



# **Prevalence of chronic diseases in the population covered by medical schemes in South Africa**

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**February 2017**

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## Executive Summary

The Medical Schemes Act, 131 of 1998 makes it mandatory for medical schemes to cover costs for the diagnosis, treatment or care of a defined set of benefits or Prescribed Minimum Benefits (PMBs), regardless of the benefit option members have selected. PMBs include any medical condition which meets the definition of an emergency, a limited set of 270 medical conditions and 26 chronic conditions defined in the Chronic Disease List (CDL). CDL specifies medication and treatment for the chronic conditions that are covered as PMBs. This law ensures that beneficiaries with chronic conditions are not risk-rated.

The Council for Medical schemes (CMS) conducted a retrospective study of the CMS Scheme Risk Measurement (SRM) database to establish changes in the frequency of chronic diseases among beneficiaries of medical schemes between 2010 and 2015. This study is an update of the *“Prevalence of chronic diseases in the population covered by medical schemes in South Africa”* published by CMS in December 2015.

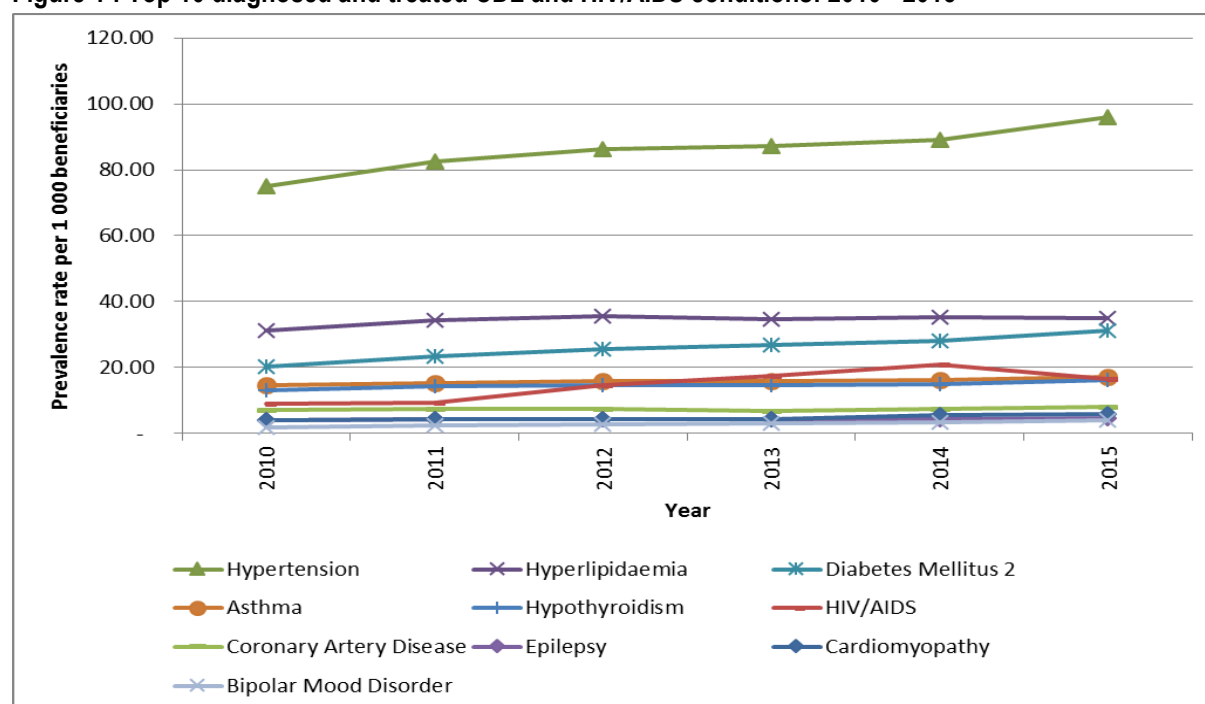
For the first time in 2015, the CMS also analysed data on a more relaxed definition of prevalence as opposed to the SRM definition of prevalence. The results of the analysis are contained in Annexure A of this report. This report analyses prevalence as defined in the SRM process using the Entry and Verification (E&V) criteria while Annexure A of this report analyses a more relaxed definition of prevalence (i.e. prevalence of conditions listed as CDL's whether treated and registered on a program or not).

The findings of this study indicate that in 2015, the upward trend in diagnosis and treatment of many conditions on the chronic disease list continued. The top 10 ranking of chronic conditions according to prevalence rates did not change significantly between 2014 and 2015.

The top 10 ranked CDL's and HIV/AIDS (chronic conditions with the highest prevalence rates) are hypertension, hyperlipidaemia, diabetes mellitus 2, HIV/AIDS, asthma, hypothyroidism, coronary artery disease, cardiomyopathy, epilepsy, and bipolar mood disorder (Figure 1). The CDL's listed as top 10 ranking CDL's had prevalence rates of at least 3 per 1 000 beneficiaries in 2015.



**Figure 1 : Top 10 diagnosed and treated CDL and HIV/AIDS conditions: 2010 - 2015<sup>1</sup>**



Hypertension, hyperlipidaemia and diabetes mellitus 2 continued to be the highest prevalent CDL's in medical schemes beneficiaries with the prevalence of more than 20 per 1 000 beneficiaries. HIV/AIDS moved one position down from being the fourth ranking CDL to being the fifth ranking condition in medical scheme beneficiaries (Table 1). A detailed summary of the top 10 prevalence ranking CDL's (and HIV/AIDS) is given in Table 1.

