
Research and Monitoring Unit

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## Contents

Executive summary .......................................................................................................................... 1

1 Introduction ................................................................................................................................... 3

2 Literature Review .......................................................................................................................... 5

  2.1 Chronic Respiratory Conditions ............................................................................................... 5

  2.2 Cardiovascular conditions ......................................................................................................... 5

  2.3 Chronic Renal Disease ............................................................................................................... 6

  2.4 Gastrointestinal Disorders ....................................................................................................... 6

  2.5 Diabetes Mellitus ...................................................................................................................... 7

  2.6 Psychiatric Conditions .............................................................................................................. 7

  2.7 Neurological Disorders ........................................................................................................... 7

  2.8 Auto-immune Conditions ......................................................................................................... 7

  2.9 Addison's Disease .................................................................................................................... 8

  2.10 Diabetes Insipidus .................................................................................................................... 8

  2.11 Glaucoma ............................................................................................................................... 8

  2.12 Haemophilia ............................................................................................................................ 8

  2.13 Hyperlipidaemia ...................................................................................................................... 8

  2.14 Parkinson's disease .................................................................................................................. 8

  2.15 Hypothyroidism ....................................................................................................................... 8

3 Study objective ............................................................................................................................. 9

4 Methodology .................................................................................................................................. 9

  4.1 Study Population ......................................................................................................................... 9

  4.2 Data ............................................................................................................................................ 9

  4.3 Data management and analysis ................................................................................................. 10

5 Results: Trends of chronic conditions ......................................................................................... 11

  5.1 Chronic respiratory conditions ................................................................................................. 11

  5.2 Cardiovascular conditions ......................................................................................................... 14

  5.3 Chronic renal disease ............................................................................................................... 17

  5.4 Gastrointestinal disorders ........................................................................................................ 18

  5.5 Diabetes mellitus ....................................................................................................................... 20

  5.6 Psychiatric conditions ................................................................................................................. 22

  5.7 Neurological disorders .............................................................................................................. 24

  5.8 Auto-immune Conditions ......................................................................................................... 25

  5.9 Addison's disease ...................................................................................................................... 27

  5.10 Diabetes Insipidus ..................................................................................................................... 28

  5.11 Glaucoma ................................................................................................................................ 29
List of Figures

Figure 1: Age profile of the medical aid schemes beneficiaries. .................................................................10
Figure 2: Overall prevalence of treated asthma, bronchiectasis and COPD by gender. ................................11
Figure 3: Treated Asthma by Age ..............................................................................................................12
Figure 4: Treated COPD by age ................................................................................................................13
Figure 5: Treated Bronchiectasis by Age ....................................................................................................13
Figure 6: Overall prevalence of cardiovascular conditions by gender. .........................................................14
Figure 7: Treated prevalence of Cardiomyopathy .......................................................................................15
Figure 8: Treated prevalence of Coronary artery diseases .........................................................................15
Figure 9: Treated prevalence of Dysrhythmias ............................................................................................16
Figure 10: Prevalence of treated Hypertension ............................................................................................16
Figure 11: Overall prevalence of Chronic Renal Disease by gender ..............................................................17
Figure 12: Treated prevalence of Chronic Renal Disease ............................................................................17
Figure 13: Overall prevalence of Gastrointestinal Conditions by gender ....................................................18
Figure 14: Treated prevalence of Crohn's Disease by Age ..........................................................................19
Figure 15: Treated prevalence of Ulcerative Colitis by Age ........................................................................19
Figure 16: Overall prevalence of Diabetes Mellitus by gender ...................................................................20
Figure 17: Treated prevalence of Diabetes Mellitus 1 by Age ....................................................................21
Figure 18: Treated prevalence of Diabetes Mellitus 2 by Age ....................................................................21
Figure 19: Overall prevalence of psychiatric disorders by gender ..............................................................22
Figure 20: Treated prevalence of Bipolar Mood Disorder by Age ...............................................................23
Figure 21: Treated prevalence of Schizophrenia by Age ............................................................................23
Figure 22: Overall prevalence of Neurological Disorders by gender ...........................................................24
Figure 23: Prevalence of treated epilepsy by age .........................................................................................24
Figure 24: Treated prevalence of Multiple Sclerosis by Age ......................................................................25
Figure 25: Overall prevalence of Auto-immune Conditions by gender .......................................................26
Figure 26: Treated prevalence of Rheumatoid Arthritis by Age ..................................................................26
Figure 27: Treated prevalence of Systemic Lupus Erythematosus by gender ..............................................27
Figure 28: Overall prevalence of Addison's disease by gender .................................................................27
Figure 29: Treated prevalence of Addison's Disease by Age .....................................................................28
Figure 30: Overall prevalence of Diabetes Insipidus by gender .................................................................28
Figure 31: Treated prevalence of Diabetes Insipidus by Age .....................................................................29
Figure 32: Overall prevalence of Glaucoma by gender ..............................................................................29
Figure 33: Treated prevalence of Glaucoma by Age ..................................................................................30
Figure 34: Overall prevalence of Haemophilia by gender .........................................................................30
Figure 35: Treated prevalence of Haemophilia by Age ..............................................................................31
Figure 36: Overall prevalence of Hyperlipidaemia by gender ....................................................................32
Figure 37: Treated prevalence of Hyperlipidaemia by Age .......................................................................32
Figure 38: Overall prevalence of Parkinson's disease by gender ...............................................................33
Figure 39: Treated prevalence of Parkinson's disease by Age ....................................................................33
Figure 40: Overall prevalence of Hypothyroidism by gender ....................................................................34
Figure 41: Treated prevalence of Hypothyroidism by Age .......................................................................34
Executive summary

Research and Monitoring conducted a trend analysis study on chronic diseases in the private healthcare sector for the period 2006 – 2011. The study design was a retrospective review of the Scheme Risk Measurement prevalence database.

