



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 –
DESCRIPTIVE STATISTICS

VERSION 2: 8 DECEMBER 2017

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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.

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 Act . 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 is the first of a set of reports and is a descriptive analysis of the data received. Further reports will use the available data to describe how various factors influence costs and change in costs over time (the attribution analyses), describing the impact of prescribed minimum benefits, billing practises and other related analyses. These reports are put out for information and comments are welcome.
6. This report is based on work done for the HMI by WTW.

Approach to understanding health care expenditure

7. One of the objectives of the HMI is to analyse the drivers of expenditure in the private healthcare industry. The data held by medical schemes provides the best basis to form as holistic a view as possible of expenditure in the private sector, and hence is the primary source of data for many of the expenditure analyses undertaken by HMI.
8. These data do not report out-of-pocket spending where an individual pays a provider directly and does not submit this to their medical aid for reimbursement or is not a member of a medical aid.
9. The analyses presented in this, and subsequent reports in this series, are based on the detailed claims and membership data submitted either by the medical schemes directly or by the medical scheme administrators on behalf of the scheme. This has been supplemented with other data sources such as the practice numbering system files submitted by the Board of Healthcare Funders (BHF) and data provided by the hospitals, where necessary.

DATA

Data requested

10. The HMI send an information request to registered medical schemes in March 2015 requesting one year of data. One aim was to assess the structure of the medical schemes claims data and ascertain what was routinely available in order to inform our approach to gathering, storing and analysing these data.
11. A further call for claims data was made in October 2015. The HMI requested all claims submitted to medical schemes for treatments that occurred over the five-year period from 2010 to 2014. The expectation was that all claims would have been submitted by members to their medical schemes by October 2015 so that the HMI would have complete data for all requested years.
12. Stakeholders were requested to submit data in four files and seven tables:
 - 12.1. File one containing:
 - 12.1.1. All of the healthcare providers with respect to whom claims had been submitted;
 - 12.1.2. Information on the provider geographic location; and
 - 12.1.3. The network contracts that the provider had agreed with the medical scheme.
 - 12.2. File two containing:
 - 12.2.1. A list of all claim lines submitted to the medical scheme for the treatment period;
 - 12.2.2. The service dates upon which the claims were incurred;
 - 12.2.3. The values of the claims submitted by the service providers in Rand;
 - 12.2.4. The values of the benefits paid by the medical schemes in Rand from members' risk/insured benefits;
 - 12.2.5. The values of benefits paid by medical schemes in Rand from members' personal savings accounts;
 - 12.2.6. Information on the diagnoses codes (ICD10) pertaining to each claim;

- 12.2.7. Information on the service/procedure codes (tariff codes and NAPPI codes) pertaining to each claim;
 - 12.2.8. Information on the codes used to determine how each claim was classified for payment against the medical scheme rules (rule code);
 - 12.2.9. Flags to indicate the benefit category from which each claim was paid, for example an in-hospital claim versus a Prescribed Minimum Benefit (PMB); and
 - 12.2.10. Various reference numbers which link the file to the provider, member and beneficiary files.
- 12.3. File three containing:
- 12.3.1. A list of all medical scheme beneficiaries who were entitled to submit a claim for treatment over the treatment period;
 - 12.3.2. The gender of each beneficiary;
 - 12.3.3. The date of birth of each beneficiary;
 - 12.3.4. The medical scheme service history for each beneficiary; and
 - 12.3.5. Various reference numbers which link the file to the member file and the table containing RSA identity numbers.
- 12.4. File four containing:
- 12.4.1. A list of all medical scheme main members who were entitled to submit a claim for treatment over the treatment period;
 - 12.4.2. A history of medical scheme main members' income;
 - 12.4.3. A history of and medical scheme plan options; and
 - 12.4.4. A reference number which links the file to the medical scheme main members' address history table.
- 12.5. The following tables were requested:
- 12.5.1. A scheme table to provide descriptions of the various medical schemes in the dataset and the associated benefit options for each of the years covered;
 - 12.5.2. Rule code table to provide descriptions of the various rule codes applied during the assessment of claims;

- 12.5.3. In-house code table to provide descriptions of the in-house codes used by the administrator to pay claims where the standard tariff code tables were supplemented;
- 12.5.4. Details of RSA identity number table;
- 12.5.5. Family number table to provide details of the numbers used by the administrator to identify different families on each scheme;
- 12.5.6. Date of birth table; and
- 12.5.7. The address history of the member/beneficiary were requested in separate tables.

Approach to confidentiality

- 13. Confidential data is protected in accordance with the Competition Act. Date of birth, identity numbers and address data contain personal information that is protected. To protect information submitted and ensure anonymity the HMI published a “De-identification of personal data” document on the 1st of June 2016 and a related “Health Market Inquiry Standard Operating Procedure for Data De-identification” published on the 6th of November 2015. The de-identification of data was performed by the HMI. Subsequent to de-identification data could be linked appropriately but it was not possible to know the individual to whom the data referred. Thus all data, from then on, was anonymised. It is these anonymised data that was used for the analytical work. It was possible for any individual to be defined, for example, as a male with asthma who saw a particular doctor and was admitted to a particular hospital but not to know who that individual is or where they live beyond a reference to the Statistics South Africa enumerator area they live in.

Data received

- 14. In 2014 the CMS listed 91 registered medical schemes and noted that during the year 8 deregistered leaving 83 schemes still registered at the end of 2014. The requests outlined above were sent to these 83 registered medical schemes. Additional data was submitted for 10 schemes that were not approached but for whom data was available at some period between 2010-2014.
- 15. We received no data from three schemes listed in table 1.

TABLE 1: MEDICAL SCHEMES WITH NO SUBMISSION TO THE HMI

| 16. Scheme | Administrator | Notes |
|---------------------------------------|---|-------|
| Community Medical Aid Scheme (COMMED) | Allcare Administrators (Pty) Ltd | |
| Genesis Medical Scheme | Self-Administered | |
| Makoti Medical Scheme | Universal Healthcare Administrators (Pty) Ltd | |
| Parmed Medical Aid Scheme | Medscheme | |

Data quality

17. There is no industry standard data specification in the South African medical schemes industry. There has also been a proliferation of different administration systems in the South African medical schemes industry and changes in data management systems within one scheme over time. While formal specifications were sent to all stakeholders, nonetheless data was received in various non-comparable formats. This required a series of to-and-froes between the HMI and stakeholders to ensure clarity and data fidelity.
18. The variability of the data format and administrative systems used by schemes required unique cleaning algorithms to be developed to cater for each submitter.
19. As standard conventions do not exist regarding how practice numbers, tariff, NAPPI and ICD10 codes should be captured, stored and/or provided, data manipulation to make these comparable was required.
20. The HMI had to request some schemes to re-submit data.
21. This process was time consuming and the HMI had to balance having a complete data set against time limitations. After careful assessment of the additional benefit that would have been obtained if further efforts had been made to obtain additional correct and/or useable data, the HMI decided on a cut-off point (31 July 2016) after which data would no longer be processed.

Data quality checks

22. Following best practise, a number of checks on the quality and completeness of the data were performed before data were ready for analysis.
23. Quality assessment involved two broad steps:
 - 23.1. Checking that the data is consistent with itself i.e. that all years are submitted in the same format and that formats and other data characteristics are consistent across the dataset. For the medical scheme data this also involved making sure that the claims data could be matched to the membership data when the data were combined. This process was carried out in the data warehouse and has no formal outputs.
 - 23.2. Another level of quality control is to assess if data received is consistent with an external data source, if such exists.
24. For this exercise, the CMS data were used as CMS data are audited data that schemes are required by law to provide to the CMS. This allowed us to assess if the HMI data were the same as those data that the schemes themselves have verified as true and correct in the CMS submissions. Each year's total membership and claims data were checked against the applicable CMS annual report which contains financial details for all registered schemes.

Building of analysis datasets

25. The datasets extracted from the data warehouse and provided to the analysis team are large and cumbersome to work with on a routine basis. For this reason summarised analysis datasets were built to enable analysis at a high level of detail without returning to the raw data every time a new analysis is commissioned. These datasets form the basis for the quantitative claims analyses undertaken by the HMI, and are structured as follows:
26. The 'Beneficiary' dataset contains demographic information for every registered beneficiary in each of the years analysed, as well as several beneficiary characteristics and some summarised claims information;
27. The 'Admissions' dataset contains details of each hospital admission in each year, including details of treating practitioners, treating facilities, diagnostic and procedure information as well as demographic information about the patient; and

28. The 'Disciplines' dataset contains summarised cost trends by various cost categories, which are used to produce the summarised claims statistics contained in this report.

Results of quality checks and final dataset

29. The seven schemes in Table 2 made submissions, but their submissions were not complete in the respects outlined below. Their data could therefore not be imported into the warehouse for processing.

TABLE 2: MEDICAL SCHEMES WITH INCOMPLETE SUBMISSIONS TO THE HMI

| Scheme | Administrator | Notes |
|---|------------------------------------|---|
| Building & Construction Industry Medical Aid Fund | Universal Administrators (Pty) Ltd | Healthcare Claims file missing medicine information |
| Compicare Wellness Medical Scheme | Universal Administrators (Pty) Ltd | Healthcare Claims file missing medicine information |
| Grintek Electronics Medical Aid Scheme | Universal Administrators (Pty) Ltd | Healthcare Claims file missing medicine information |
| Massmart Health Plan | Universal Administrators (Pty) Ltd | Healthcare Claims file missing medicine information |
| Medimed Medical Scheme | Providence Managers (Pty) Ltd | Healthcare Risk No membership listings provided |
| Platinum Health | Self-Administered | No membership listings provided |
| Tiger Brands Medical Scheme | Universal Administrators (Pty) Ltd | Healthcare Claims file missing medicine information |

30. As outlined above, the data cleaning process required either clarifications or re-submissions from a number of schemes, the majority of which were received prior to the cut-off point for inclusion in the final dataset. However, a few schemes did

not provide re-submitted data in time and were excluded from the final analysis dataset. They are listed in table 3.