<sup>1</sup> The 2014 data has been revised

**Table 1: Prevalence of treated chronic conditions (Cases/1 000 beneficiaries), 2014 and 2015**

Rank (2014)	Condition	Type	Prevalence			% Changes		Average growth rate (per year %)
			2010	2014**	2015	2014 vs 2015	2010 vs 2015	
1 (1)	Hypertension (HYP)	Total	75.09	89.07	96.05	7.8	27.9	5.0
		Open	79.09	86.76	92.96	7.1	17.5	3.3
		Restricted	69.13	91.95	100.08	8.8	44.8	7.7
2 (2)	Hyperlipidaemia (HYL)	Total	31.17	35.41	34.90	-1.4	12.0	2.3
		Open	34.77	39.11	42.71	9.2	22.8	4.2
		Restricted	25.80	30.80	24.72	-19.7	-4.2	-0.9
3 (3)	Diabetes mellitus type 2 (DM2)	Total	20.29	27.91	31.21	11.8	53.8	9.0
		Open	19.30	24.04	26.86	11.7	39.2	6.8
		Restricted	21.77	32.75	36.90	12.7	69.5	11.1
5 (4)	HIV/AIDS (Receiving ARVs)***	Total	8.99	20.96	16.40	-21.8	82.4	12.8
		Open	7.01	13.35	12.72	-4.8	81.4	12.7
		Restricted	11.95	30.47	26.01	-14.6	117.7	16.8
4 (5)	Asthma (AST)	Total	14.65	16.09	17.13	6.5	17.0	3.2
		Open	14.72	15.89	16.74	5.3	13.7	2.6
		Restricted	14.54	16.35	17.65	8.0	21.4	4.0
6 (6)	Hyperthyroidism (TDH)	Total	12.99	14.76	16.24	10.0	25.0	4.6
		Open	13.74	14.89	16.49	10.7	20.0	3.7
		Restricted	11.87	14.60	15.92	9.0	34.1	6.0
7 (7)	Ischaemic heart disease (IHD)	Total	7.01	7.28	7.94	9.1	13.2	2.5
		Open	8.34	8.35	9.19	10.1	10.2	2.0
		Restricted	5.04	5.94	6.31	6.2	25.3	4.6
8 (8)	Cardiomyopathy (CMY & CHF)	Total	3.91	5.45	5.77	5.8	47.3	8.1
		Open	4.38	4.90	5.21	6.3	18.9	3.5
		Restricted	3.22	6.13	6.49	5.9	101.8	15.1
9 (9)	Epilepsy (EPL)	Total	3.86	4.36	4.65	6.5	20.6	3.8
		Open	4.09	4.41	4.66	5.7	14.1	2.7
		Restricted	3.51	4.31	4.63	7.5	31.8	5.7
10 (10)	Bipolar mood disorder (BMD)	Total	1.91	3.45	3.97	15.0	108.1	15.8
		Open	2.14	4.13	4.74	14.7	121.4	17.2
		Restricted	1.56	2.61	2.97	14.0	90.1	13.7

\*\* All 2014 data has been revised and as result may differ from the results published in prior reports.

\*\*\* Refer to section 4.3.16 for a note on the decrease year on year for treated HIV/AIDS prevalence.

Table 1 and Figure 2 depict trends in the top 10 common conditions between 2010 and 2015. Hypertension retained its rank as the highest prevalent CDL in medical schemes beneficiaries with an overall prevalence rate of 96.05 per 1 000 beneficiaries in 2015. Hypertension prevalence increased by 7.8 % in 2015 as compared to 2014. Over the period between 2010 and 2015, hypertension prevalence increased by 27.9% resulting in the average annual growth rate of 5.0% per year for the period. The growth in hypertension prevalence has been consistent in open and restricted schemes for the period under review.

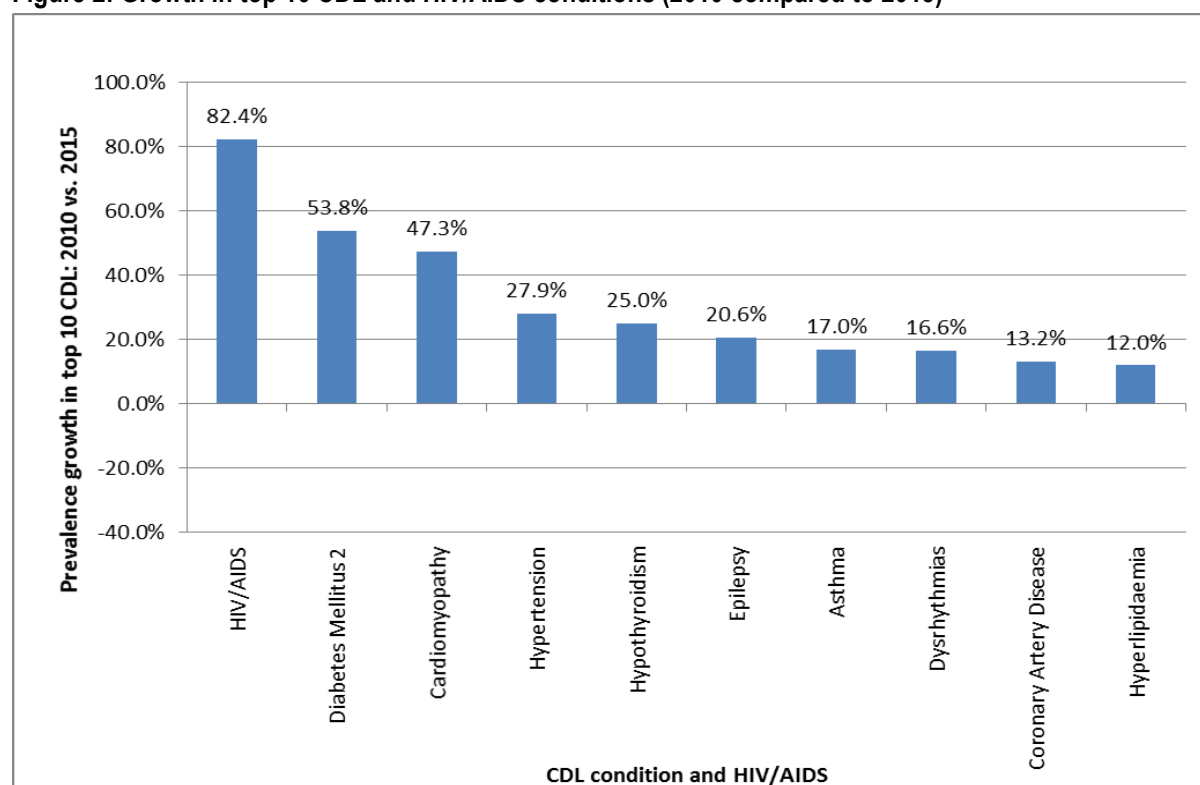
Hyperlipidaemia continued to be the 2<sup>nd</sup> ranked CDL in terms of prevalence despite the prevalence rate decreasing by -1.4% between 2014 and 2015. Between 2010 and 2015, the prevalence of hyperlipidaemia increased by 12.0% resulting in an average growth rate of 2.3% per year for the period under review.