The top 10 conditions that showed the fastest increase in the period 2006 – 2011, in order of their prevalence from highest to lowest in 2011 were hypertension, hyperlipidaemia, diabetes mellitus type 2, hypothyroidism, glaucoma, rheumatoid arthritis, bipolar mood disorder, Parkinson's disease, chronic renal disease, and systemic lupus Erythematosus.

The prevalence of hypertension grew by 36.8% between 2006 and 2011, from 57.6 to 78.8 per 1 000 beneficiaries, making it the fastest increasing cardiovascular disease among medical scheme beneficiaries and the most prevalent chronic disease on the PMB Chronic Disease List (CDL).

Hyperlipidaemia’s prevalence among beneficiaries grew by 37.7% from 23.9 in 1 000 beneficiaries in 2006 to 23.9 in 1 000 beneficiaries in 2011. This is most likely due to lifestyle changes.

The 84.2% increase in the prevalence of diabetes mellitus type 2 between 2006 and 2011 again points to the importance of leading a healthy lifestyle.

Over six time more females than male beneficiaries were treated for hypothyroidism between 2006 and 2011. The overall prevalence of the disease increased from 9.7 to 13.7 per 1 000 beneficiaries in that period. The prevalence in female beneficiaries increased by 37.5%, from 16.5 per 1 000 in 2006 to 22.6 per 1 000 in 2011. The prevalence of hypothyroidism among male beneficiaries increased at a faster rate, from 2.3 per 1 000 in 2006 to 3.8 per 1 000 in 2011, an increase of 63.2%.

The prevalence of glaucoma increased from 1.8 per 1 000 beneficiaries in 2006 to 2.7 per 1 000 in 2011. No significant gender-related difference in prevalence was observed.

Rheumatoid arthritis prevalence increased from 2.0 per 1 000 beneficiaries in 2006 to 2.6 per 1 000 beneficiaries in 2011, an increase of 31.7%. More female than male beneficiaries were treated for the disease during that period. The prevalence of rheumatoid arthritis among female beneficiaries increased from 2.8 to 3.8 per 1 000 in 200 – 2011, compared to a change from 1.1 to 1.4 per 1 000 in male beneficiaries during the same period.
The prevalence of bipolar mood disorder (BMD) among medical schemes beneficiaries more than doubled between 2006 and 2011. The psychiatric condition showed an increase of a staggering 250.0% during the period covered by the study. Very few beneficiaries under the age of 14 years were treated for BMD, but the prevalence of BMD among female beneficiaries 15 – 39 years increased from 1.0 per 1 000 in 2006 to 2.9 per 1 000 in 2011. Similar trends were observed in the older age groups (above 40 years).

Parkinson’s disease prevalence increased by 47.2% between 2006 and 2011, from 0.5 to 0.8 per 1 000 beneficiaries. Prevalence of the disease among beneficiaries between the ages of 60 and 79 years increased from 3.9 to 4.4 per 1 000 in the same period; the prevalence was higher in beneficiaries older than 80 years, increasing from 11.0 per 1 000 in 2006 to 12.2 per 1000 in 2011.

The prevalence of chronic renal disease increased from 0.2 per 1 000 in 2006 to 0.3 per 1 000 beneficiaries in 2011, an increase of 47.6%. More male than female beneficiaries were treated for the disease, in 2011, its prevalence was 0.4 per 1 000 male and 0.3 per 1 000 female beneficiaries.

The prevalence of systemic lupus erythematosus (SLE) increased from 0.16 per 1 000 beneficiaries in 2006 to 0.22 per 1 000 beneficiaries in 2011. The prevalence of SLE is high in women than in men. There were seven times more women than men treated for SLE in 2011.

Without aggressive intervention into the root causes of these chronic diseases and their costs, these trends are expected to continue to worsen.
1 Introduction

It is well established that non-communicable diseases (NCDs) or chronic diseases are the leading cause of death in the world; with 36 million or 63% of the 57 million deaths that occurred in the world during 2008 attributable to such diseases. Cardiovascular diseases, diabetes, cancer and chronic respiratory diseases caused the majority of these deaths.

Most of these NCD deaths occur in low- and middle-income countries, including the Sub-Saharan Africa (SSA). The burden of chronic diseases is increasing in low- and middle-income countries [1].

NCDs are not only responsible for the enormous human suffering; they also threaten the economies of many countries as they mostly affect the older and experienced members of the workforce. The WHO estimates that deaths from chronic diseases will increase by 77% between 1990 and 2020, and that most of these deaths will occur in the developing regions of the world [2].

South Africa has the highest chronic disease death rate in people aged 15 to 69 years in the African continent [1]. It is estimated that of the nearly 500 000 deaths that occurred during 2000 in South Africa, 37% were due to NCDs [3]. Most patients with chronic diseases are managed at the primary healthcare level in the public health sector. Patients on a medical scheme receive their care in the private sector, mostly from general practitioners. Medical schemes are legally obliged to pay for the treatment of 25 chronic conditions included in the Chronic Disease List (CDL) as part of the Prescribed Minimum Benefits (PMBs). The CDL’s are shown in Table 1. PMBs were introduced into the Medical Schemes Act to ensure that beneficiaries of medical schemes would not run out of benefits for certain conditions and find themselves forced to turn to state facilities for treatment. These conditions are defined by diagnosis codes. Schemes must provide for the diagnosis, medical management and prescribed medication for these conditions, to the extent provided for by way of therapeutic algorithms. This part of the PMBs came into operation on 1 January 2004. PMBs are defined in Regulation 7 of the Medical Schemes Act.

There are no routine South African national data on the prevalence of chronic diseases. The Scheme Risk Measurement (SRM, previously Risk Equalisation Fund) database on chronic diseases is one of the best data sources on the prevalence of chronic diseases in South Africa.