TABLE 3: MEDICAL SCHEMES WITH MATERIAL DATA MISMATCHES

| 31. Scheme | | Administrator | | Notes |
|--------------------------|----------------|---|--|---|
| Sizwe Medical Fund | | Sechaba | Medical Solutions (Pty) Ltd | No link between membership and claims files |
| Hosmed Medical Scheme | | Thebe | Ya Bophelo Healthcare Administrators (Pty) Ltd | No link between membership and claims files |
| Sisonke Health Scheme | Medical | Providence Managers (Pty) Ltd | Healthcare Risk | Significant unmatched claims, some beneficiaries not assigned to policy |
| Suremed Health | | Providence Managers (Pty) Ltd | Healthcare Risk | Significant unmatched claims, some beneficiaries not assigned to policy |
| Rhodes University Scheme | Medical | Providence Managers (Pty) Ltd | Healthcare Risk | No policy file, significant unmatched claims |
| Alliance Scheme | Midmed Medical | Private Health Administrators (Pty) Ltd | | Incomplete addresses provided |
| Topmed Medical Scheme | | Private Health Administrators (Pty) Ltd | | Incomplete addresses provided |

32. As per the 2014 CMS report, the data available to the HMI for analysis represents just over 94% of the industry – see Figure 1 for details.

Membership numbers reasonability checks

33. In order to assess the completeness of the membership files supplied by the stakeholders, the total exposed beneficiaries calculated for each submitting scheme from the data provided was compared to the total figures provided in the Council for Medical Schemes annual reports for the periods covered. The detailed results are contained in Appendix A, and show the calculated membership per

scheme per year divided by the membership reported in the CMS report (100% would indicate an exact match in this case). The general findings from the comparison were as follows.

- 33.1. In the majority of cases, the figures were very close, allowing for that fact the backdated membership changes can occur and for the inherent volatility of membership databases;
- 33.2. However, certain specific issues were identified as follows:
 - 33.2.1. Afrisam Medical Scheme amalgamated with Discovery Health Medical Scheme on 1 June 2010 and hence the data is incomplete for 2010 and no data exists after 2010 (even though the scheme no longer operates, the data has been kept by Discovery Health (Pty) Ltd (Discovery Health) and was provided to the HMI);
 - 33.2.2. Altron Medical Scheme amalgamated with Discovery Health Medical Scheme on 1 January 2014 and hence no data exists after 2013 (again, even though the scheme no longer operates, the data has been kept by Discovery Health and was provided to the HMI);
 - 33.2.3. Anglo Medical Scheme changed administrators from Momentum to Discovery Health on 1 January 2014, and it appears the historical data kept by Momentum and provided to the HMI overstates the membership of the scheme;
 - 33.2.4. BMW Employees Medical Aid Scheme changed administrators from Medscheme to Discovery Health on 1 January 2014, but the historical data was not provided by Medscheme, and thus BMW is only included for 2014;
 - 33.2.5. Edcon Medical Aid Scheme amalgamated with Discovery Health Medical Scheme on 1 January 2012 and hence no data exists after 2011 (again, even though the scheme no longer operates, the data has been kept by Discovery Health and was provided to the HMI);
 - 33.2.6. Glencore Medical Aid Scheme only provided data for the 2014 benefit year, and was not included in CMS reports prior to 2014;

- 33.2.7. IBM South Africa Medical Scheme amalgamated with Discovery Health Medical Scheme on 1 July 2013 and hence the data is incomplete for 2013 and does not exist for 2014 (again, even though the scheme no longer operates, the data has been kept by Discovery Health and was provided to the HMI);
- 33.2.8. Impala Medical Plan did not submit data for 2010 and 2011, and the data submitted for the other years appears from a comparison to the CMS report to be incomplete;
- 33.2.9. KeyHealth were only able to submit data for 2013 and 2014;
- 33.2.10. Malcor Medical Scheme changed administrators from Eternity to Discovery Health in 2015 and although Discovery Health submitted data in respect of Malcor, the data did not cover the period requested and hence no submission could be used for Malcor;
- 33.2.11. Medihelp were only able to submit data from 2012;
- 33.2.12. Naspers Medical Fund was self-administered in 2010 and transferred to Discovery Health from 2011 and, although some data was provided in respect of 2010 by Discovery Health, it appears incomplete;
- 33.2.13. PG Group Medical Scheme is still operational, but only submitted data for 2010 and 2011;
- 33.2.14. Profmed was only able to submit data from 2013;
- 33.2.15. Resolution Health Medical Scheme was only able to submit data from 2012;
- 33.2.16. A comparison with the CMS report would suggest that SAMWUMED has submitted membership data which is incomplete;
- 33.2.17. Sedmed was only able to provide data from 2012, and appears to have been excluded from the 2013 CMS report for non-submission of their annual financial reports;
- 33.2.18. Selfmed was only able to provide data from 2012, and the membership files appear to overstate the membership of the scheme;

- 33.2.19. Spectramed was only able to provide data from 2012;
- 33.2.20. TFG Medical Aid Scheme was only able to provide data from 2012;
- 33.2.21. Umed amalgamated with Discovery Health Medical Scheme on 1 August 2010 and hence the data is incomplete for 2010 and no data exists after 2010(again, even though the scheme no longer operates, the data has been kept by Discovery Health and was provided to the HMI); and
- 33.2.22. Witbank Coalfields Medical Scheme appears to have provided an incomplete membership listing as part of its submission.

Claim amounts reasonability checks

- 34. In order to assess the completeness of the claims data files supplied by the stakeholders, the total insured benefits calculated for each submitting scheme from the data provided was compared to the total figures provided in the income statements outlined in the Council for Medical Schemes annual reports for the periods covered. The detailed results are contained in Appendix B, and show the calculated claims incurred per scheme per year divided by the membership reported in the CMS report (100% would again indicate an exact match in this case).
- 35. We note that the CMS figures include some managed care and capitation arrangements which won't feed into the detailed data, so claims figures are expected to be lower for schemes with significant risk transfer type arrangements. The general findings from the comparison were as follows:
 - 35.1. In the majority of cases, the figures were very close, allowing for the fact that claims can be submitted post the CMS reporting and for the inherent volatility of claims databases;
 - 35.2. However, certain specific issues were identified as follows:
 - 35.2.1. The same set of issues around incomplete submissions and amalgamations will be relevant to this comparison as well;
 - 35.2.2. As with the membership, the claims amounts in the Anglo Medical Scheme data supplied by Momentum appear to be overstated;
 - 35.2.3. Again, as with the membership, Food Workers Medical Benefit Fund appears to have provided an incomplete set of data;

- 35.2.4. Horizon Medical Scheme shows lower claims than outlined in the CMS report, however the CMS report also indicates a significant risk transfer arrangement for the scheme, which is likely the reason for the difference;
- 35.2.5. As per the membership data checks above, Impala Medical Plan appears to have provided an incomplete dataset, although a significant risk transfer arrangement is also reported in the CMS report for the scheme;
- 35.2.6. Lonmin Medical Scheme also shows significantly lower claims than outlined in the CMS report, however the CMS report also indicates a significant risk transfer arrangement for the scheme, which is likely the reason for the difference;
- 35.2.7. The Naspers Medical Fund issue for 2010 is also evident in the claims data;
- 35.2.8. As per the membership file checks, SAMWUMED appears to have provided incomplete data;
- 35.2.9. Umvuzo Health also shows significantly lower claims than outlined in the CMS report, however the CMS report also indicates a significant risk transfer arrangement for the scheme, which is likely the reason for the difference;
- 35.2.10. Witbank Coalfields Medical Aid Scheme also shows significantly lower claims than outlined in the CMS report, however the CMS report again indicates a significant risk transfer arrangement for the scheme, which is likely the reason for the difference.

Results of reasonability checks

- 36. As a result of the checks against the CMS report, three key issues have been identified, and our approach to them is as follows:
- 37. A number of schemes have only provided data for part of the requested time period (2010-2014); either for systems reasons or because the scheme amalgamated and is no longer registered independently. These data have been included in our analyses. Thus when total numbers are used these may vary, for example, in a year it would appear that there are more lives covered but this is as a result of more complete data for that year rather than a real change in the number of lives covered. Membership analysis (number of lives covered) at the industry level are

