%	8.66%	8.91%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
All Explanatory Factors	<u>0.26%</u>	<u>0.43%</u>	<u>3.27%</u>	<u>1.18%</u>	<u>1.28%</u>
Age	0.86%	1.63%	1.57%	0.90%	1.24%
Gender	0.03%	-0.01%	0.00%	-0.02%	0.00%
Disease Profile	0.18%	-0.08%	-0.10%	-0.11%	-0.03%
Case Mix	-0.47%	-0.40%	1.14%	0.00%	0.07%
PMB Diagnoses	-0.34%	-0.72%	0.67%	0.41%	0.00%
<u>Unexplained Factors</u>	<u>3.43%</u>	<u>2.60%</u>	<u>0.70%</u>	<u>1.38%</u>	<u>2.03%</u>

TABLE 29: ALL ADMISSIONS COST PER ADMISSION TRENDS: RESTRICTED SCHEMES (NARROW DISEASE BURDEN)

Restricted Schemes. CPA Trends	2011	2012	2013	2014	Average
Total Increase	8.06%	9.46%	8.20%	8.66%	8.59%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
All Explanatory Factors	<u>-0.53%</u>	<u>1.45%</u>	<u>1.57%</u>	<u>1.83%</u>	<u>1.08%</u>
Age	0.37%	1.41%	1.12%	1.13%	1.01%
Gender	-0.06%	-0.07%	-0.06%	-0.04%	-0.05%
Disease Profile	-0.17%	0.25%	-0.27%	-0.12%	-0.08%
Case Mix	-0.33%	-0.45%	0.21%	0.36%	-0.05%
PMB Diagnoses	-0.34%	0.30%	0.57%	0.49%	0.25%
<u>Unexplained Factors</u>	<u>3.59%</u>	<u>2.41%</u>	<u>0.94%</u>	<u>0.73%</u>	<u>1.92%</u>

TABLE 30: ALL ADMISSIONS COST PER ADMISSION TRENDS: RESTRICTED SCHEMES (BROAD DISEASE BURDEN)

Restricted Schemes. CPA Trends	2011	2012	2013	2014	Average
Total Increase	8.06%	9.46%	8.20%	8.66%	8.59%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
All Explanatory Factors	<u>-0.53%</u>	<u>1.45%</u>	<u>1.57%</u>	<u>1.83%</u>	<u>1.08%</u>
Age	0.37%	1.41%	1.12%	1.13%	1.01%
Gender	-0.06%	-0.07%	-0.06%	-0.04%	-0.05%
Disease Profile	-0.17%	0.25%	-0.27%	-0.12%	-0.08%
Case Mix	-0.33%	-0.45%	0.21%	0.36%	-0.05%
PMB Diagnoses	-0.34%	0.30%	0.57%	0.49%	0.25%
<u>Unexplained Factors</u>	<u>3.59%</u>	<u>2.41%</u>	<u>0.94%</u>	<u>0.73%</u>	<u>1.92%</u>

48. In order to gain some high level insights into the types of admissions which could potentially be driving the high increases in the cost per admission as well as the large unexplained increases, the analyses have been repeated for surgical and medical admissions. In this context a surgical admission is defined as one where a theatre claim is recorded as part of the admission.

TABLE 31: SURGICAL ADMISSIONS COST PER ADMISSION TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

Surgical Admissions, CPA Trends	2011	2012	2013	2014	Average
Total Increase	9.36%	11.53%	10.90%	10.64%	10.61%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>0.66%</u>	<u>2.39%</u>	<u>3.43%</u>	<u>2.16%</u>	<u>2.16%</u>
Age	0.58%	2.31%	2.01%	1.38%	1.57%
Gender	-0.03%	0.00%	-0.02%	-0.03%	-0.02%
Disease Profile	-0.09%	0.13%	-0.13%	-0.07%	-0.04%
Case Mix	0.49%	0.09%	0.66%	0.14%	0.34%
PMB Diagnoses	-0.30%	-0.14%	0.91%	0.74%	0.30%
<u>Unexplained Factors</u>	<u>3.70%</u>	<u>3.54%</u>	<u>1.77%</u>	<u>2.38%</u>	<u>2.85%</u>