This research brief reviews trends of chronic diseases in the private health care sector. Medical schemes are the main means of financing private health care, covering about 18% (8.7 million) of the South African population in 2011. Membership of medical schemes is strongly linked to employment. In 2010, the membership racial breakdown was 64.3% and 35.7% for blacks and whites respectively [4].
Table 1: Chronic diseases in the Chronic Disease List

<table>
<thead>
<tr>
<th>Chronic Disease Code</th>
<th>Full Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADS</td>
<td>Addison's Disease</td>
</tr>
<tr>
<td>AST</td>
<td>Asthma</td>
</tr>
<tr>
<td>BCE</td>
<td>Bronchiectasis</td>
</tr>
<tr>
<td>BMD</td>
<td>Bipolar Mood Disorder</td>
</tr>
<tr>
<td>CHF</td>
<td>Cardiac failure¹</td>
</tr>
<tr>
<td>CMY</td>
<td>Cardiomyopathy</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obs. Pulmonary Disease</td>
</tr>
<tr>
<td>CRF</td>
<td>Chronic Renal Disease</td>
</tr>
<tr>
<td>CSD</td>
<td>Crohn’s Disease</td>
</tr>
<tr>
<td>DBI</td>
<td>Diabetes Insipidus</td>
</tr>
<tr>
<td>DM1</td>
<td>Diabetes Mellitus 1</td>
</tr>
<tr>
<td>DM2</td>
<td>Diabetes Mellitus 2</td>
</tr>
<tr>
<td>DYS</td>
<td>Dysrhythmias</td>
</tr>
<tr>
<td>EPL</td>
<td>Epilepsy</td>
</tr>
<tr>
<td>GLC</td>
<td>Glaucoma</td>
</tr>
<tr>
<td>HAE</td>
<td>Haemophilia</td>
</tr>
<tr>
<td>HYL</td>
<td>Hyperlipidaemia</td>
</tr>
<tr>
<td>HYP</td>
<td>Hypertension</td>
</tr>
<tr>
<td>IBD</td>
<td>Ulcerative Colitis</td>
</tr>
<tr>
<td>IHD</td>
<td>Coronary Artery Disease</td>
</tr>
<tr>
<td>MSS</td>
<td>Multiple Sclerosis</td>
</tr>
<tr>
<td>PAR</td>
<td>Parkinson's Disease</td>
</tr>
<tr>
<td>RHA</td>
<td>Rheumatoid Arthritis</td>
</tr>
<tr>
<td>SCZ</td>
<td>Schizophrenia</td>
</tr>
<tr>
<td>SLE</td>
<td>Systemic LE</td>
</tr>
<tr>
<td>TDH</td>
<td>Hypothyroidism</td>
</tr>
</tbody>
</table>

¹ CHF was combined with CMY in the prevalence tables.
2 Literature Review

2.1 Chronic Respiratory Conditions

The prevalence of respiratory diseases is expected to rise in low- and middle-income countries because of ageing of the population and the increase in tobacco smoking. However, tobacco smoking is reported to have decreased in South Africa due to tobacco control measures [5]. The most common chronic respiratory diseases in South Africa are asthma (AST) and chronic obstructive pulmonary disease (COPD).

AST was the 13th most important cause of death in South Africa in 2000, accounting for 1.5% of all deaths. South Africa’s AST mortality rates (1.5 per 100 000) in the 5 to 34 years age group are disproportionately higher than in other parts of the world. South Africa’s AST case fatality rate of 18.5 per 100 000 asthmatics is the fifth highest in the world. The CHAMP (Chestiness in Childhood Asthma in Mitchells Plain) study reported AST diagnosis prevalence of 13.1% in pre-school and 11.2% in the school-going children. Many studies report the prevalence of self-reported AST in adults to be between 10% and 13% in South Africa [5].

COPD was the fifth most common cause of death in the world in 2001, responsible for 4.7% of deaths. In South Africa, COPD was responsible for 2.3% of all deaths, mostly in older ages, in 2000. The South African Demographic and Health Survey 1998 (SADHS) reported the overall national prevalence of chronic bronchitis was 2.3% in men and 2.8% in women. The female excess was unexpected given the national figures for smoking in the SADHS were 42% and 11% among men and women respectively [5].

The prevalence of bronchiectasis (BCE) is unknown and varies considerably among different countries. It is relatively common in South Africa because of the large number of infections occurring in this country. Based on a review of an insurance claims database in the United States, it was estimated that about 25 per 100,000 people have BCE. This number increases to 272 per 100,000 for those over 74 years old. BCE is known to occur in patients across the spectrum of age and gender, but older females tend to have higher than average prevalence [6].

2.2 Cardiovascular Conditions

Cardiovascular disease accounts for about 30% of deaths worldwide, and 80% of these deaths are in the developing world [7]. The high morbidity caused by cardiovascular diseases leaves up to 50% of all survivors chronically disabled [8]. Premature cessation of economic activity, along with worsening quality of life due to cardiovascular disease in the economically active population is a huge medical, economic and social problem. Cardiovascular diseases that are covered in the CDL include cardiomyopathy (CMY), coronary artery disease (IHD), dysrhythmias (DYS) and hypertension (HYP).
CMY is a relatively common condition in South Africa, and one of the major contributors to heart failure in Africa. The prevalence of heart failure across the world is unknown, but hospital-based studies indicate that CMY accounts for 20% of all heart failure admissions in African hospitals. The crude estimate of the prevalence of heart failure in developed countries is estimated at 3-20 per 1 000 [9]. A cohort study of patients with confirmed cases of cardiovascular disease who were being treated at the cardiology unit of the Chris Hani Baragwanath Hospital in Johannesburg found that 35% of heart failure cases were attributable to CMY [10].

IHD is very rare in SSA and is diagnosed more frequently among men than women. IHD was diagnosed in 10% of patients with confirmed cases of cardiovascular disease who attended the cardiology unit at the Chris Hani Baragwanath Hospital. Between 1992 and 1994, 36 people from Soweto where diagnosed with IHD at the Chris Hani Baragwanath Hospital in 1994. IHD was responsible for about 0.2% of 20,000 deaths occurring annually in Soweto [10].