Diabetes mellitus type 2 is still the 3<sup>rd</sup> ranked CDL in terms of prevalence. Between 2010 and 2015, prevalence of diabetes mellitus type 2 increased by 53.8% (from 20.29 to 31.21 per 1 000). This represents an average growth rate of 9.0% per year for the period between 2010 and 2015.

HIV/AIDS ranked the 5<sup>th</sup> chronic condition in terms of prevalence. Between 2010 and 2015, treated HIV/AIDS prevalence increased by about 82.4%. This resulted in the average growth rate of about 12.8% per year for the period under review.

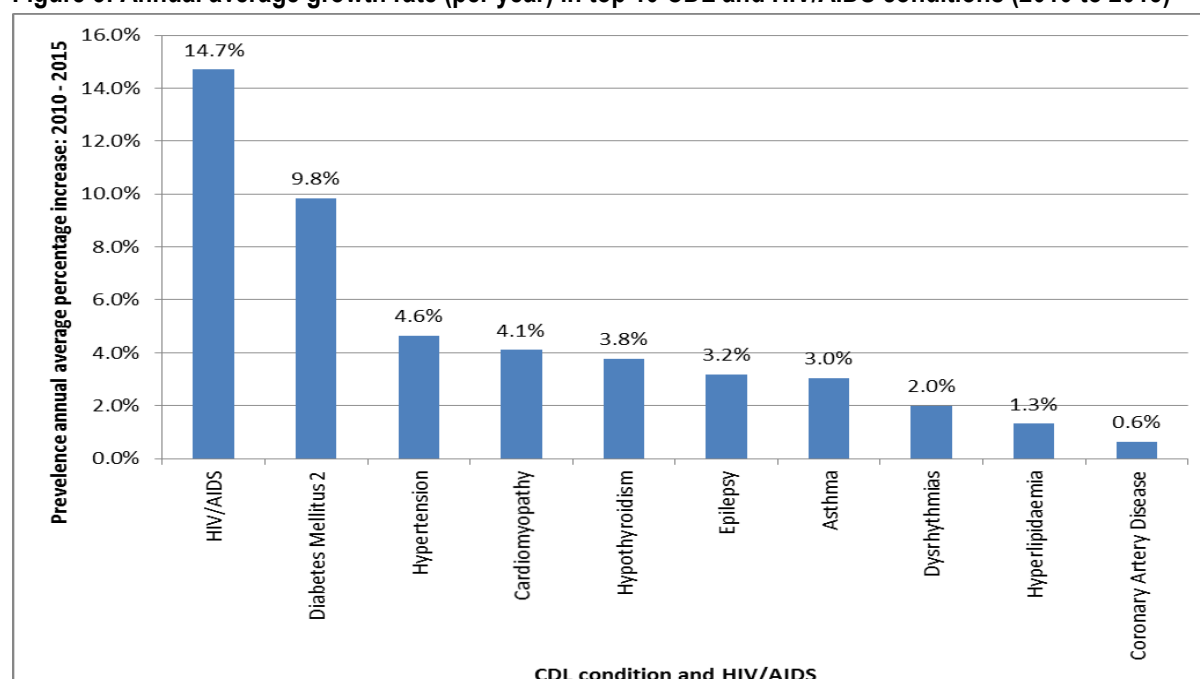
The treated HIV/AIDS prevalence declined from 20.96 per 1 000 beneficiaries in 2014 to 16.40 per 1 000 beneficiaries in 2015 (resulting in a year on year decrease of -21.8%). This is a worrying factor as the decrease was not expected. This decrease needs to be interpreted with caution as this may be a data quality issue. Incomplete data from medical schemes and third parties may be the cause of the decline. The CMS is in a process of investigating the HIV/AIDS prevalence rates submitted by the medical schemes in order to establish the reasons underlying the unexpected decline.

**Figure 2: Growth in top 10 CDL and HIV/AIDS conditions (2010 compared to 2015)**



Other CDL conditions had prevalence rates that are below 16 per 1 000 beneficiaries (as shown in Table 1). The average growth rates per year for the top 10 CDL conditions (for the period 2010 and 2015) are as summarised in Figure 3 below. According to Figure 3, HIV/AIDS has been the fastest increasing condition followed by diabetes mellitus type 2 with the average growth rate of these CDL's being above 9% per year. Other conditions, though increasing, had annual average growth rates that were below 9% per year.

**Figure 3: Annual average growth rate (per year) in top 10 CDL and HIV/AIDS conditions (2010 to 2015)**



The number of medical scheme beneficiaries who were diagnosed and treated for multiple CDL conditions continued with the upward trend in 2015. This might have a negative impact on the risk profiles of medical schemes. The deterioration in risk profiles should be a concern for medical schemes.

The upward trend in diagnosis and treatment of many chronic conditions on the CDL continued in 2015. This study is not yet in a position to isolate specific reasons for this increase in chronic diseases, the trend could still be generally attributed to improved data management systems of medical schemes and administrators, the deteriorating disease profile and increased beneficiary awareness of entitlements and changes in care-seeking behaviour.