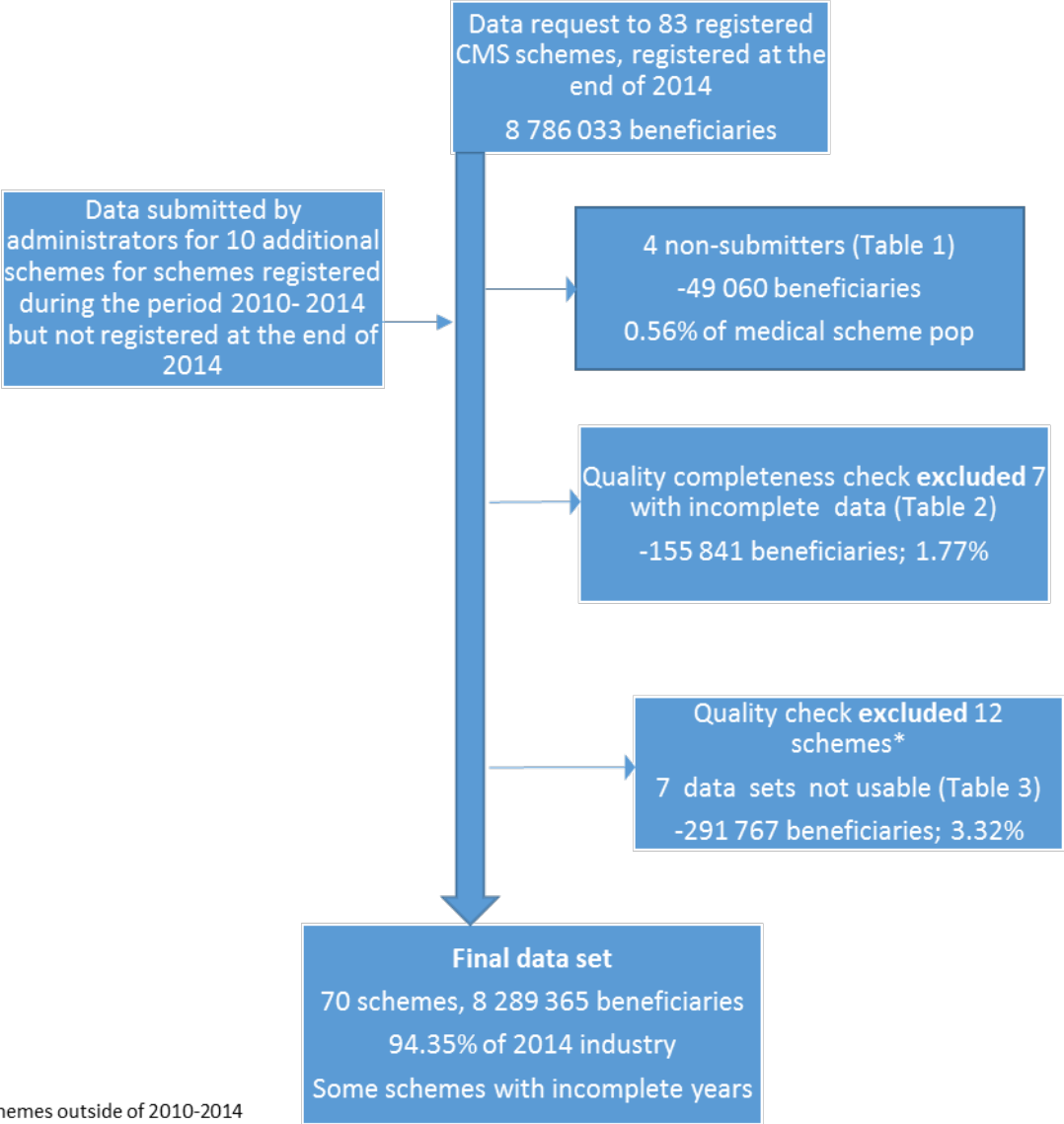
best understood using CMS data. However when analyses are done as a ratio the numerator and denominator are aligned and these results are not impacted by missing data for particular years. Trend analyses are conducted at a 'per beneficiary' level and are thus unaffected by the change in absolute numbers.

38. A number of schemes appear to have provided incomplete data for both membership and claims. However the incompleteness is consistent across both files, and suggests only a subset of members has been provided to the HMI for whatever reason. Since the analysis data has been cleaned to ensure all claims match to the membership file, there is no problem including these schemes in the analysis dataset. However, to the extent these schemes are isolated in any individual analyses, the results should be interpreted with some caution.
39. Anglo Medical Scheme shows overstated claims and membership for the years it was administered by Momentum. Since the scheme is small and no specific analyses by individual scheme are envisaged, the results should not be materially impacted by including the Momentum data. This could be important since Anglo Medical Scheme is the only case where data has been supplied pre- and post an administration change for a scheme, if specific analysis results based on the Momentum data is used to understand pre-post administration change for this case, it should be interpreted with caution.

Final data set used for analysis

40. A graphic illustration of the final data set, the number of lives covered and percentage of the industry reflected in the analyses is presented in Figure 1 below.

FIGURE 1: 2014 INDUSTRY, RESULTS OF QUALITY CHECKS



* 5 schemes outside of 2010-2014 period

METHODOLOGY

41. We describe our approach to produce the summary analysis datasets and the methods used in preparing the descriptive statistics presented in this report. It should be noted that methods presented here will also be relevant to subsequent publications on further analyses forthcoming.

Beneficiary file

42. As outlined above, the beneficiary file contains various demographic information about each (anonymised) registered beneficiary in each benefit year, as well as some indicators built off claims data and summary claims information.

Demographic information

43. The majority of the demographic information (age, gender, medical scheme, plan selection, dependent type) was extracted directly from the information provided by the stakeholders. In addition to this we have created indicator variables to assess disease profiles and member movements around the industry:

- 43.1. For the purposes of assessing changes in disease burden, two approaches have been used to accommodate narrow and broad definitions for building indicators of a beneficiary's health status. The results of the two different approaches are provided in those analyses where the chronic disease indicator is used.

- 43.2. The "Narrow Disease Burden" beneficiary profile indicator is created as follows:

- 43.2.1. ICD10 codes are grouped using the Clinical Classifications Software (CCS) published by the Healthcare Cost and Utilisation Project (HCUP) into clinically consistent diagnosis groups, which are summarised into the 18 groups used for the indicator;

- 43.2.2. As far as possible, medicine NAPPI codes are mapped to the conditions they are used to treat, and similarly assigned a summary group;

- 43.2.3. A beneficiary is then assigned to a group if either:

- 43.2.4. They have two or more out-of-hospital medical practitioner consultations within that diagnosis group; or

- 43.2.5. They have a single out-of-hospital medical practitioner consultation within that group, but have also claimed two or more times for medications associated with that diagnosis group.
 - 43.2.6. The conditions are then prioritised by severity and beneficiaries assigned uniquely to the group corresponding to the most severe of the conditions they have been assigned to e.g. if a beneficiary is assigned to the 'Acute Respiratory' and 'HIV' groups they will be labelled as 'HIV'.
- 43.3. The "Broad Disease Burden" definition for building a profile of a beneficiary's health includes additional data sources in order to capture an alternative measure of disease burden, and additionally makes allowance for so-called co-morbidities (patients with multiple chronic diseases). The "Broad Disease Burden" beneficiary profile indicator is created as follows:
- 43.3.1. 64 indicator groups are created for each beneficiary, reflecting different potential conditions a beneficiary could be diagnosed with. Lives are assigned into these categories if:
 - 43.3.2. They have one or more hospitalisations with a diagnosis reflecting the given condition (using the same mapping of ICD10 codes as used for the clinical profile indicator);
 - 43.3.3. They have three or more medical practitioner consultations with a diagnosis reflecting the given condition;
 - 43.3.4. They have medicine claims in three or more calendar months over the year in respect of medicines used to definitively treat the given condition (using the same mapping of NAPPI codes as used for the clinical profile indicator); or
 - 43.3.5. Various special limits are met for specific categories (dentist visits for the mouth disorder group, optometry claims and its associated group, and psychologist visits for the psychiatric conditions group).
 - 43.3.6. These 64 groups are summarised into 18 chronic condition groups; and
 - 43.3.7. A unique status for each beneficiary is created from these 18 groups by:

- 43.3.8. Isolating maternity, major trauma and oncology cases into a 'high cost event' group;
 - 43.3.9. Assigning a primary chronic condition to each of the beneficiaries with one of the chronic disease flags active, using a clinically determined hierarchy;
 - 43.3.10. Assigning the number of co-morbidities or additional chronic conditions, up to a maximum of 2 additional conditions; and
 - 43.3.11. Dividing the remaining group into those with only acute conditions and those with no active flags.
44. The member movements indicator is created as follows (we note that reliable mortality data is not universally available in the industry and was therefore not requested by the HMI):
- 44.1. Beneficiaries joining their scheme (not the industry) in the analysis year for any reason are grouped as 'Joiners';
 - 44.2. Beneficiaries resigning from their scheme in the analysis year for any reason are grouped as 'Leavers';
 - 44.3. Beneficiaries who joined their scheme and resigned from it in the same year are grouped together as 'Temporary' beneficiaries;
 - 44.4. Beneficiaries who are on a different plan within the same scheme in the analysis year to the one they were on in the previous year are grouped as 'Switchers'; and
 - 44.5. All other beneficiaries are grouped as 'Stayers'.

Claims utilisation indicators

45. A number of claims utilisation indicators have been built in an attempt to assess how beneficiaries navigate through the healthcare system when in need of care. These refer to what type of medical practitioners a beneficiary claims from, how many different practices are visited and how many services are used. The indicators are as follows:
- 45.1. The medical practitioner usage indicator aims to assess the extent to which members use general practitioners as an entry point to the healthcare system. Beneficiaries are grouped into four groups as follows:

- 45.2. Those who have not seen a medical practitioner (either general practitioner or specialist);
- 45.3. Those who have only seen general practitioners;
- 45.4. Those who have visited both general practitioners and specialists; and
- 45.5. Those who have only visited specialists.
- 45.6. The multiple medical practitioner indicator aims to assess whether beneficiaries consistently use one medical practitioner, or whether they change practitioners regularly. The indicator is 'Yes' if a beneficiary submits claims for treatment by more than two different practitioners within the same discipline in the same year.
- 45.7. The pathology usage indicator measures the number of pathology tests performed on a beneficiary in a given year. The indicator is:
 - 45.8. 'None' if there are no claims for pathology;
 - 45.9. 'Low' if a beneficiary claims for pathology, but for significantly fewer than average tests (where average tests is calculated as tests per claiming beneficiary);
 - 45.10. 'Average' if the number of tests is similar to the average for those beneficiaries who claim for pathology services; and
 - 45.11. 'High' if a beneficiary claims for significantly more pathology tests than the average.
- 45.12. The radiology usage indicator is created for the same reason and in the same way as the pathology usage indicator.

Summary claims information

46. In the beneficiary file claims are split between out-of-hospital and in-hospital claims. In-hospital claims are identified by using the dates provided on hospital claims to assess the days on which a beneficiary was hospitalised (claimed from one or more hospitals) and assuming that all claims incurred on the days a beneficiary was hospitalised relate to the hospitalisation and are in-hospital claims. The claims are then grouped as follows:
 - 46.1. Out-of-hospital claims are grouped by discipline as follows:
 - 46.2. Medicines, consumables and surgical items (any items where a NAPPI codes is claimed and all pharmacy claims);

- 46.3. General practitioner;
 - 46.4. Specialists, including anaesthetists to the extent there are out-of-hospital claims;
 - 46.5. Pathology;
 - 46.6. Radiology;
 - 46.7. Auxiliary services; and
 - 46.8. Other.
47. Out-of-hospital Prescribed Minimum Benefit (PMB) diagnosis claims are also summarised in the beneficiary file. These are identified using the list of PMB ICD10 codes published by the Council for Medical Schemes.
48. In-hospital claims are summarised at an overall level, and the beneficiary file contains only the number of admissions (number of hospital claims with unique, non-sequential dates) and the total in-hospital claims. In-hospital claims are analysed in detail using the admissions file.