HYP is a highly prevalent condition in South Africa and is a risk factor for heart disease and the single most important risk factor for stroke. HYP is called a silent killer because people who have the condition are usually unaware. The 1998 SAHDS reported a hypertension (blood pressure > 160/95 mmHg) prevalence of 12.7% in South Africans over the age of 15 years. The prevalence was 13.9% in women and 10.9% in men [11]. The 2010 South African General Household Survey (GHS), with a slightly different adult age definition, found self-reported diagnosis of HYP prevalence of 10.5% in South African adults 18 years and older. Prevalence in the GHS was 12.9% and 7.5% for females and males respectively [12].

2.3 Chronic Renal Disease

Chronic renal disease (CRF) affects mainly young people in the 20 to 50 years age group in SSA and is primarily due to hypertension and glomerular diseases. CRF is approximately 3 to 4 times more common in Africa than in developed countries [13]. The number of patients enrolled in the end-stage renal disease Medicare-funded (US) program increased from approximately 86,354 beneficiaries in 1983 to 547,892 beneficiaries in 2008 [14]. The prevalence of CRF is unknown in South Africa.

2.4 Gastrointestinal Disorders

Gastrointestinal disorders, including inflammatory bowel diseases such as Crohn's Disease (CSD) and Ulcerative Colitis (IBD), affect more than 200 per 100 000 persons in the West. The peak age for CSD is 20 to 30 years; for IBD, it is 30 to 40 years. IBD occurs more frequently in men, whereas IBD is more common in women [15]. A study conducted in Cape Town estimated the incidences of CSD in the coloured, white and black population groups to be 1.8, 2.6 and 0.3/100 000 per year respectively and those for IBD 1.9, 5.0 and 0.6/100 000 respectively [16]. Data on the prevalence of gastrointestinal disorders in South Africa is scarce.
2.5 Diabetes Mellitus

There are three main types of diabetes mellitus (DM), namely, Diabetes Mellitus Type 1 (DM1), Diabetes Mellitus Type 2 (DM2) and gestational diabetes (which may precede development of DM2). DM1 occurs most commonly in children and accounts for approximately 10% of all diabetes mellitus cases. DM2 diabetes accounts for about 90% of all diabetes cases, and many people who have this condition are undiagnosed [17]. DM2 occurs most commonly in people over age 40. The greatest increase in the prevalence of DM, especially DM2, is expected to occur in Asia and Africa [18]. Diabetes mellitus affects 9.4 million people in Africa [13]. In its website, the Diabetes Society says “that approximately 4-6 million people in SA have diabetes.” The SADHS found prevalence of self-reported diabetes in South African males and females 15 years and older to be 2.4% and 3.7%, respectively. The proportion of deaths attributable to diabetes are more pronounced among women compared to men [5].

2.6 Psychiatric Conditions

Epidemiological data on psychiatric conditions in South Africa and the rest of Africa is lacking. The prevalence of psychiatric disorders is expected to be high in South Africa as a result of stressors such as past history of racial discrimination and political violence. The prevailing levels of poverty, criminal violence, and high rates of gender inequality are likely to contribute to vulnerability to common psychiatric disorders [19]. The two psychiatric disorders, Bipolar Mood Disorder (BMD) and Schizophrenia (SCZ) form part of the 26 chronic diseases covered as PMBs.

2.7 Neurological Disorders

Epilepsy (EPL) is the most common neurological condition [20]. Epilepsy South Africa estimates that about one in every 100 people has epilepsy.

There are no well-documented epidemiological studies on multiple sclerosis (MSS) in South Africa. MSS is not a common condition in South Africa. Some studies have extrapolated the prevalence of MSS to be 1 in 700 (63,500 sufferers) while Multiple Sclerosis South Africa (MSSA) have estimated that there are just about over 5000 cases of MSS in this country [21, 22].

2.8 Auto-immune Conditions

Arthritis is the number one disabling disease in South Africa affecting an estimated one in every seven people. Rheumatoid arthritis (RHA) accounts for about six percent of all reported arthritis cases. RHA arthritis afflicts three times more women than men. Systemic Lupus Erythematosus (SLE) is a disease of primarily young women aged between 15 and 40 years.
2.9 Addison’s Disease

Addison’s disease (ADS) is a very rare condition with a reported prevalence of 93 to 140 cases per million population in the west. The prevalence of Addison’s Disease is unknown in South Africa.

2.10 Diabetes Insipidus

Diabetes Insipidus (DBI) is an uncommon condition with a reported prevalence of three cases per 100,000 population in the United States [23]. The prevalence of DBI is unknown in South Africa.

2.11 Glaucoma

The worldwide prevalence of glaucoma (GLC) is increasing as a result of the rapidly aging population [24]. The prevalence of GLC in the 40 years and older age group is 1.86% in the United States [25]. A conservative estimate of the prevalence of glaucoma in Africa is that it occurs in 4% of people older than 40. In South Africa, glaucoma affects up to 5.3% of people in this age group. The proportion of blindness that can be attributed to glaucoma in South Africa is 23% [26, 27].

2.12 Haemophilia

The worldwide prevalence of haemophilia (HAE) is between 1.8 and 11.4 cases per 100,000 male individuals [28]. About one per 5 000 males are born with haemophilia [29]. The prevalence of HAE is unknown in South Africa.

2.13 Hyperlipidaemia

According to the Heart and Stroke Foundation South Africa, it is estimated that 80% of South Africans who live in cities have raised bad cholesterol, and 20% of them have levels that place them at high risk of developing heart disease.

2.14 Parkinson’s disease

Parkinson’s disease (PAR) is the most common neurodegenerative disease after Alzheimer’s disease. The worldwide prevalence of PAR is 1% among persons over 60 years of age and rises to 4% of the population over 80 [30, 31]. Few PAR-related studies have been published in Africa and consequently, little is known about the epidemiology of PAR in South Africa [32, 33].