# 1 Introduction

The Medical Schemes Act, 131 of 1998 makes it mandatory for medical schemes to cover costs for the diagnosis, treatment or care of a defined set of benefits or Prescribed Minimum Benefits (PMBs), regardless of the benefit option members have selected. PMBs include any medical condition which meets the definition of an emergency, a limited set of 270 medical conditions and 26 chronic conditions defined in the Chronic Disease List (CDL). CDL specifies medication and treatment for the chronic conditions that are covered as PMBs.

The recent study conducted by the CMS evaluated prevalence of CDL's and HIV/ADS in medical schemes as reported in the CMS Scheme Risk Measurement (SRM) database for the period 2009 to 2014 and was published in December 2015 [47]. The study was a follow up to the 2014 study which evaluated the CMS Scheme Risk Measurement database for the period 2008 to 2013.

In 2016/17 the CMS conducted a retrospective study of the CMS Scheme Risk Measurement database for the period 2010 to 2015. This report presents the results of the retrospective review of the trends in the prevalence of chronic diseases in the medical schemes industry from 2010 to 2015. This is a follow-up to the *“Prevalence of chronic diseases in the population covered by medical schemes in South Africa”* published by CMS in December 2015.

It should be noted that CDL and HIV/AIDS prevalence in prior reports as well as this report is defined as SRM definition of prevalence as guided by the Entry and Verification (E&V) criteria. Thus, prevalence in these reports has been interpreted as prevalence of diagnosed and treated CDL conditions of medical scheme beneficiaries.

For the first time in 2015, the CMS also analysed data on a more relaxed definition of prevalence as opposed to the SRM definition of prevalence. The results of the analysis are contained in Annexure A of this report. This report analyses prevalence as defined in the SRM process using the Entry and Verification (E&V) criteria while Annexure A of this report analyses a more relaxed definition of prevalence (i.e. prevalence of conditions listed as CDL's whether treated and registered on a program or not).

## **2 Literature review**

### **2.1 Chronic respiratory conditions**

Chronic respiratory diseases (CRDs) are among the leading causes of death worldwide. The prevalence of respiratory diseases is expected to rise in low- and middle-income countries because of increasing urbanisation amongst other factors [1]. The most common chronic respiratory diseases in South Africa are asthma and chronic obstructive pulmonary disease [2].

Asthma is the major non-communicable disease globally. About 235 million people are affected by Asthma globally [3]. Studies suggest that an additional 100 million people may be living with asthma by 2025 [1]. Asthma is one of the most common childhood diseases [3, 4]. Most asthma-related deaths occur in low- and lower-middle income countries [3]. In South Africa, Asthma prevalence is estimated to be on the region of “5.1 - 7.1%” of the population [6]. Asthma is one of the commonest childhood diseases in South Africa as well [4].

Chronic obstructive pulmonary disease (COPD) is estimated to have caused about 3 million deaths globally in 2015 (that is, 5% of all deaths globally in 2015). COPD prevalence is estimated to likely increase in coming years due to higher smoking prevalence and aging populations in many countries [7].

The prevalence of bronchiectasis is unknown largely because the symptoms are variable and the diagnosis is often not easily made. Cases of bronchiectasis are more common in women than men [8].

### **2.2 Cardiovascular conditions**

Cardiovascular conditions are the number 1 cause of death globally. More people die annually from CVDs than from any other cause [9]. More than 17 million people die annually from cardiovascular disease [10]. Cardiovascular diseases that are covered in the CDL include cardiomyopathy (CMY), ischaemic heart disease (IHD), dysrhythmias (DYS) and hypertension (HYP).

A review of heart diseases in Africa shows that the cardiomyopathies continue to be important causes of morbidity and mortality in the population [11]. 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 [12].

The epidemiology of ischaemic heart disease (IHD) in Sub Saharan Africa (SSA) remains largely enigmatic. Major obstacles to the understanding of the condition include amongst others lack of reliable health statistics [13]. Ischaemic heart disease continues to be rare in Africa [11]. Although IHD in Sub Saharan Africa remains relatively uncommon, its prevalence is predicted to rise due to the rising prevalence of risk factors, especially hypertension, diabetes, overweight and obesity, physical inactivity, increased tobacco use and dyslipidaemia [13].

High blood pressure / hypertension is a leading risk factor for cardiovascular diseases such as heart attacks and strokes, and it is treatable. It is estimated that the number of people in the world with hypertension is around 1.13 billion, nearly doubling since 1975 [14]. HYP is a highly prevalent condition in South Africa [14]. In South Africa, HYP is estimated to be affecting about 4.4 million people as estimated by the Statistics South Africa [15].

## **2.3 Chronic renal disease**

About 10% of the population worldwide is affected by chronic kidney diseases. Access to affordable treatment remains a challenge globally [16]. In middle-income countries, renal replacement therapy remains unaffordable for the majority of patients [17]. Over 2 million people worldwide currently receive treatment with dialysis or a kidney transplant to stay alive, yet this number may only represent 10% of people who actually need treatment to live [16].

There is a lack of renal registries in majority of countries in Africa which means that there are no reliable statistics about the prevalence of chronic kidney disease and end stage renal disease in the majority of African countries [18]. Chronic kidney diseases are however estimated to affect as much as 15% of the South African population [19].

## **2.4 Gastrointestinal disorders**

Gastrointestinal disorders covered as PMBs include inflammatory bowel diseases such as Crohn's disease and Ulcerative Colitis [12]. According to epidemiological investigations, the prevalence of Crohn's disease (CSD) in industrialized countries is higher than developing countries. However, in recent years the rate of CSD in industrialized countries has been stabilized while the number of patients with CSD is rising up in developing countries. The progression of CSD in developing countries is related to changes in people's lifestyle [20].



The predominant age range of patients with CSD is reported between 20 and 30; but it can happen at any age [20]. Data on the prevalence of gastrointestinal disorders (including inflammatory bowel diseases) in South Africa is scarce [12].