Admissions file

49. The admissions file contains details about each hospital admission (as defined above), including details of the facility admitted to, the treating medical practitioners and the patient, as well as information about the diagnosis and procedure performed.

Patient information

50. A number of indicators are transferred from the beneficiary file outlined above to give insight into the demographic and clinical profiles of the patient. These are age, gender, medical scheme, medical scheme plan, the clinical profile and reporting status indicators as well as geographic location (currently a reference, but EA codes and catchment areas will be added once the geocoding process is complete and the results reviewed).

Medical practitioner information

51. As part of the admission file, information about the medical practitioners who have treated the patient is also recorded. The fields are as follows:

- 51.1. Treating discipline and medical practitioner, identified as the medical practitioner who has claimed the highest value over the duration of the admission, excluding anaesthetists;
- 51.2. Attending medical practitioners, up to a maximum of four, indicating which practices have claimed for the patient during the course of the admission;
- 51.3. Treating radiologist and pathologist, identified as the radiologist and pathologist with the highest value of claims for that patient during the admission.

Facility information

52. The treating facility, as well as its geographic location, is also identified. To the extent that a patient is transferred from one facility to another, the facility where higher values are claimed will be identified as the treating facility. 'Facility' in this instance refers to psychiatric hospitals, general hospitals, provincial hospitals and day clinics, and excludes sub-acute facilities and rehabilitation centres.

Admission information

53. Some information about the reason for and nature of the admission is also recorded as follows:
 - 53.1. Admission and discharge dates (the earliest and latest dates of hospital claims for that admissions) as well as a day admission flag (a day admission is where the admission and discharge dates are the same);
 - 53.2. Admission type indicator; 'Maternity' if the hospital tariff codes indicate a maternity ward, 'Surgical' if a theatre claim is recorded, else 'Medical';
 - 53.3. Number of days spent in day wards, general wards, high care ward, intensive care and maternity wards, as well as number of minutes spent in theatre;
 - 53.4. Diagnoses provided by the attending medical practitioners as well as the facilities separately, grouping using the CCS classification of ICD10 codes (to the extent multiple diagnosis groups are recorded the group with the highest claimed value is used);
 - 53.5. Procedure performed (if any), grouped using the medical practitioner tariff codes classified into the CCS procedure classification (again if there are multiple procedure groups the highest value group is used); and

53.6. Admission day (of the week).

Claim information

54. As with the out-of-hospital claims in the beneficiary file, the admission file claims have been grouped by discipline (using the hospital tariff codes where necessary), as follows:

54.1. Hospital ward fees;

54.2. Hospital theatre fees;

54.3. Hospital medicines, consumables and surgical items;

54.4. Hospital ARM codes (any per diem or global fee arrangements, as identified by the medical scheme administrators);

54.5. Other hospital claims;

54.6. General practitioners;

54.7. Specialists;

54.8. Anaesthetists;

54.9. Pathology;

54.10. Radiology;

54.11. Auxiliary claims; and

54.12. Other.

55. In addition, PMB claims have been identified in two ways, firstly by the CMS diagnosis codes as outlined above, and secondly by the PMB benefit indicator which the medical schemes were asked to provide.

Additional methodological considerations for descriptive statistics

56. When calculating the descriptive statistics, the following further definitions should be taken into account:

56.1. 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. This will mean that the numbers reflected in the results are higher than the numbers reported in the CMS annual reports.

- 56.2. Claim (or cost) 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 not be recorded and thus still be excluded.
- 56.3. 'Open' and 'Restricted' schemes are defined as in the CMS annual reports.
- 56.4. 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.
- 56.5. Where claims figures are summarised by an analysis variable, the definition will correspond to those used in the sections above and highlighted in bold.

INDUSTRY TRENDS AND STATISTICS

Demographic trends

57. Table 4 below shows the profile of the schemes included in the analysis dataset.

TABLE 4: ALL SCHEMES DEMOGRAPHIC TRENDS

| Year | Beneficiaries | Average Age | % Male |
|--------|---------------|-------------|--------|
| 2010 | 7 783 718 | 31.26 | 47.37% |
| 2011 | 8 068 616 | 31.38 | 47.37% |
| 2012 | 8 842 029 | 32.01 | 47.16% |
| 2013 | 9 209 614 | 32.29 | 47.18% |
| 2014 | 9 211 943 | 32.49 | 47.06% |
| Change | 18.35% | 1.23 | -0.31% |

58. The table shows that:

58.1. The numbers of beneficiaries analysed across the five year period have grown by 18.35% over the five year period. A significant proportion of this is because some schemes have only been able to supply data for later parts of the requested period, but there also is some genuine growth of the industry.

58.2. The average age of the lives analysed has increased by 1.23 years over the five-year period. This is similar to the figures reported in the CMS annual report, which shows a gradually increasing average age.

59. The figures for open and restricted schemes analysed are shown in the tables below:

TABLE 5: OPEN SCHEMES DEMOGRAPHIC TRENDS

| Year | Beneficiaries | Average Age | % Male |
|--------|---------------|-------------|--------|
| 2010 | 4 333 984 | 32.28 | 47.72% |
| 2011 | 4 341 007 | 32.56 | 48.02% |
| 2012 | 4 904 693 | 33.31 | 47.89% |
| 2013 | 5 107 377 | 33.60 | 48.04% |
| 2014 | 5 167 332 | 33.78 | 47.99% |
| Change | 19.23% | 1.50 | 0.27% |

TABLE 6: RESTRICTED SCHEMES DEMOGRAPHIC TRENDS

| Year | Beneficiaries | Average Age | % Male |
|--------|---------------|-------------|--------|
| 2010 | 3 449 734 | 29.99 | 46.92% |
| 2011 | 3 727 609 | 30.00 | 46.61% |
| 2012 | 3 937 336 | 30.38 | 46.26% |
| 2013 | 4 102 237 | 30.66 | 46.11% |
| 2014 | 4 044 611 | 30.84 | 45.86% |
| Change | 17.24% | 0.85 | -1.06% |

60. The tables show that:

- 60.1. The open schemes constitute about 60% of the dataset analysed, with restricted schemes contributing the other 40%;
- 60.2. The numbers of lives analysed in open schemes have grown by marginally more than restricted schemes over the period, which is likely a result of both partial data submissions and the continuing amalgamation of smaller restricted schemes into open schemes, offsetting the effect of the Government Employees Medical Scheme (GEMS) which has grown substantially in the past 10 years;
- 60.3.** The lives analysed who belong to open schemes have aged by more than those belonging to restricted schemes over the period, consistent with the hypothesis that GEMS is bringing previously uncovered younger members into the medical schemes system.

Overall claims trends

61. Table 7 below shows the overall cost trends for the schemes included in the dataset over the period. We note that no adjustments for risk or case mix have been performed and these figures represent an unadjusted trend.

TABLE 7: OVERALL COST TRENDS, ALL SCHEMES

| Cost Trends - All Schemes | 2011 | 2012 | 2013 | 2014 |
|--------------------------------|--------|--------|--------|--------|
| Total Cost Increase | 13.03% | 19.00% | 13.75% | 10.19% |
| Membership Change | 3.66% | 9.59% | 4.16% | 0.03% |
| Cost Increase per beneficiary | 9.04% | 8.59% | 9.21% | 10.16% |
| Utilisation | | | | |
| - Frequency (% claimers) | 1.32% | 0.13% | 1.17% | 1.11% |
| - Intensity (cost per claimer) | 2.50% | 2.70% | 2.13% | 2.68% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

62. Table 7 shows that, adjusted for changes in membership, claim costs have increased by between 8.59% and 10.16% a year over the last five years. This compares to a CPI of between 5.0% and 6.1%. This would suggest that medical scheme claims increases are at least 4% higher than CPI consistently. A contribution of around 1% to the 4% margin comes from utilisation frequency, i.e. more lives claiming than before, while the rest comes either from intensity (more services being used per claimer) or price increases above CPI. These trends will be explored further in later reports.

63. The tables for open and restricted schemes respectively are shown below, showing some differences by individual year, but very similar trends at an overall level:

TABLE 8: OVERALL COST TRENDS, OPEN SCHEMES

| Cost Trends - Open Schemes | 2011 | 2012 | 2013 | 2014 |
|-----------------------------------|-------------|-------------|-------------|-------------|
| Total Cost Increase | 10.17% | 19.79% | 15.90% | 11.11% |
| Membership Change | 0.16% | 12.99% | 4.13% | 1.17% |
| Cost Increase per beneficiary | 9.99% | 6.02% | 11.30% | 9.82% |
| Utilisation | | | | |
| - Frequency (% claimers) | 0.71% | -0.56% | 2.38% | 0.47% |
| - Intensity (cost per claimer) | 4.02% | 0.96% | 2.85% | 3.02% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

TABLE 9: OVERALL COST TRENDS, RESTRICTED SCHEMES

| Cost Trends – Restricted Schemes | 2011 | 2012 | 2013 | 2014 |
|---|-------------|-------------|-------------|-------------|
| Total Cost Increase | 16.95% | 17.98% | 10.93% | 8.92% |
| Membership Change | 8.05% | 5.63% | 4.19% | -1.40% |
| Cost Increase per beneficiary | 8.23% | 11.70% | 6.47% | 10.47% |
| Utilisation | | | | |
| - Frequency (% claimers) | 1.73% | 1.20% | -0.21% | 1.97% |
| - Intensity (cost per claimer) | 1.33% | 4.52% | 0.94% | 2.11% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

Out-of-hospital costs

64. The tables outlined above are repeated below considering only out-of-hospital costs. Again these figures have not been adjusted for risk profiles of the population changing over time.