2.15 Hypothyroidism

Hypothyroidism (TDH) is more common in older women and ten times more common in women than in men, and
increases with age. Prevalence of previously diagnosed and treated TDH ranges from 14 to 19 per 1000 women. Other studies in Europe, Japan and USA have reported prevalence that ranges between 0.6 and 12 per 1000 in women and between 1.3 and 12 per 1000 in men [34]. There is not enough epidemiological data on hypothyroidism in South Africa. It is believed that the incidence of TDH in whites is comparable to incidences in Europe and North America and the incidence for blacks is higher [35].

3 Study objective

The objective of the study presented in this Research Brief was to report on the trends in the prevalence of chronic diseases in the South African medical schemes industry from 2006 to 2011.

4 Methodology

4.1 Study Population

The study was conducted on the South African medical schemes industry. The study population consisted of all registered open and restricted schemes between 2006 and 2011. Medical schemes exempted from the rules governing the provision of PMBs were not included in the analysis.

4.2 Data

As part of the SRM project, all registered medical schemes submit monthly treated chronic disease prevalence data to the Council for Medical Schemes on a quarterly basis. Medical schemes used the rules set out by the Entry and Verification criteria to identify each chronic disease case [36]. The number of beneficiaries included in the analysis by age, gender and year are shown in Appendix A. The medical schemes have an overrepresentation of young children and beneficiaries over the age of 35 years compared to the South African general population as shown in Figure 1.
The month of June was selected for each of the years, as well as only the data from those schemes that reported good quality data. In previous data quality analysis, the data submitted for the month of June in any year was found to be reliable and a better reflection of the schemes’ risk profile. Data quality classification is discussed in the Annual Scheme Risk Measurement report [37]. The month-to-month variation in the reported prevalence of chronic diseases reduced substantially between 2006 and 2009, indicating consistency in reporting and improved data quality. This variation has remained low between 2009 and 2011.

The SRM Contribution Table [38] was used to calculate estimated cost of diagnosing and treating chronic diseases. The SRM Contribution Table is a table of average costs for each CDL condition by age.

### 4.3 Data management and analysis

The data was extracted into a Windows Excel spreadsheet format and imported to a STATA statistical software package for management and analysis. The output was then transcribed to Excel for tabulating summary statistics and constructing graphical representations of the results. Descriptive statistics were calculated to produce summary statistics of key variables.
5 Results: Trends of chronic conditions

5.1 Chronic respiratory conditions

Figure 2 shows the prevalence of treated chronic respiratory diseases of medical scheme members by gender. The overall prevalence of asthma in the medical aid population increased from 12.3 per 1000 in 2006 to 15.0 per 1000 in 2011. This represents an increase of 22%. AST rates were slightly higher in the female compared to the male medical scheme beneficiaries.

The treated COPD rates decreased between 2006 and 2011. The overall treated prevalence for COPD was 1.7 per 1000 in 2006 and decreased by 24% to 1.3 per 1000 in 2011. More males (1.5 per 1000) than females (1.1 per 1000) received treatment for COPD in 2011.

The overall prevalence of treated BCE has remained unchanged at about 0.1 per 1000 between 2006 and 2011. There was no difference by gender.

Figure 2: Overall prevalence of treated asthma, bronchiectasis and COPD by gender.

In 2011, on the basis of SRM data submitted by all medical schemes to the Council for Medical Schemes, it was estimated that the annual cost for diagnosis and treatment of medical schemes beneficiaries with AST was R888 494 351, which is more than the combined annual estimated cost for COPD (R335 533 078) and BCE (R4 216 086).

The treated AST prevalence curves by age in Figure 3 suggest that the biggest increase between 2006 and 2011 was in the older age groups. The prevalence among children under 5 years increased from 4.9 per 1000 in 2006 to 11.3 per 1000 beneficiaries in 2011. This represents a 131% increase. The prevalence in children under the
Age of 5 years in 2011 was 9.4 per 1000 and 13.1 per 1000 for female and male respectively. The diagnosis and treatment of children in the 5 to 14 years age group increased by 142% from 6.8 per 1000 in 2006 to 16.3 per 1000 in 2011. The prevalence was 13.0 per 1000 in females and 19.6 per 1000 in males in the 5 to 14 years age group in 2011. The prevalence in the 20 to 39 years age group increased by 168% from 3.5 per 1000 to 9.4 per 1000. Prevalence in the age group 40 years and older increased by 200% from 6.9 per 1000 to 20.6.

Figure 3: Treated Asthma by Age

The prevalence of COPD has decreased across all age bands between 2006 and 2011. Fewer cases of COPD were reported in younger age groups (<40 years). The overall prevalence for beneficiaries over the age of 40 years decreased from 4.6 per 1000 to 3.3 per 1000.
The prevalence of bronchiectasis has remained unchanged during the SRM data collection period (Figure 5). Bronchiectasis was treated in 0.14 per 1000 and 0.08 per 1000 female and male beneficiaries over the age of 40 respectively. The overall prevalence was 0.11 per 1000 for beneficiaries over the age of 40 years.
5.2 Cardiovascular conditions

As shown in Figure 6, the overall prevalence of diagnosis and treatment of CMY paid for by medical aid schemes increased slightly from 3.6 per 1000 in 2006, to 4.3 per 1000 in 2011. The differences by gender were not significant. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with CMY was R990, 857, 958.

Nearly double the proportion of male medical schemes beneficiaries were diagnosed with coronary artery disease, compared to female beneficiaries. In 2006, coronary artery disease prevalence in males was 8.3 per 1000 compared to 4.5 per 1000 in females. The treated prevalence rates increased to 9.1 per 1000 and 5.0 per 1000 in 2011 in males and females respectively. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with coronary artery disease was R1, 076, 661, 782.

Very few cases of DYS were reported in medical schemes beneficiaries. The overall prevalence increased from 2.6 in 2006 to 3.3 per 1000 in 2011. Small differences were observed in the prevalence rates between female and male beneficiaries. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with DYS was R312, 020, 590.