## **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. DM2 occurs most commonly in people over age 40 [12].

The number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014. Diabetes prevalence has been rising more rapidly in middle- and low-income countries. Over the past decade, diabetes prevalence has risen faster in low- and middle-income countries than in high-income countries. About 25 million people in Africa region were affected by diabetes (as by 2014 data) [21]. The International Diabetes Federation show that the prevalence of adults with type 2 diabetes mellitus (DM) is highest in low and middle income countries, with Sub-Saharan Africa and the Indian subcontinent being highlighted as two of the regions where this rise is expected to be the greatest [22].

## **2.6 Psychiatric conditions**

Psychiatric health is an integral part of health and well-being as reflected in the constitution of the World Health Organisation. The WHO included mental health as part of the Sustainable Development Goals in 2015. The gap between the need for treatment and its provision is wide all over the world. In low- and middle-income countries, between 76% and 85% of people with mental disorders receive no treatment for their disorder [23].

The two psychiatric disorders, Bipolar Mood Disorder (BMD) and Schizophrenia (SCZ) form part of the 26 chronic diseases covered as PMBs in South Africa. The WHO estimates that about 60 million people are affected by bipolar effective disorder while around schizophrenia affects about 21 million people globally [23]. Epidemiological data on psychiatric conditions in South Africa is lacking and estimates are not easy to establish [24].

## **2.7 Neurological disorders**

The two neurological disorders, Epilepsy (EPL) and multiple sclerosis (MSS) form part of the 26 chronic diseases covered as PMBs in South Africa.

Epilepsy is one of the most common neurological conditions globally, estimated to constitute 0.75% of the global burden of disease. Nearly 90% of this burden occurs in low- and middle- income countries. Epilepsy is estimated to affect 69 million individuals globally [25]. There are however few large, population-based studies of the prevalence and risk factors for epilepsy in southern Africa [26].

Multiple sclerosis (MSS) is the most common disabling neurological disorder of young adults around the world. It is typically diagnosed between the ages of 20 and 40, thus affecting individuals in their most productive years [27]. According to Atlas of MS, the estimated number of people with MSS increased from 2.1 million in 2008 to 2.3 million in 2013 [28].

The ratio of male to female individuals affected by MSS is 2:1 and has remained unchanged since 2008. According to Multiple Sclerosis International Federation (MSIF), MSS prevalence in South Africa is estimated to be at the region of '0 – 5' per 100 000 people [29].

## **2.8 Auto-Immune conditions**

Rheumatoid Arthritis (RHA) is a chronic systemic disease that affects the joints, connective tissues, muscle, tendons, and fibrous tissue. RHA tends to strike between the ages of 20 and 40, and is a chronic disabling condition often causing pain and deformity [30]. RHA is more prevalent in females than males and with increasing age [31].

Globally, RHA prevalence varies between 0.3% and 1% [30]. There is a lack of a formal meta-analysis on RHA prevalence rates in the Sub Saharan African region due to limited data [31].

Systemic Lupus Erythematosus (SLE) is a multisystem autoimmune disease characterised by the formation of antinuclear antibodies [32]. SLE is primarily a disease of young women [33]. Females are affected by SLE far more than males (about 4 to 12 females for every male). SLE tend to peak in the childbearing years for females [33]. The reported worldwide incidence and prevalence of SLE vary considerably; this variation is probably attributable to a variety of factors, including ethnic and geographic differences in the populations being studied, the definition of SLE applied, and the methods of case identification [34]. SLE incidence is estimated to be ranging from 2.0 to 7.6 per 100,000 with prevalence of 20 to 50 per 100,000. Approximately 15-20% of SLE occurs before the age of 19 years [32].

## **2.9 Addison's disease**

Addison's disease (ADS) is a rare chronic disease leading to a deficient production of glucocorticoids, mineralocorticoids, and androgens in the adrenal cortex. ADS is a rare disease and epidemiological data are difficult to collect [35]. There is a paucity of information as to the epidemiology of ADS from the developing world [34]. Studies however, estimates South African prevalence of ADS to be 3.1 per million [36].

## **2.10 Diabetes Insipidus**

Diabetes Insipidus (DBI) is an uncommon condition in South Africa. The prevalence of DBI is unknown in South Africa [12].

## **2.11 Glaucoma**

The global overall glaucoma prevalence was 3.54% in 2013 [37]. The number of people (aged 40–80 years) with glaucoma worldwide was estimated to be 64.3 million in 2013, this number is expected to increase to 76.0 million in 2020 and 111.8 million in 2040. The predicted increase in glaucoma prevalence is predicted to disproportionately affect people residing in Asia and Africa [38]. The worldwide prevalence of GLC is expected to increase as a result of the rapidly aging population [12].

## **2.12 Haemophilia**

Haemophilia has greater prominence in males than in females [40]. About 1 in 10 000 people are born with haemophilia [39]. In South Africa, it is estimated that there are less than 0.1 per 1000 infants with a major haemoglobinopathy [40].

### **2.13 Parkinson's**

Parkinson's disease (PAR) is the most common neurological disease after Alzheimer's disease [12]. Generally, there have been few studies of Parkinson's disease conducted in Africa leading to concerns that Parkinson's disease (PAR) is under-studied in Sub Saharan African [41]. Little is known about the epidemiology of PAR in South Africa [12].

### **2.14 Hypothyroidism**

Thyroid dysfunction is one of the leading endocrine disorders globally [43]. Women are more affected by thyroid dysfunctions than men [44]. Hypothyroidism is more common in older women and increases with age [12]. The world-wide prevalence of hypothyroidism is estimated to be around 5% [42].

## 3 Methodology

### 3.1 Data sources

This study relied on the data that was submitted by medical schemes as part of Annual Statutory Returns (ASR). Prior reports were based on data that was submitted voluntarily by the medical schemes for the purposes of SRM. In 2015, the CMS incorporated the data that was previously submitted for SRM purposes into ASR system. The separate submission of data for SRM purposes was then discontinued in 2015.