TABLE 10: OUT-OF-HOSPITAL COST TRENDS, ALL SCHEMES

| OH Cost Trends - All Schemes | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-------------|-------------|-------------|-------------|
| Total Cost Increase | 11.55% | 15.33% | 11.43% | 9.36% |
| Membership Change | 3.66% | 9.59% | 4.16% | 0.03% |
| Cost Increase per beneficiary | 7.61% | 5.25% | 6.99% | 9.33% |
| Utilisation | | | | |
| - Frequency (% claimers) | 1.42% | 0.13% | 1.21% | 1.13% |
| - Intensity (cost per claimer) | 1.05% | -0.46% | 0.01% | 1.90% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

65. This table shows that the cost increase is smaller for out-of-hospital claims than the overall increase. This suggests a net cost shifting towards hospitals over time i.e. the proportion of total expenditure incurred in-hospital is increasing. The results by scheme type are again shown below, with similar overall trends (albeit with greater variability).

TABLE 11: OUT-OF-HOSPITAL COST TRENDS, OPEN SCHEMES

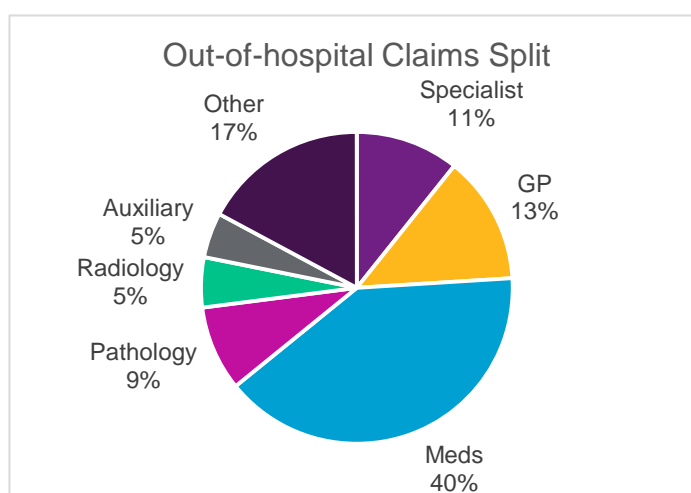
| OH Cost Trends - Open Schemes | 2011 | 2012 | 2013 | 2014 |
|--------------------------------------|-------------|-------------|-------------|-------------|
| Total Cost Increase | 8.91% | 15.24% | 14.18% | 9.72% |
| Membership Growth | 0.16% | 12.99% | 4.13% | 1.17% |
| Cost Increase per beneficiary | 8.74% | 1.99% | 9.65% | 8.45% |
| Utilisation | | | | |
| - Frequency (% claimers) | 0.82% | -0.56% | 2.44% | 0.49% |
| - Intensity (cost per claimer) | 2.72% | -2.88% | 1.26% | 1.71% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

TABLE 12: OUT-OF-HOSPITAL COST TRENDS, RESTRICTED SCHEMES

| OH Cost Trends - Restricted Schemes | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|--------|--------|--------|--------|
| Total Cost Increase | 14.96% | 15.45% | 8.08% | 8.89% |
| Membership Growth | 8.05% | 5.63% | 4.19% | -1.40% |
| Cost Increase per beneficiary | 6.39% | 9.30% | 3.73% | 10.44% |
| Utilisation | | | | |
| - Frequency (% claimers) | 1.78% | 1.21% | -0.19% | 1.98% |
| - Intensity (cost per claimer) | -0.45% | 2.27% | -1.68% | 2.07% |
| Price (CPI) | | | | |
| | 5.00% | 5.60% | 5.70% | 6.10% |

66. The proportion of out-of-hospital expenditure by each of the categories defined above is shown in the graph below. It shows that, as expected, medicines (we note that the medicines category here would include both acute and chronic medication claims) and medical practitioner services are the most prevalent categories, with auxiliary services and other claims forming a smaller proportion.

FIGURE 2: OUT-OF-HOSPITAL CLAIMS SPLIT, 2014 DATA



67. Table 13 shows, for all schemes, the average annual increase over the 5 year period in the cost per beneficiary, divided into the 18 groups defined by the Narrow Disease Burden indicator.

TABLE 13: OUT-OF-HOSPITAL CLAIMS INCREASES BY NARROW DISEASE BURDEN INDICATOR CATEGORY, 2010-14

| Average Annual Increase | Lives | Specialist | GP | Meds | Patholo | Radiology | Auxiliary | Other | Total OH |
|--------------------------|-------|------------|-------|-------|---------|-----------|-----------|--------|----------|
| Healthy ¹ | -1.4% | 9.91% | 8.06% | 7.98% | 13.14% | 10.71% | 9.00% | 4.96% | 8.01% |
| Acute Respiratory | 0.6% | 5.82% | 5.19% | 5.62% | 9.25% | 8.48% | 7.76% | 2.08% | 5.31% |
| Chronic Respiratory | -0.3% | 6.17% | 4.76% | 5.15% | 9.07% | 8.38% | 7.06% | 4.12% | 5.46% |
| Hypertension | 0.7% | 7.36% | 5.60% | 4.33% | 10.86% | 8.98% | 6.78% | 3.51% | 5.39% |
| Infections | -0.4% | 7.20% | 5.69% | 6.95% | 9.49% | 9.81% | 9.61% | 3.21% | 6.45% |
| Psychiatric | 0.2% | 6.93% | 4.15% | 4.68% | 7.51% | 7.37% | 6.25% | 4.52% | 5.19% |
| Diabetes | 0.3% | 8.15% | 3.96% | 4.15% | 12.54% | 9.28% | 4.67% | 2.73% | 5.18% |
| HIV | 0.4% | 1.27% | 5.08% | 2.45% | 7.21% | 8.27% | 13.43% | 2.01% | 3.86% |
| CNS Disorders | -0.1% | 7.69% | 5.47% | 5.24% | 10.08% | 7.12% | 7.19% | 5.86% | 6.20% |
| Back Problems | 0.0% | 5.61% | 5.74% | 4.47% | 8.68% | 5.50% | 4.88% | 1.17% | 4.68% |
| Arthritis | 0.0% | 7.52% | 5.62% | 7.11% | 9.15% | 8.32% | 6.21% | 2.57% | 6.43% |
| Cancer | 0.1% | 6.91% | 6.86% | 0.52% | 9.42% | 9.19% | 7.05% | 7.11% | 4.02% |
| Heart Conditions | 0.0% | 8.64% | 5.98% | 3.76% | 15.02% | 7.65% | 5.51% | 5.05% | 6.24% |
| Other Cardiovascular | -0.2% | 12.12% | 3.27% | 7.06% | 10.86% | 13.56% | 6.04% | 6.75% | 7.75% |
| Anaemia, Blood Disorders | 0.0% | 6.22% | 4.32% | 7.03% | 9.98% | 8.49% | 6.38% | 3.94% | 6.80% |
| Renal Failure | 0.0% | 4.36% | 7.50% | 0.48% | 5.83% | 5.13% | 1.03% | 3.12% | 3.70% |
| Congenital Conditions | 0.0% | 8.29% | 2.30% | 5.66% | 6.50% | 5.37% | 13.70% | 8.87% | 6.89% |
| Coma, Brain Damage, | 0.0% | 10.86% | 2.09% | 6.96% | 20.39% | -2.04% | 7.46% | 14.61% | 8.67% |
| All Lives | 0.0% | 9.07% | 6.58% | 6.83% | 12.38% | 10.12% | 8.20% | 4.56% | 7.27% |

68. The table shows that:

68.1. As outlined above, the out-of-hospital claims have increased annually by 7.27% on a membership adjusted basis;

¹ Beneficiaries that could not be allocated to a disease category, either due to the fact that they did not have a claims history or only had claims for trivial claims are categorised as 'Healthy'

- 68.2. The categories which show the highest annual increase are pathology (12.38%) and radiology (10.12%), followed by specialist services (9.07%);
 - 68.3. The disease profile of the population analysed does not appear to have shifted markedly over time, although some of the chronic diseases (hypertension and HIV notably) show an increasing prevalence; and
 - 68.4. It is noticeable that the highest annual increases are for the so called 'Healthy' i.e. unassigned lives.
69. Table 14 shows the same trends using the Broad Disease Burden indicator as opposed to the Narrow Disease Burden indicator:

TABLE 14: OUT-OF-HOSPITAL CLAIMS INCREASES BY BROAD DISEASE BURDEN INDICATOR

| Average | Annual Lives | Specialist | GP | Meds | Pathology | Radiology | Auxiliary | Other | Total OH |
|----------------------------|--------------|------------|-------|--------|-----------|-----------|-----------|--------|----------|
| Healthy | -3.5% | 7.63% | 7.03% | -4.56% | 6.92% | 12.09% | 7.92% | 4.18% | 3.19% |
| Hypertension + 1 | 0.2% | 6.44% | 5.08% | 4.48% | 8.06% | 7.74% | 6.39% | 4.52% | 5.37% |
| Acute Conditions | -0.7% | 3.91% | 5.06% | 2.13% | 4.66% | 6.87% | 5.05% | 2.25% | 3.33% |
| Chronic Respiratory + 2 | 0.0% | 5.43% | 5.14% | 6.25% | 8.81% | 7.23% | 5.73% | 1.33% | 4.64% |
| Other Chronic + 2 | 0.5% | 6.35% | 3.71% | 5.84% | 7.69% | 5.98% | 5.85% | 2.09% | 4.78% |
| Chronic Respiratory | -0.1% | 4.47% | 3.89% | 3.94% | 8.62% | 5.98% | 6.72% | 2.02% | 4.11% |
| Hyperlipidaemia + 1 | 0.1% | 6.25% | 6.15% | 0.62% | 7.09% | 7.73% | 2.99% | 2.09% | 3.19% |
| Other Cardiovascular | 0.0% | 10.81% | 5.89% | 8.55% | 19.76% | 8.02% | 5.42% | 3.84% | 9.52% |
| Other Chronic + 1 | 0.9% | 4.75% | 3.58% | 7.41% | 13.48% | 6.83% | 7.34% | 1.64% | 5.54% |
| HIV + 1 | -0.1% | 6.24% | 6.98% | -0.14% | 7.10% | 6.62% | 4.26% | 3.77% | 3.46% |
| Diabetes Mellitus | 0.0% | 6.56% | 4.50% | 3.67% | 12.51% | 8.64% | 5.30% | 0.42% | 4.41% |
| Psychiatric Conditions | 0.1% | 7.27% | 5.16% | 3.99% | 5.93% | 6.17% | 4.71% | 3.39% | 4.58% |
| Hyperlipidaemia + 2 | 0.1% | 6.07% | 5.28% | 1.55% | 10.90% | 6.69% | 4.89% | 1.76% | 3.68% |
| Chronic Respiratory + 1 | -0.1% | 5.41% | 3.69% | 4.99% | 12.02% | 7.25% | 6.88% | 4.00% | 5.14% |
| Other Chronic + 2 | 0.0% | 5.89% | 2.82% | 7.32% | 9.57% | 5.14% | 4.26% | 2.47% | 5.16% |
| Other Cardiovascular + 1 | 0.0% | 5.52% | 3.71% | 6.08% | 10.11% | 5.91% | 7.26% | 4.11% | 5.91% |
| Diabetes Mellitus + 1 | 0.1% | 6.11% | 4.63% | 1.99% | 9.23% | 9.14% | 1.51% | 2.04% | 3.49% |
| HIV + 2 | 0.0% | 4.91% | 5.92% | 0.52% | 7.48% | 5.92% | 1.95% | 2.71% | 2.91% |
| Psychiatric Conditions + 1 | 0.1% | 7.04% | 3.96% | 4.04% | 7.58% | 6.29% | 5.85% | 3.45% | 4.74% |
| Other Cardiovascular + 2 | 0.0% | 2.42% | 3.03% | 5.14% | 9.62% | 3.15% | 1.73% | -0.66% | 3.69% |
| High Cost Event | 0.8% | 3.82% | 4.81% | 1.25% | 8.96% | 6.68% | 8.33% | 1.14% | 3.29% |
| Psychiatric Conditions + 2 | 0.1% | 6.02% | 3.38% | 4.53% | 7.93% | 5.31% | 8.46% | 2.93% | 4.84% |
| Hypertension | -0.1% | 5.05% | 4.62% | 1.80% | 10.03% | 6.03% | 3.42% | 2.70% | 3.49% |
| Hyperlipidaemia | 0.0% | 4.06% | 4.52% | 1.11% | 6.11% | 5.53% | -0.38% | 1.43% | 2.32% |
| Diabetes Mellitus + 2 | 0.8% | 5.49% | 4.17% | 1.91% | 10.77% | 6.61% | 1.57% | 2.20% | 3.46% |
| HIV | -0.1% | 8.59% | 3.22% | 3.11% | 13.90% | 9.55% | 11.67% | 3.35% | 5.72% |
| Hypertension + 2 | 0.9% | 7.12% | 4.91% | 2.63% | 8.45% | 7.71% | 5.21% | 5.04% | 4.55% |
| All Lives | 0.0% | 9.07% | 6.58% | 6.83% | 12.38% | 10.12% | 8.20% | 4.56% | 7.27% |

70. Table 15 shows the same trends, but splits beneficiaries by the medical practitioner usage and multiple medical practitioner variables:

TABLE 15: OUT-OF-HOSPITAL CLAIMS TRENDS BY MEDICAL PRACTITIONER USAGE, 2010-14

| Annual Increase | Lives | Specialis | GP | Meds | Pathology | Radiology | Auxiliary | Other | Total OH |
|--------------------------|-------|-----------|-------|-------|-----------|-----------|-----------|-------|----------|
| No medical practitioners | -2.4% | | | 7.81% | 12.22% | 12.17% | 9.41% | 5.78% | 7.42% |
| GPs only | | | | | | | | | |
| - single | 1.5% | | 5.72% | 6.67% | 11.73% | 9.55% | 8.13% | 3.04% | 6.05% |
| - multiple | 0.1% | | 4.84% | 6.94% | 11.26% | 12.00% | 14.45% | 2.51% | 6.26% |
| Specialists only | | | | | | | | | |
| - single | 0.0% | 8.33% | | 5.43% | 13.79% | 9.99% | 6.63% | 5.39% | 7.50% |
| - multiple | 0.0% | 19.47% | | 9.14% | 12.31% | 21.74% | 8.30% | 7.94% | 13.38% |
| GPs and Specialists | | | | | | | | | |
| - single | 0.7% | 7.84% | 6.01% | 5.49% | 10.95% | 8.65% | 5.78% | 4.31% | 6.45% |
| - multiple | 0.0% | 9.97% | 5.78% | 5.97% | 10.92% | 10.21% | 9.47% | 5.17% | 7.39% |
| All Lives | 0.0% | 9.06% | 6.58% | 6.83% | 12.38% | 10.12% | 8.20% | 4.56% | 7.27% |

71. Table 15 shows that:

- 71.1. The key drivers at an overall level remain the same as above (since the population is the same); but
- 71.2. Those beneficiaries visiting only specialists show higher cost increases than the remaining beneficiaries, with the group visiting multiple specialists showing the highest increases of all, noting again that the figures in the table have not been adjusted for any changes in clinical or demographic risk profiles;
- 71.3. It is noted that fewer beneficiaries are falling into the 'no medical practitioners' category. This implies that over time larger proportions of the population are being managed by and/or accessing the services of medical practitioners.

In-hospital costs

72. The tables outlined in the previous sub-section are repeated below considering only in-hospital costs. Again these figures have not been adjusted for risk profiles of the population changing over time.

TABLE 16: IN-HOSPITAL COST TRENDS, ALL SCHEMES

| IH Cost Trends - All Schemes | 2011 | 2012 | 2013 | 2014 |
|--------------------------------|--------|--------|--------|--------|
| Total Cost Increase | 14.30% | 22.07% | 15.58% | 10.82% |
| Membership Growth | 3.66% | 9.59% | 4.16% | 0.03% |
| Cost Increase per beneficiary | 10.27% | 11.40% | 10.97% | 10.79% |
| Utilisation | | | | |
| - Frequency (% claimers) | 1.91% | 1.97% | 2.50% | 2.37% |
| - Intensity (cost per claimer) | 3.05% | 3.45% | 2.42% | 2.01% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

73. Table 16 shows that the cost increase is higher for in-hospital claims than the overall increase, with increases over 10% in all the years covered. This again suggests a cost shifting towards hospitalisation over time. The results by scheme type are again shown below, with similar overall trends (albeit with greater variability).

TABLE 17: IN-HOSPITAL COST TRENDS, OPEN SCHEMES

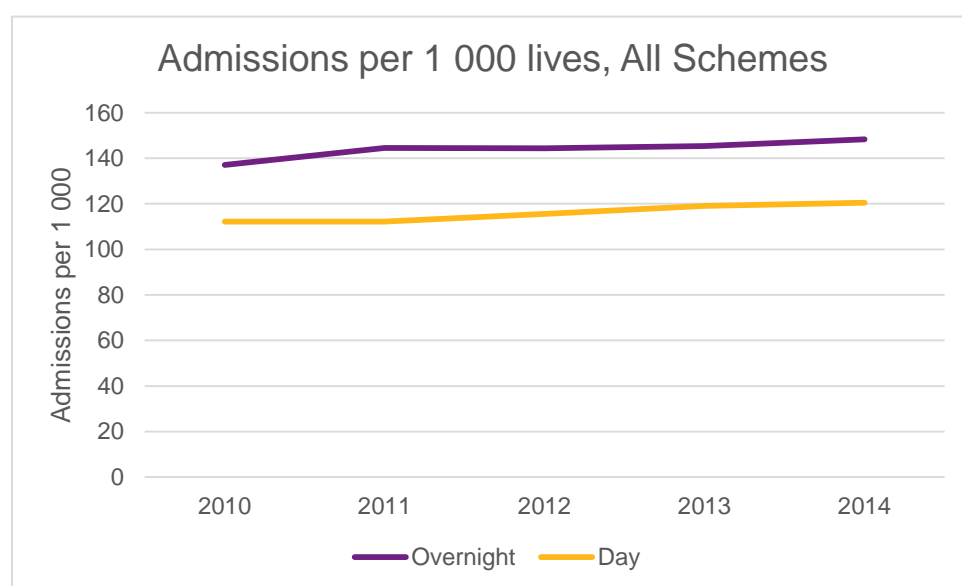
| IH Cost Trends - Open Schemes | 2011 | 2012 | 2013 | 2014 |
|--------------------------------|--------|--------|--------|--------|
| Total Cost Increase | 11.20% | 23.45% | 17.19% | 12.13% |
| Membership Growth | 0.16% | 12.99% | 4.13% | 1.17% |
| Cost Increase per beneficiary | 11.02% | 9.26% | 12.54% | 10.83% |
| Utilisation | | | | |
| - Frequency (% claimers) | 1.54% | 0.52% | 3.92% | 2.19% |
| - Intensity (cost per claimer) | 4.13% | 2.93% | 2.46% | 2.22% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

TABLE 18: IN-HOSPITAL COST TRENDS, RESTRICTED SCHEMES

| IH Cost Trends – Restricted Schemes | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|--------|--------|--------|--------|
| Total Cost Increase | 18.77% | 20.22% | 13.36% | 8.94% |
| Membership Growth | 8.05% | 5.63% | 4.19% | -1.40% |
| Cost Increase per beneficiary | 9.92% | 13.81% | 8.80% | 10.49% |
| Utilisation | | | | |
| - Frequency (% claimers) | 2.39% | 3.76% | 0.79% | 2.60% |
| - Intensity (cost per claimer) | 2.24% | 3.87% | 2.13% | 1.51% |
| Price (CPI) | 5.00% | 5.60% | 5.70% | 6.10% |