HYP was the fastest increasing cardiovascular condition, increasing by 37% between 2006 and 2011 (57.6 to 78.8 per 1000). In 2011, more female than male beneficiaries received treatment for hypertension (81.2 vs. 73.1 per 1000). The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with hypertension was R2, 992, 887, 249.

Figure 6: Overall prevalence of cardiovascular conditions by gender.
The prevalence of treated CMY has shown a slight increased across all age bands between 2006 and 2011. Very few cases of CMY were reported in younger age groups (<40 years). The overall prevalence of treated CMY for beneficiaries over the age of 40 years increased from 9.7 per 1000 in 2006, to 10.6 per 1000 in 2011. Similar increases were observed in male and female beneficiaries (Figure 7).

**Figure 7: Treated prevalence of Cardiomyopathy.**

The overall prevalence of treated IHD for beneficiaries over the age of 40 years showed an insignificant increase from 17.3 per 1000 in 2006, to 17.7 per 1000 in 2011 (Figure 8).

**Figure 8: Treated prevalence of Coronary artery diseases.**
The overall prevalence of DYS for beneficiaries over the age of 40 years increased from 6.9 per 1000 in 2006, to 8.46 per 1000 in 2011. The prevalence of DYS was lower in the younger age groups (Figure 8).

**Figure 9: Treated prevalence of Dysrhythmias.**

The prevalence of treated HYP has shown a consistent increase across all age groups (Figure 10). The prevalence increased at a faster rate (44%) in the 15 to 39 age group, from 8.1 per 1000 in 2006 to 11.7 per 1000 in 2011 for all beneficiaries. Prevalence for beneficiaries over the age of 40 years increased from 151.2 per 1000 in 2006, to 192.8 per 1000 in 2011. This represents an increase of 28% in this age group.

**Figure 10: Prevalence of treated hypertension**
5.3 Chronic renal disease

The overall prevalence of treated CRF increased from 0.2 per 1000 in 2006, to 0.3 per 1000 in 2011. More male than female beneficiaries were treated for CRF. In 2011, the prevalence of CRF was 0.4 per 1000 in males and 0.3 per 1000 in females. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with CRF was R744,778,310.

Figure 11: Overall prevalence of Chronic Renal Disease by gender

Very few cases of CRF were observed in beneficiaries younger than the age of 20 years. The prevalence of treated CRF in the 20 to 39 years age group was about 0.1 per 1000 in both 2006 and 2011. A notable increase was observed in the 40 years and older age group, from 0.5 per 1000 in 2006, to 0.7 per 1000 in 2011.

Figure 12: Treated prevalence of Chronic Renal Disease.
5.4 Gastrointestinal disorders

Very few beneficiaries were treated for Crohn’s Disease (CSD) in the private healthcare sector. There were 617 and 1,051 medical scheme beneficiaries treated for CSD per month in 2006 and 2011 respectively. This represented a marginal decrease from 0.19 per 1000 in 2006, to 0.15 per 1000 in 2011. Ulcerative Colitis (IBD) is also a relatively rare condition in medical schemes. The prevalence was 0.3 per 1000 in 2011 (Figure 13).

The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with gastrointestinal disorders was R54,915,071.

Figure 13: Overall prevalence of Gastrointestinal Conditions by gender.

The prevalence of CSD for beneficiaries over the age of 20 years remained unchanged at about 0.2 per 1000 between 2006 and 2011. Very few cases of CSD were observed in child beneficiaries (Figure 14).
The prevalence of IBD for beneficiaries over the age of 20 years remained unchanged at about 0.4 per 1000 between 2006 and 2011. Very few cases of IBD were observed in child beneficiaries (Figure 15).

Figure 15: Treated prevalence of Ulcerative Colitis by Age.
5.5 Diabetes mellitus

The overall prevalence of DM1 in the medical schemes population remained unchanged at about 2.6 per 1000 between 2006 and 2011, as shown in Figure 16. More male than female beneficiaries were diagnosed and treated for DM1 (3.0 per 1000 vs. 2.2 per 1000).

The overall prevalence of DM2 has increased from 12.0 per 1000 in 2006, to 22.1 per 1000 in 2011. This represents an increase of 84%. An increase close to 100% was observed in the female beneficiaries (9.5 to 18.9 per 1000) and male prevalence increased by 76% (14.6 to 25.7 per 1000).

Figure 16: Overall prevalence of Diabetes Mellitus by gender

The prevalence of DM1 in children between the ages of 5 and 14 years was 1.0 per 1000 throughout the period under review. There was no difference in prevalence by gender in this age group. Prevalence remained unchanged between 2006 and 2011 at about 2.1 per 1000 and 4.2 per 1000 in the 15 to 39 years and 40 years and older age groups, respectively (Figure 17). The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with DM1 was R567, 228, 963.
As expected, very few cases of DM2 were observed in child beneficiaries as shown in Figure 18. DM2 prevalence in the 15 to 39 years age group increased from 2.1 per 1000 in 2006, to 4.1 per 1000 in 2011. The age group 40 years and older experienced a 72% prevalence increase, 31.0 per 1000 in 2006 to 53.2 per 1000 in 2011. A higher proportion of male (63.5 per 1000) than female (44.3 per 1000) beneficiaries were treated for DM2 in the age group 40 years and older. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with DM2 was R2, 120, 924, 382.
5.6 Psychiatric conditions

The overall prevalence of treated BMD increased by 250% between 2006 and 2011, from 0.7 to 2.3 per 1000 beneficiaries. A similar rate of increase was observed in females and males. BMD was diagnosed and treated in 2.9 and 1.6 per 1000 in female and male beneficiaries in 2011.

The prevalence of SCZ has remained under 0.5 per 1000 between 2006 and 2011. Similar rates were observed in both males and females (Figure 19). The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with BMD and SCZ was R464,351,768.