This report was compiled using the data that was submitted through the ASR system in 2016. The study mainly relied on the data that was submitted as part A7 (Scheme risk measurement data) and part C5 (CDL prevalence & registration on a chronic disease program) of the ASR system [48]. It is for the first time that this report is based entirely on the ASR data.

This report defines prevalence in two different methods depending on the database that the data was extracted from. The first part (section 1 to section 5) defines prevalence using the SRM definition while the second part (Annexure A) uses a more relaxed definition of prevalence which is a count of beneficiaries who have had at-least one claim for specified CDL condition during the year. The two definitions are explained in more detail in the sections below:

#### **SRM prevalence definition**

The first part (section 1 to section 5) of the report defines prevalence as diagnosed and treated prevalence as defined by the SRM process (this data was extracted from part A7 of the ASR system). Medical schemes use the rules set out in the *“Guidelines for the Identification of Beneficiaries with Risk Factors in Accordance with the Entry and Verification Criteria v9.1”* (Council for Medical Schemes, 2015) to identify each chronic disease case.

The purpose of the entry and verification criteria is to define the criteria, which must be met in the identification of beneficiaries with the risk factors used in the SRM (the criteria is intended for this purpose only and not to be construed as limitations or expansions to PMBs in terms of the Medical Schemes Act). The entry and verification criteria were developed with emphasis on the verifiability of cases and is used to ensure that there is uniformity in the way that medical schemes identify SRM risk factors. The criteria basically indicate that prevalence refers to beneficiaries which are diagnosed and treated for a condition, these beneficiaries are registered on a program and there should be proof of payment from the risk pool.

## **Annexure A prevalence definition**

Annexure A of this report provides tables for a more relaxed definition of prevalence. This is the count of beneficiaries who have had at-least one claim for a specified CDL condition during the year (this data is extracted from table C5 of the ASR system). This data was collected for the first time for 2015 in 2016 and as a result CMS will monitor the quality of the data as time progresses. A more detailed analysis of this data will be provided in the up-coming studies once enough data is available (to conduct data quality tests using trend).

### **3.2 Analytical approach**

Prevalence in this report is calculated as an annual average prevalence based on the average annual number of beneficiaries in the year. This methodology is similar to the methodology used in the 2015 report (covering the period 2009 to 2014). In the 2013 study covering the period 2006 to 2011, prevalence rates were calculated using prevalence for the month of June each year. The difference between these two approaches is not significant, but caution should be exercised when comparing the findings of the different reports.

The “*Guidelines for the Identification of Beneficiaries with Risk Factors in Accordance with the Entry and Verification Criteria v8.1*” (Council for Medical Schemes, 2015) was used as a guideline in analysing the results. According to these guidelines, the age band “Under 1” is not populated with CDL or HIV information, all beneficiaries under one with CDL’s are included in the “NON” category. Hence, all CDL and HIV prevalence for the “Under 1” age band is zero. The treatment of beneficiaries in the age band “Under 1” was also applied to a relaxed prevalence definition as discussed in Annexure A of this report.

Section 4.4 of this report contains data on the multiple CDL conditions (or HIV/AIDS and one or more CDL conditions). These rates are calculated using “modifiers”. Modifiers refer to beneficiaries with more than one CDL condition. For the purposes of SRM, beneficiaries with two (CC2), three (CC3) or four (CC4) or more simultaneous CDL conditions are counted separately. The count of modifiers in each category is then used to calculate prevalence expressed per 1000 beneficiaries. This calculation is only applicable to section 4.4 of this report.

The prevalence rates for rare CDL conditions such as MSS, HAE, DBI, etc. may appear volatile when depicted on a graph. This may be due to the fact that these conditions prevalence rates are low and as a result, small changes in the rate is most likely to cause volatility. The graphs of these conditions are to be interpreted with caution.

All prevalence statistics in the report was analysed at a two digit level. There are instances where the reported percentage changes do not necessarily add up to the calculated prevalence movement. This discrepancy is mainly caused by rounding off and do not affect the validity of the reported statistics.

### 3.3 Sampling

Only data that was deemed to be of acceptable quality through the CMS ASR data quality evaluation process was included in the analysis. The proportion of beneficiaries whose data was sampled (or used) was above 97% for the 2015 data. The chronic diseases that were analysed in this study are as given in Table 2 below with the acronyms used for each chronic disease.

**Table 2: Chronic diseases in the Chronic Disease List**

Chronic Disease Code	Full Description
ADS	Addison's Disease
AST	Asthma
BCE	Bronchiectasis
BMD	Bipolar Mood Disorder
CHF	Cardiac failure <sup>2</sup>
CMY	Cardiomyopathy
COPD	Chronic Obs. Pulmonary Disease
CRF	Chronic Renal Disease
CSD	Crohn's Disease
DBI	Diabetes Insipidus
DM1	Diabetes Mellitus 1
DM2	Diabetes Mellitus 2
DYS	Dysrhythmias
EPL	Epilepsy
GLC	Glaucoma
HAE	Haemophilia
HYL	Hyperlipidaemia
HYP	Hypertension
IBD	Ulcerative Colitis
IHD	Coronary Artery Disease
MSS	Multiple Sclerosis
PAR	Parkinson's Disease
RHA	Rheumatoid Arthritis
SCZ	Schizophrenia
SLE	Systemic Lupus Erythematosus
TDH	Hypothyroidism
HIV/AIDS	HIV/AIDS <sup>3</sup>

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<sup>2</sup> CHF was combined with CMY in the prevalence tables.

<sup>3</sup> Not a CDL condition.

## 4 Results

### 4.1 Scheme demographics

The demographic information of beneficiaries of all medical schemes are shown in Table 3. The number of beneficiaries in all schemes decreased by -0.06%, the average age increased from 32.1 to 32.3, and the pensioner ratio increased from 7.3% in 2013 to 7.7% in 2015.

The number of beneficiaries in restricted schemes decreased by -1.11% with the average age and pensioner ratio increasing by 0.3 and 0.2 percentage points, respectively. The number of beneficiaries in open schemes grew by 0.79% with the average age increasing by 0.2 percentage points, while the pensioner ratio increased slightly between 2014 and 2015.