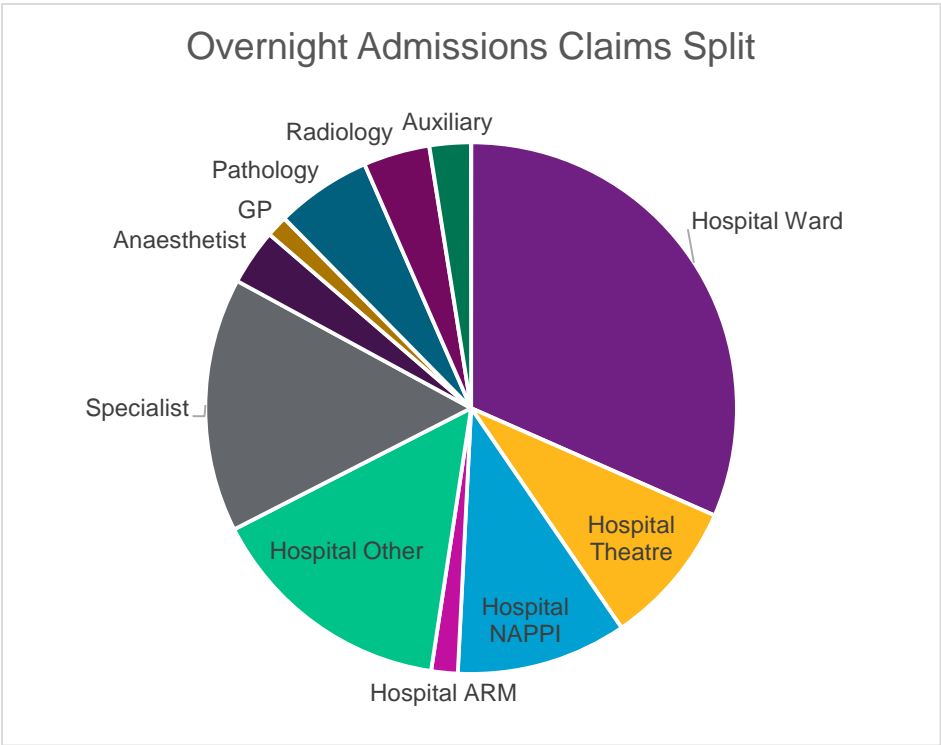
74. All of the tables show increased utilisation frequency for in-hospital services i.e. more beneficiaries being admitted over time. The graph below shows the trends in admission rates (per 1 000 lives) over time. Again these figures have not been adjusted for risk profile changes.

FIGURE 3: ADMISSIONS TRENDS, ALL SCHEMES



- 75. The graph shows constantly increasing admission rates over time, consistent with the results outlined in the overall analysis above. The trend appears to be across both day admissions and overnight stay admissions, suggesting a systemic shift towards in-hospital care as opposed to specific issues. The trend will be analysed further and results reported on in later reports.
- 76. Figure 4 shows the claims split across various expenditure categories for all overnight stay admissions in 2014.

FIGURE 4: OVERNIGHT ADMISSIONS CLAIMS SPLIT 2014



- 77. The next set of tables shows the most common treating disciplines, diagnoses and procedures for overnight admissions. The intention is to provide high level insights into the admission profile as opposed to any detailed analysis or conclusions, which will be addressed in later reports. Table 19 shows the top ten specialist disciplines who are admitting patients overnight.

TABLE 19: TOP ADMITTING DISCIPLINES, 2010-14

| Discipline Name | % of Admissions | | | | |
|------------------------|-----------------|--------|--------|--------|--------|
| | 2010 | 2011 | 2012 | 2013 | 2014 |
| Physicians | 16.95% | 17.53% | 18.26% | 19.31% | 19.73% |
| Gynaecologists | 14.60% | 14.22% | 14.01% | 13.61% | 13.43% |
| Surgeons | 12.65% | 12.82% | 12.90% | 12.93% | 12.97% |
| General Practitioners | 13.20% | 12.90% | 12.68% | 12.23% | 11.82% |
| Paediatricians | 11.27% | 11.08% | 10.66% | 10.81% | 10.74% |
| Orthopaedic Surgeons | 9.02% | 9.15% | 9.29% | 9.32% | 9.50% |
| Psychiatrists | 4.05% | 4.08% | 4.13% | 4.16% | 4.16% |
| Urologists | 3.64% | 3.83% | 3.88% | 3.81% | 3.92% |
| Otorhinolaryngologists | 2.41% | 2.62% | 2.48% | 2.23% | 2.19% |
| Cardiologists | 2.18% | 2.13% | 2.18% | 2.14% | 2.12% |
| Other Disciplines | 10.02% | 9.64% | 9.53% | 9.45% | 9.41% |

78. Table 19 confirms that the generalist disciplines, as well as gynaecologists, are the most common admitting practitioners. The next table shows the most common diagnoses for which patients are being admitted overnight noting that the diagnoses were derived from ICD diagnosis code provided by the treating practitioner.

TABLE 20: TOP DIAGNOSES: 2010 - 2014

| Diagnosis | % of Admissions | | | | |
|-------------------------|-----------------|--------|--------|--------|--------|
| | 2010 | 2011 | 2012 | 2013 | 2014 |
| Trauma | 7.36% | 7.08% | 7.37% | 9.09% | 9.97% |
| Uncomplicated Maternity | 6.56% | 7.13% | 7.81% | 8.10% | 8.28% |
| Non-Specific | 7.28% | 7.63% | 8.16% | 8.17% | 8.03% |
| Pneumonia | 6.23% | 6.86% | 7.33% | 7.56% | 7.85% |
| Heart Conditions | 5.36% | 5.94% | 6.15% | 6.55% | 6.44% |
| Psychiatric | 4.48% | 4.96% | 5.81% | 6.19% | 6.29% |
| Complicated Maternity | 4.25% | 4.64% | 5.18% | 5.46% | 5.59% |
| Cancer | 3.94% | 4.40% | 4.91% | 5.30% | 5.57% |
| Bronchitis | 3.31% | 3.64% | 3.97% | 4.20% | 4.46% |
| Chronic Respiratory | 3.08% | 3.48% | 3.65% | 3.95% | 3.99% |
| Other Diagnoses | 48.16% | 44.23% | 39.66% | 35.42% | 33.53% |

79. We note that maternity, trauma and respiratory conditions very prevalent. The high proportion of non-specific diagnoses is also noted, which is a potential indication that the ICD10 coding is not as accurate and/or as detailed as it should be, or that detail is being lost during one or more of the various stages of claims submission and processing within the schemes' administration systems.
80. The final table shows the most common procedures performed by the treating practitioners. The procedures were identified from the tariff code submitted by the treating practitioner. In the instances where only hospital visits were claimed for without an accompanying procedure/intervention the event was classified as "No Procedure".

TABLE 21: TOP PROCEDURES: 2010 - 2014

| Procedure | % of Admissions | | | | |
|---------------------------|-----------------|--------|--------|--------|--------|
| | 2010 | 2011 | 2012 | 2013 | 2014 |
| No Procedure | 28.36% | 30.77% | 34.10% | 37.28% | 39.60% |
| Non-Specific ¹ | 11.07% | 11.95% | 13.04% | 13.25% | 12.54% |
| Caesarean Section | 6.57% | 6.90% | 7.56% | 7.68% | 7.76% |
| ICU Care | 4.80% | 5.10% | 5.64% | 6.17% | 6.27% |
| Psychiatric | 4.54% | 4.99% | 5.55% | 5.94% | 6.06% |
| Normal Delivery | 2.68% | 2.80% | 2.87% | 2.86% | 2.76% |
| Upper GI Endoscopy | 2.14% | 2.38% | 2.60% | 2.65% | 2.70% |
| Joint Replacements | 1.61% | 1.79% | 1.95% | 2.05% | 2.19% |
| Colonoscopy | 1.43% | 1.85% | 2.07% | 2.00% | 2.09% |
| Fractures/Dislocations | 1.22% | 1.36% | 1.51% | 1.61% | 1.69% |
| Other Procedures | 35.58% | 30.11% | 23.12% | 18.53% | 16.34% |

81. We again note the high proportion of non-specific procedures suggests some issues with the coding systems being used.

¹ Non-specific procedures represent a group of relatively trivial and/or diagnostic procedures, for example intravenous infusions and acupuncture

CONCLUSION

82. The dataset being used is likely the most comprehensive that has ever been compiled for the South African medical scheme industry, with coverage of over 90% in 2014;
83. The data suggests claim costs have increased by more than 4% above CPI, driven in a large part by in-hospital costs; and
84. Further detailed analyses will be provided in future reports which attempt to unpack some of the trends outlined in this report.

Appendix A: Member Data Comparison

| Scheme Name | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|------|------|------|------|------|
| AECI Medical Aid Society | 100% | 100% | 100% | 102% | 100% |
| Afrisam SA Medical Scheme | 42% | | | | |
| Altron Medical Aid Scheme | 100% | 100% | 100% | 100% | |
| Anglo Medical Scheme | 321% | 322% | 322% | 311% | 100% |
| Anglovaal Group Medical Scheme | 100% | 100% | 100% | 100% | 100% |
| Bankmed | 97% | 98% | 98% | 98% | 98% |
| Barloworld Medical Scheme | 100% | 100% | 100% | 100% | 100% |
| Bestmed Medical Scheme | 129% | 128% | 128% | 124% | 122% |
| BMW Employees Medical Aid Society | | | | | 100% |
| Bonitas Medical Fund | 100% | 100% | 100% | 100% | 100% |
| BP Medical Aid Society | 98% | 99% | 99% | 99% | 98% |
| Chartered Accountants (SA) Medical Aid Fund (CAMAF) | 100% | 100% | 100% | 100% | 100% |
| Cape Medical Plan | 100% | 100% | 100% | 98% | 99% |
| De Beers Benefit Society | 99% | 100% | 101% | 101% | 101% |
| Discovery Health Medical Scheme | 100% | 100% | 100% | 100% | 100% |
| Edcon Medical Aid Scheme | 100% | 100% | | | |
| Engen Medical Benefit Fund | 99% | 99% | 99% | 99% | 98% |
| Fedhealth Medical Scheme | 99% | 99% | 99% | 99% | 99% |
| Fishing Industry Medical Scheme (Fishmed) | 93% | 96% | 97% | 98% | 98% |
| Food Workers Medical Benefit Fund | 98% | 106% | 103% | 103% | 105% |
| Government Employees Medical Scheme (GEMS) | 100% | 100% | 99% | 100% | 100% |
| Glencore Medical Scheme | | | | | 101% |
| Golden Arrow Employees' Medical Benefit Fund | 99% | 99% | 99% | 100% | 100% |
| Horizon Medical Scheme | 100% | 100% | 100% | 100% | 100% |
| IBM (SA) Medical Scheme | 101% | 101% | 102% | 52% | |
| Impala Medical Plan | | | 57% | 55% | 52% |
| Imperial Group Medical Scheme | 98% | 99% | 100% | 100% | 100% |