Figure 19: Overall prevalence of psychiatric disorders by gender

Very few beneficiaries under the age of 14 years were treated for BMD (Figure 20). The prevalence of BMD in female beneficiaries in the 15 to 39 years age group increased from 1.0 per 1000 in 2006, to 3.6 per 1000 in 2011. For males, prevalence was 0.5 per 1000 in 2006 and 2.9 per 1000 in 2011. Similar trends were observed in the 40 years and older age group (1.2 to 4.0 per 1000 in females, and 0.7 to 2.3 per 1000 in males).
Figure 20: Treated prevalence of Bipolar Mood Disorder by Age

Figure 21: Treated prevalence of Schizophrenia by Age
5.7 Neurological disorders

The overall prevalence of treated EPL increased by 15% from 3.5 per 1000 in 2006, to 4.0 per 1000 beneficiaries in 2011. Very few beneficiaries were treated for MSS (0.1 per 1000). The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with epilepsy and MSS was R603, 847, 257.

Figure 22: Overall prevalence of Neurological Disorders by gender

The prevalence of treated epilepsy was strongly correlated with age, increasing from 0.9 per 1000 in the 0 to 5 years age group, 2.3 per 1000 in the 5 to 14 years age group, 3.3 per 1000 in the 15 to 39 years age group, and to 6.1 per 1000 in the 40 years and older age group. The gender differences were not significant (Figure 23).

Figure 23: Prevalence of treated epilepsy by age
MSS was rarely seen in both the very young and older age groups, and mostly affected women, as shown Figure 24.

Figure 24: Treated prevalence of Multiple Sclerosis by Age

5.8 Auto-immune Conditions

The overall prevalence of treated RHA increased from 2.0 per 1000 in 2006, to 2.6 per 1000 in 2011. More female than male beneficiaries were treated for rheumatoid arthritis. Prevalence in females increased from 2.8 to 3.8 per 1000 compared to a change of 1.1 to 1.4 per 1000 in males between 2006 and 2011.

The overall prevalence of treated SLE increased from 0.16 to 0.22 per 1000 for all the years between 2006 and 2011. In 2011, seven times more women than men were diagnosed and treated for SLE.

The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with RHA and SLE was R264,777,872.
Figure 25: Overall prevalence of Auto-immune Conditions by gender

The prevalence of RHA females in the 40 years and older age group increased from 6.9 to 8.6 per 1000 between 2006 and 2011. The increase was slower in males, 2.8 to 3.3 per 1000 (Figure 26).

As shown in Figure 27, SLE prevalence in females was higher in the 40 years and older age group (0.7 per 1000) compared to the 15 to 39 years age group (0.3 per 1000).

Figure 26: Treated prevalence of Rheumatoid Arthritis by Age
5.9 Addison’s disease

The overall prevalence of ADS in medical aid schemes beneficiaries averaged 0.06 per 1000 between 2006 and 2011. The male-to-female prevalence ratio was 1:1.2 – 1.5 [39]. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with ADS was R1,358,808. ADS was atypically more common in the 40 years and older age groups in both male and female beneficiaries (Figure 29).
5.10 Diabetes Insipidus

The overall prevalence of DBI in the medical aid schemes beneficiaries was 0.2 per 1000 in 2011 (Figure 30). There was no significant age or gender-related differences (Figure 31) in the prevalence of DBI. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with DBI was R2, 077, 432.
5.11 Glaucoma

The overall prevalence of GLC increased from 1.8 per 1000 in 2006, to 2.7 per 1000 in 2011. There was no significant gender related difference (Figure 32). The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with GLC was R143,028,968. GLC in medical schemes beneficiaries was more common in the 40 years and older age group. Prevalence in beneficiaries over the age of 40 years increased from 5.0 to 7.0 treated cases per 1000.

Figure 32: Overall prevalence of Glaucoma by gender
5.12 Haemophilia

The number of South African medical aid schemes beneficiaries treated for HAE increased from 39 in June 2006 to 98 cases in June 2011. The overall prevalence in male beneficiaries was 2.8 per 100,000 in 2011 (Figure 34 & Figure 35). Virtually all these cases were male. The 2011 annual estimated cost for diagnosis and treatment of medical schemes beneficiaries with HAE was R25,072,040.

Figure 34: Overall prevalence of Haemophilia by gender
5.13 Hyperlipidaemia

A steady increase in the overall prevalence of treated HYL was noted between 2006 and 2011; it increased from 23.9 per 1 000 in 2006 to 32.9 per 1 000 in 2011. More male than female beneficiaries were diagnosed and treated for the condition. In male beneficiaries, prevalence increased from 30.4 to 40.2 per 1 000 between 2006 and 2011; an increase from 18.0 to 26.6 per 1 000 was seen in female beneficiaries during the same period (Figure 36). The 2011 annual estimated cost for the diagnosis and treatment of medical scheme beneficiaries with HYL was R1 605 854 403.
Prevalence for male and female beneficiaries in the 15 to 39 years age group increased from 4.7 and 1.7 cases per 1000 in 2006, to 5.0 and 2.0 cases per 1000 in 2011, respectively. The fastest increase was observed in the 40 years and older age group, increasing from 80.6 and 47.7 per 1000 in 2006, to 101.6 and 65.0 per 1000 in 2011 for males and females respectively (Figure 37).
5.14 Parkinson’s disease

The overall prevalence of PAR increased from 0.5 to 0.8 per 1000 between 2006 and 2011 (Figure 38).

Figure 38: Overall prevalence of Parkinson’s disease by gender

Prevalence of PAR among beneficiaries in the 60 to 79 years age group increased from 3.9 to 4.4 per 1000 between 2006 and 2011. Prevalence was higher among beneficiaries in the 80 years and older age group, increasing from 11.0 per 1000 in 2006, to 12.2 per 1000 in 2011. Very small gender-related changes in prevalence were observed (Figure 39).

Figure 39: Treated prevalence of Parkinson’s disease by Age
5.15 Hypothyroidism

Over six times more female than male beneficiaries were treated and diagnosed for TDH between 2006 and 2011. The overall prevalence increased from 9.7 to 13.7 per 1000 beneficiaries. Prevalence increased by 20% in female beneficiaries, from 16.5 per 1000 in 2006, to 22.6 per 1000 in 2011. Prevalence for males averaged 3.1 per 1000 between 2006 and 2011 (Figure 40).