**Table 3: Medical schemes demographics 2015 (all beneficiaries, Annual Statutory Returns)**

Attribute	Restricted			Open			Total		
	2014	2015	% change	2014	2015	% change	2014	2015	% change
Lives	3 914 483	3 871 070	-1.11	4 899 975	4 938 453	0.79%	8 814 458	8 8095 23	-0.06
Average age	30.2	30.5	0.3	33.6	33.8	0.2	32.1	32.3	0.2
Pensioner ratio (%)	5.9	6.1	0.2	8.5	8.8	0.3	7.3	7.7	0.4

**Table 4: Medical schemes demographics 2015 (sampled data, SRM database)**

Attribute	Restricted			Open			Total		
	Total	Sampled	% Proportion	Total	Sampled	% Proportion	Total	Sampled	% Proportion
Lives	3 871 070	3 803 991	98.3	4 938 453	4 813 087	97.5	8 8095 23	8 617 078	97.8
Average age	30.5	30.3		33.8	33.8		32.3	32.2	
Pensioner ratio (%)	6.1	5.9		8.8	8.8		7.7	7.6	



## 4.2 Treated CDL and HIV/AIDS prevalence per scheme type

The 2014 and 2015 average prevalence per 1 000 beneficiaries for the 26 CDL conditions in open and restricted schemes are depicted in Table 5 below. Cardiomyopathy (CMY) and cardiac heart failure (CHF) are reported together as per SRM Entry and Verification criteria.

**Table 5: Average prevalence per 1 000 beneficiaries for the treated 26 CDL conditions and HIV/AIDS**

Chronic Disease Code	2015 industry rank (2014)	Restricted			Open			Total		
		2014	2015	% change	2014	2015	% change	2014	2015	% change
ADS	24 (24)	0.03	0.03	-11.2%	0.08	0.08	9.9%	0.06	0.06	5.2%
AST	4 (5)	16.35	17.65	8.0%	15.89	16.74	5.3%	16.09	17.13	6.5%
BCE	23 (23)	0.06	0.06	9.9%	0.09	0.10	14.7%	0.07	0.08	13.6%
BMD	10 (10)	2.61	2.97	14.0%	4.13	4.74	14.7%	3.45	3.97	15.0%
CMY & CHF	8 (8)	6.13	6.49	5.9%	4.90	5.21	6.3%	5.45	5.77	5.8%
COP	15 (16)	0.97	1.06	9.2%	1.52	1.71	12.6%	1.28	1.43	12.0%
CRF	19 (18)	0.44	0.21	-52.5%	0.57	0.70	22.3%	0.52	0.49	-5.3%
CSD	22 (22)	0.11	0.08	-24.0%	0.28	0.31	9.0%	0.20	0.21	2.5%
DBI	25 (25)	0.04	0.05	42.2%	0.03	0.03	14.0%	0.03	0.04	28.1%
DM1	14 (14)	2.02	2.09	3.2%	2.03	2.12	4.1%	2.03	2.10	3.7%
DM2	3 (3)	32.75	36.90	12.7%	24.04	26.86	11.7%	27.91	31.21	11.8%
DYS	11 (11)	2.61	2.93	12.3%	3.74	4.30	15.1%	3.24	3.71	14.5%
EPL	9 (9)	4.31	4.63	7.5%	4.41	4.66	5.7%	4.36	4.65	6.5%
GLC	12 (13)	2.78	3.15	13.4%	3.15	3.56	13.0%	2.98	3.38	13.3%
HAE	26 (26)	0.01	0.01	0.0%	0.03	0.03	5.7%	0.02	0.02	10.1%
HYL	2 (2)	30.80	24.72	-19.7%	39.11	42.71	9.2%	35.41	34.90	-1.4%
HYP	1 (1)	91.95	100.08	8.8%	86.76	92.96	7.1%	89.07	96.05	7.8%
IBD	16 (15)	2.23	2.08	-6.8%	0.52	0.58	10.3%	1.28	1.23	-4.2%
IHD	7 (7)	5.94	6.31	6.2%	8.35	9.19	10.1%	7.28	7.94	9.1%
MSS	21 (21)	0.24	0.25	2.9%	0.23	0.27	15.6%	0.23	0.26	9.9%
PAR	17 (17)	0.72	0.80	11.3%	0.85	0.95	11.6%	0.79	0.88	11.7%
RHA	13 (12)	3.29	3.58	8.6%	2.90	3.21	10.7%	3.07	3.37	9.6%
SCZ	18 (19)	0.50	0.54	7.5%	0.46	0.51	10.8%	0.48	0.52	9.2%
SLE	20 (20)	0.27	0.18	-32.8%	0.37	0.42	14.4%	0.33	0.32	-2.3%
TDH	6 (6)	14.60	15.92	9.0%	14.89	16.49	10.7%	14.76	16.24	10.0%
HIV	5 (4)	30.47	26.01	-14.6%	13.35	12.72	-4.8%	20.96	16.40	-21.8%

**\*\* All data for 2014 has been revised. Also note that Percentage changes may not add-up due to rounding**

The prevalence rank of many treated CDL conditions has remained unchanged between 2014 and 2015. The top 10 CDL conditions did not change significantly between 2014 and 2015.

Prevalence of treated CDL conditions is generally higher in open medical schemes as opposed to restricted medical schemes. The prevalence rate for HIV/AIDS in restricted schemes is more than double the corresponding prevalence in open medical schemes (Table 5). Detailed changes in CDL conditions as well as HIV/AIDS are discussed in more detail in the next section.