TABLE 32: SURGICAL ADMISSIONS COST PER ADMISSION TRENDS: ALL SCHEMES (BROAD DISEASE BURDEN)

Surgical Admissions, CPA Trends	2011	2012	2013	2014	Average
Total Increase	9.36%	11.53%	10.90%	10.64%	10.61%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>0.83%</u>	<u>2.33%</u>	<u>3.46%</u>	<u>2.16%</u>	<u>2.20%</u>
Age	0.58%	2.31%	2.01%	1.38%	1.57%
Gender	-0.03%	0.00%	-0.02%	-0.03%	-0.02%
Disease Profile	0.38%	0.00%	-0.11%	-0.08%	0.04%
Case Mix	0.25%	0.14%	0.67%	0.15%	0.30%
PMB Diagnoses	-0.34%	-0.12%	0.91%	0.74%	0.30%
<u>Unexplained Factors</u>	<u>3.52%</u>	<u>3.60%</u>	<u>1.74%</u>	<u>2.38%</u>	<u>2.81%</u>

TABLE 33: MEDICAL ADMISSIONS COST PER ADMISSION TRENDS: ALL SCHEMES (NARROW DISEASE BURDEN)

Medical Admissions, CPA Trends	2011	2012	2013	2014	Average
Total Increase	7.68%	8.26%	8.36%	8.51%	8.20%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>-0.76%</u>	<u>0.74%</u>	<u>2.56%</u>	<u>1.94%</u>	<u>1.12%</u>
Age	0.61%	1.33%	1.16%	0.88%	0.99%
Gender	-0.01%	-0.04%	-0.02%	-0.02%	-0.02%
Disease Profile	-0.22%	0.20%	-0.11%	-0.21%	-0.09%
Case Mix	-0.88%	-0.28%	1.17%	1.00%	0.25%
PMB Diagnoses	-0.26%	-0.48%	0.37%	0.29%	-0.02%
<u>Unexplained Factors</u>	<u>3.44%</u>	<u>1.93%</u>	<u>0.10%</u>	<u>0.47%</u>	<u>1.48%</u>

TABLE 34: MEDICAL ADMISSIONS COST PER ADMISSION TRENDS: ALL SCHEMES (BROAD DISEASE BURDEN)

Medical Admissions. CPA Trends	2011	2012	2013	2014	Average
Total Increase	7.68%	8.26%	8.36%	8.51%	8.20%
CPI	<u>5.00%</u>	<u>5.60%</u>	<u>5.70%</u>	<u>6.10%</u>	<u>5.60%</u>
<u>All Explanatory Factors</u>	<u>-0.68%</u>	<u>0.57%</u>	<u>2.52%</u>	<u>1.96%</u>	<u>1.09%</u>
Age	0.61%	1.33%	1.16%	0.88%	0.99%
Gender	-0.01%	-0.04%	-0.02%	-0.02%	-0.02%
Disease Profile	0.17%	-0.15%	-0.18%	-0.14%	-0.08%
Case Mix	-1.17%	-0.10%	1.21%	0.95%	0.22%
PMB Diagnoses	-0.28%	-0.47%	0.36%	0.28%	-0.03%
<u>Unexplained Factors</u>	<u>3.35%</u>	<u>2.09%</u>	<u>0.14%</u>	<u>0.46%</u>	<u>1.51%</u>

49. The tables show that the cost per admission increase is much larger for surgical than medical admissions, and the unexplained factors follow the same pattern. This may suggest that whichever unexplained factors are impacting cost per admission are more prevalent in surgical than medical admissions.

CONCLUSION

50. Per beneficiary claims costs have increased by around 4% above CPI on a consistent basis, of which around 2% is attributable to demographic factors;
51. There is evidence which suggests a significant cost shifting towards hospitalisation, with in-hospital claims increasing at a rate around 3% faster than out-of-hospital claims; and
52. The in-hospital claims increases are being driven both by utilisation (increasing numbers of admissions) and cost per admission.
53. Further detailed analyses will be provided in future reports which attempt to unpack some of the trends outlined in this report, specifically the unexplained claims increases which cannot be explained by the demographic factors. The facility and practitioner analysis reports in particular will showcase some detailed analyses aimed at breaking down the components of this unexplained increase.