Figure 40: Overall prevalence of Hypothyroidism by gender

Prevalence of the condition increased from 40.1 per 1000 in 2006 to 52.7 per 1000 in 2011 among female beneficiaries in the 40 years and older age group. Prevalence for males in the same age group increased from 3.0 to 9.2 per 1000 (Figure 41).

Figure 41: Treated prevalence of Hypothyroidism by Age
6 Discussion and conclusion

There has been a sustained upward trend in diagnosis and treatment of many chronic conditions on the Chronic Disease List. These increases may be due to improved data management systems of medical schemes and administrators, the worsening age and disease profile of beneficiaries, and the increased beneficiary awareness of entitlements. Unfortunately, it is not possible to isolate the different components that contribute to the observed trend. Behavioural change of members and providers can also explain the observed trends.

The increase observed in the prevalence of treated chronic respiratory conditions was mostly attributable to asthma (AST). AST increased by 22% between 2006 and 2011. The biggest increase in the prevalence of AST between 2006 and 2011 was in the older age groups. The observed increases may be attributed to the worsening disease profile, the improved ability of medical schemes to correctly identify beneficiaries with chronic diseases or Chronic Obstructive Pulmonary Disease (COPD) in the older age bands is misclassified as AST. The prevalence of treated AST observed in medical scheme child and adult beneficiaries is extremely lower than the AST prevalence reported in other studies. The gender variation in the prevalence of COPD in medical schemes was consistent with the national figures for current smoking reported in the SADHS, where 42% of men and 11% of women were smokers [5]. The unexpected drop of COPD in 2010 may be attributable to data quality issues. COPD in the younger age groups is likely to be a misclassification or a data quality issue. Difficulty in diagnosing bronchiectasis (BCE) may be responsible for the low reported rates. Higher prevalence of BCE in older females is consistent with observations in other studies [6].

Medical scheme beneficiaries were diagnosed and treated for hypertension (HYP) increased by 37% between 2006 and 2011, making it one of the fastest increasing cardiovascular conditions and most prevalent chronic disease. The odd marked drop in the prevalence of HYP in 2010 is likely to be as a result poor application of the Entry and Verification criteria for the identification of chronic diseases. Just about R 3 billion was paid by medical schemes to diagnose and treat HYP. The increase observed in the prevalence of coronary artery disease (IHD) is consistent with results observed in other studies. Over R 1 billion was paid out by medical schemes to manage IHD. Cardiomyopathy (CMY) was diagnosed in fewer than five per 1000 beneficiaries but the cost to the industry was about R 1 billion. Collectively, medical schemes paid about R 5 billion rand to manage cardiovascular diseases.

Chronic renal disease (CRF) increased by about 40% in beneficiaries over the age of 40 years. Overall, CRF was the fourth fastest increasing chronic disease on the CDL, increasing by 48%. The estimated cost of treating chronic renal disease was about R0.7 billion in 2011. CRF is one of the most expensive chronic conditions to treat.
Very few medical scheme beneficiaries were treated for gastrointestinal conditions. The rarity of Crohn’s disease (CSD) and ulcerative colitis (IBD), data quality and the difficulty in accurately identifying cases is the possible reason for lack of a clear trend between 2006 and 2011.

The gender differences in the prevalence of Diabetes Mellitus Type 1 (DM1) are consistent with the 1998 SADHS survey, which reported higher rates of diabetes in females. The prevalence of DM1 has remained unchanged at 2.4 per 1000 beneficiaries between 2006 and 2011. The reasons for this observation are unclear. It has been suggested that some DM1 cases might be misclassified as Diabetes Mellitus Type 2 (DM2). The 85% increase in the prevalence of treated DM2 indicates the importance of chronic diseases of lifestyle as a one of the factors that is driving costs in the medical schemes industry.

The prevalence of treated Bipolar Mood Disorder (BMD) increased by more than 200% between 2006 and 2011, from 0.7 to 2.3 per 1000. BMD was more common in female than male beneficiaries. There are concerns in the private healthcare industry that some mental health conditions that are not PMBs are classified as bipolar mood disorder in order to ensure reimbursement by medical schemes. Schizophrenia (SCZ) was very rare and mostly affected older and female beneficiaries.

Epilepsy (EPL) was the most common condition in the neurological group of conditions accounting 97% of the prevalence in the group. About 24% of all neurological conditions treatment and diagnosis costs were attributable to MSS.

The autoimmune group of conditions was made up of 91% of rheumatoid arthritis (RHA) and 9% of Systemic Lupus Erythematosus (SLE) cases. Both RHA and SLE affected more female than male beneficiaries.

Hyperlipidaemia (HYL) was one of the fastest increasing chronic condition in the medical scheme beneficiaries. The increase is likely to be partly due to lifestyle changes in the population. More than 1.6 billion was paid out to healthcare providers by medical schemes to treat HYL.

The top ten chronic conditions that showed the fastest increase were Bipolar Mood Disorder, Diabetes Mellitus Type 2, Chronic Renal Disease, Parkinson’s Disease, Glaucoma, Hypothyroidism, Systemic LE, Hyperlipidaemia, and Hypertension.

The implications of more medical schemes beneficiaries with chronic diseases is an increase in GP and specialists visits, an increase in the use of medicines, and a possible increase in hospital events. Without aggressive intervention into the root causes of these chronic diseases and their costs, these trends are expected to continue to worsen.
7 References


8 Acknowledgements

The research team responsible for this work was led by Mondi Govuzela, a research analyst at the Research and Monitoring Unit, Council for Medical Schemes (CMS). We also acknowledge the contributions made to the development of these ideas by Ms Carrie-Anne Cairncross, Mr. Michael Willie, and Dr. Anton de Villiers.
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