| Scheme Name | 2010 | 2011 | 2012 | 2013 | 2014 |
|--|------|------|------|------|------|
| KeyHealth | | | | 100% | 100% |
| LA-Health Medical Scheme | 99% | 99% | 99% | 99% | 99% |
| Libcare Medical Scheme | 100% | 100% | 101% | 100% | 100% |
| Liberty Medical Scheme | 99% | 99% | 99% | 99% | 100% |
| Lonmin Medical Scheme | 101% | 103% | 100% | 100% | 100% |
| Malcor Medical Scheme | | | | | |
| MBMed Medical Aid Fund | 100% | 100% | 100% | 100% | 101% |
| Medihelp | | | 100% | 100% | 100% |
| Medipos Medical Scheme | 98% | 98% | 99% | 99% | 99% |
| Medshield Medical Scheme | 137% | 100% | 100% | 100% | 100% |
| Metropolitan Medical Scheme | 93% | 93% | 94% | 96% | 94% |
| Momentum Health | 103% | 95% | 96% | 96% | 97% |
| Motohealth Care | 95% | 95% | 96% | 97% | 99% |
| Naspers Medical Fund | 41% | 101% | 100% | 100% | 100% |
| Nedgroup Medical Aid Scheme | 99% | 100% | 100% | 100% | 100% |
| Netcare Medical Scheme | 99% | 100% | 100% | 102% | 100% |
| Old Mutual Staff Medical Aid Fund | 99% | 100% | 100% | 100% | 100% |
| PG Group Medical Scheme | 100% | 100% | | | |
| Pick n Pay Medical Scheme | 99% | 99% | 99% | 100% | 100% |
| South African Police Service Medical Scheme (POLMED) | 96% | 96% | 97% | 97% | 97% |
| Profmed | | | | 93% | 93% |
| Quantum Medical Aid Society | 100% | 100% | 100% | 100% | 100% |
| Rand Water Medical Scheme | 99% | 98% | 98% | 98% | 98% |
| Remedi Medical Aid Scheme | 100% | 100% | 100% | 100% | 100% |
| Resolution Health Medical Scheme | | | 113% | 100% | 101% |
| Retail Medical Scheme | 102% | 101% | 102% | 101% | 101% |
| South African Breweries Medical Aid Scheme (SABMAS) | 98% | 98% | 99% | 99% | 100% |
| SABC Medical Aid Scheme | 100% | 100% | 100% | 100% | 100% |

| Scheme Name | 2010 | 2011 | 2012 | 2013 | 2014 |
|--|------|------|------|------|------|
| SAMWUMED | 40% | 40% | 41% | 43% | 44% |
| Sasolmed | 100% | 100% | 100% | 100% | 101% |
| Sedmed | | | 100% | | 100% |
| Selfmed Medical Scheme | | | 398% | 419% | 447% |
| Spectramed | | | 102% | 103% | 103% |
| Suremed Health | 58% | 64% | 65% | 39% | 41% |
| TFG Medical Aid Scheme | | | 100% | 100% | 100% |
| Thebemed | 91% | 103% | 105% | 108% | 108% |
| Transmed Medical Fund | 98% | 98% | 98% | 97% | 97% |
| Tsogo Sun Group Medical Scheme | 100% | 100% | 100% | 100% | 100% |
| Umed | 58% | | | | |
| Umvuzo Health Medical Scheme | 94% | 97% | 99% | 100% | 102% |
| University of Kwa-Zulu Natal Medical Scheme | 100% | 99% | 99% | 99% | 99% |
| Witbank Coalfields Medical Aid Scheme | | 70% | 72% | 72% | 72% |
| University of the Witwatersrand Staff Medical Aid Scheme | 100% | 100% | 100% | 100% | 100% |
| Wooltru Healthcare Fund | 98% | 98% | 99% | 99% | 99% |

Appendix B: Claims Data Comparison

| Scheme Name | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|------|------|------|------|------|
| AECI Medical Aid Society | 91% | 94% | 94% | 89% | 91% |
| Afrisam SA Medical Scheme | 102% | | | | |
| Altron Medical Aid Scheme | 96% | 102% | 92% | 98% | |
| Anglo Medical Scheme | 233% | 230% | 233% | 222% | 94% |
| Anglovaal Group Medical Scheme | 99% | 100% | 99% | 101% | 98% |
| Bankmed | 94% | 95% | 94% | 90% | 90% |
| Barloworld Medical Scheme | 98% | 99% | 98% | 100% | 97% |
| Bestmed Medical Scheme | 94% | 95% | 96% | 95% | 95% |
| BMW Employees Medical Aid Society | | | | | 100% |
| Bonitas Medical Fund | 85% | 85% | 84% | 91% | 91% |
| BP Medical Aid Society | 95% | 94% | 95% | 96% | 97% |
| Chartered Accountants (SA) Medical Aid Fund (CAMAF) | 111% | 109% | 109% | 107% | 108% |
| Cape Medical Plan | 100% | 99% | 100% | 100% | 100% |
| De Beers Benefit Society | 109% | 109% | 107% | 108% | 107% |
| Discovery Health Medical Scheme | 100% | 101% | 100% | 100% | 99% |
| Edcon Medical Aid Scheme | 98% | 101% | | | |
| Engen Medical Benefit Fund | 96% | 96% | 95% | 96% | 96% |
| Fedhealth Medical Scheme | 99% | 99% | 99% | 99% | 99% |
| Fishing Industry Medical Scheme (Fishmed) | 87% | 86% | 81% | 88% | 87% |
| Food Workers Medical Benefit Fund | 7% | 46% | 47% | 68% | 75% |
| Government Employees Medical Scheme (GEMS) | 99% | 100% | 100% | 100% | 100% |
| Glencore Medical Scheme | | | | | 99% |
| Golden Arrow Employees' Medical Benefit Fund | 94% | 91% | 97% | 99% | 94% |
| Horizon Medical Scheme | | 83% | 79% | 80% | 81% |
| IBM (SA) Medical Scheme | 101% | 100% | 101% | 102% | 0% |

| Scheme Name | 2010 | 2011 | 2012 | 2013 | 2014 |
|--|------|------|------|------|------|
| Impala Medical Plan | | | 47% | 47% | 46% |
| Imperial Group Medical Scheme | 97% | 97% | 97% | 99% | 97% |
| KeyHealth | | | | 98% | 98% |
| LA-Health Medical Scheme | 99% | 100% | 100% | 101% | 99% |
| Libcare Medical Scheme | 99% | 100% | 101% | 100% | 99% |
| Liberty Medical Scheme | 90% | 87% | 90% | 92% | 91% |
| Lonmin Medical Scheme | 51% | 46% | 53% | 53% | 57% |
| Malcor Medical Scheme | | | | | |
| MBMed Medical Aid Fund | 92% | 92% | 93% | 92% | 92% |
| Medihelp | | | 91% | 93% | 91% |
| Medipos Medical Scheme | 99% | 95% | 96% | 98% | 98% |
| Medshield Medical Scheme | 137% | 99% | 100% | 100% | 99% |
| Metropolitan Medical Scheme | 96% | 97% | 97% | 97% | 97% |
| Momentum Health | 98% | 95% | 96% | 94% | 94% |
| Motohealth Care | 91% | 93% | 92% | 92% | 91% |
| Naspers Medical Fund | 36% | 100% | 101% | 95% | 101% |
| Nedgroup Medical Aid Scheme | 89% | 84% | 83% | 85% | 86% |
| Netcare Medical Scheme | 99% | 101% | 98% | 100% | 99% |
| Old Mutual Staff Medical Aid Fund | 99% | 98% | 98% | 98% | 98% |
| PG Group Medical Scheme | 90% | 87% | | | |
| Pick n Pay Medical Scheme | 91% | 93% | 90% | 92% | 91% |
| South African Police Service Medical Scheme (POLMED) | 93% | 95% | 94% | 95% | 94% |
| Profmed | | | | 94% | 96% |
| Quantum Medical Aid Society | 96% | 99% | 99% | 96% | 101% |
| Rand Water Medical Scheme | 95% | 96% | 96% | 99% | 99% |
| Remedi Medical Aid Scheme | 97% | 96% | 96% | 96% | 95% |
| Resolution Health Medical Scheme | | 95% | 97% | 97% | 100% |

| Scheme Name | 2010 | 2011 | 2012 | 2013 | 2014 |
|--|------|------|------|------|------|
| Retail Medical Scheme | 100% | 100% | 101% | 99% | 101% |
| South African Breweries Medical Aid Scheme (SABMAS) | 100% | 100% | 99% | 98% | 100% |
| SABC Medical Aid Scheme | 98% | 99% | 98% | 98% | 97% |
| SAMWUMED | 59% | 57% | 59% | 60% | 61% |
| Sasolmed | 98% | 99% | 99% | 100% | 99% |
| Sedmed | | | 96% | | 99% |
| Selfmed Medical Scheme | | | 87% | 88% | 98% |
| Spectramed | | | 111% | 114% | 117% |
| Suremed Health | 65% | 61% | 61% | 38% | 41% |
| TFG Medical Aid Scheme | | | 101% | 100% | 100% |
| Thebemed | 91% | 94% | 91% | 89% | 93% |
| Transmed Medical Fund | 91% | 92% | 92% | 92% | 92% |
| Tsogo Sun Group Medical Scheme | 101% | 98% | 100% | 100% | 98% |
| Umed | 75% | | | | |
| Umvuzo Health Medical Scheme | 62% | 65% | 71% | 72% | 73% |
| University of Kwa-Zulu Natal Medical Scheme | 99% | 100% | 99% | 100% | 101% |
| Witbank Coalfields Medical Aid Scheme | | 33% | 63% | 62% | 63% |
| University of the Witwatersrand Staff Medical Aid Scheme | 100% | 97% | 98% | 98% | 97% |
| Wooltru Healthcare Fund | 91% | 92% | 92% | 93% | 94% |