### **4.3 Treated CDL and HIV/AIDS prevalence by age and gender**

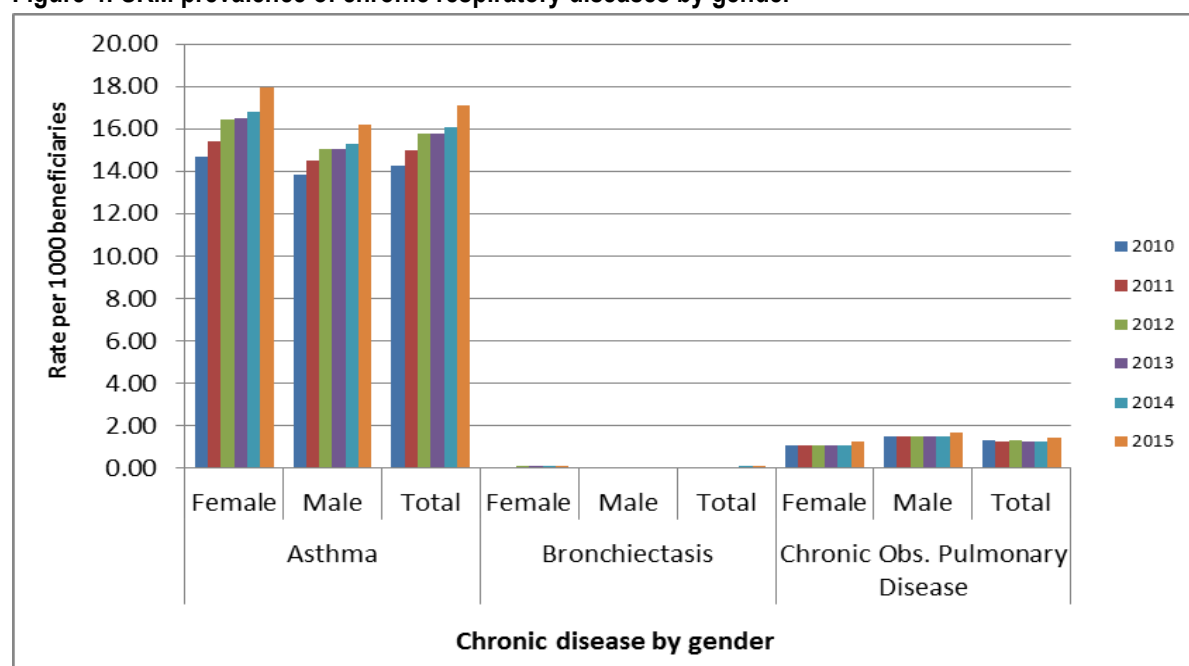
#### **4.3.1 Chronic respiratory conditions**

Figure 4 shows prevalence of treated chronic respiratory diseases in medical scheme beneficiaries by gender. The overall prevalence of asthma (AST) increased from 14.65 per 1 000 in 2010 to 17.13 per 1 000 in 2015. AST rates were slightly higher in female beneficiaries as opposed to male beneficiaries.

The treated chronic obstructive pulmonary disease (COPD) prevalence rate increased between 2010 and 2015. The overall prevalence for treated COPD increased from 1.28 per 1 000 in 2010 to 1.42 per 1 000 in 2015. This represents an increase of 11.4% for the period between 2010 and 2015. More male than female beneficiaries were treated for COPD. In 2015, about 1.64 per 1 000 males received COPD treatment while 1.23 per 1 000 females received treatment.

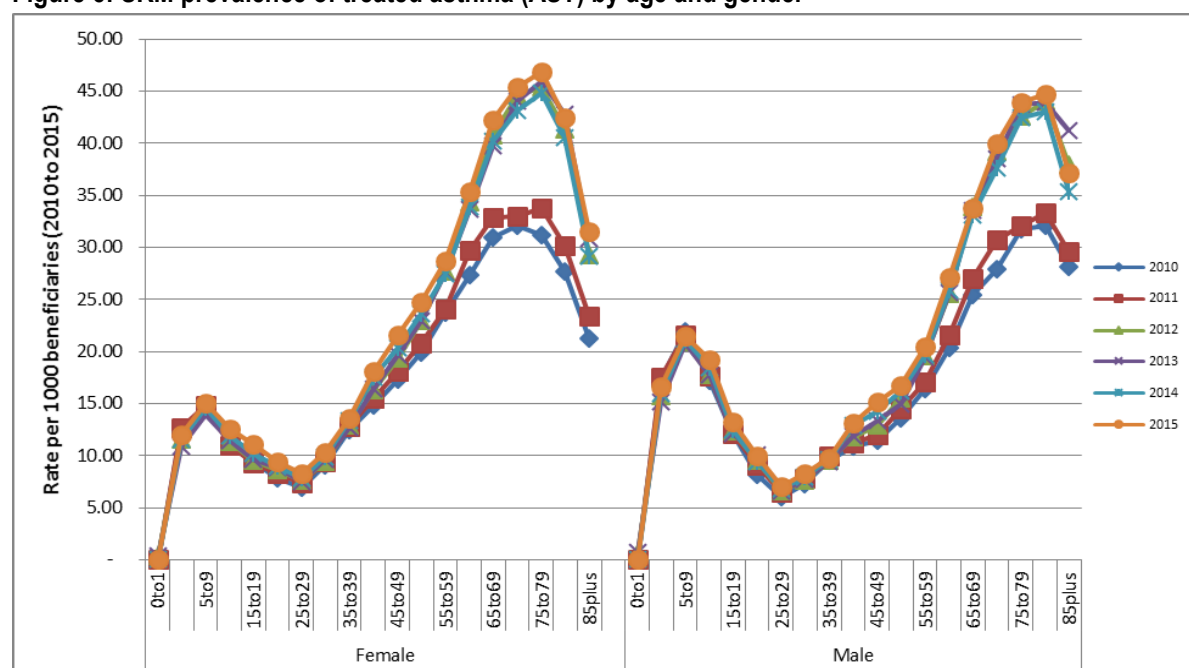
The overall prevalence of treated Bronchiectasis (BCE) has remained unchanged at about 0.1 per 1 000 between 2010 and 2015 (Figure 4).

**Figure 4: SRM prevalence of chronic respiratory diseases by gender**



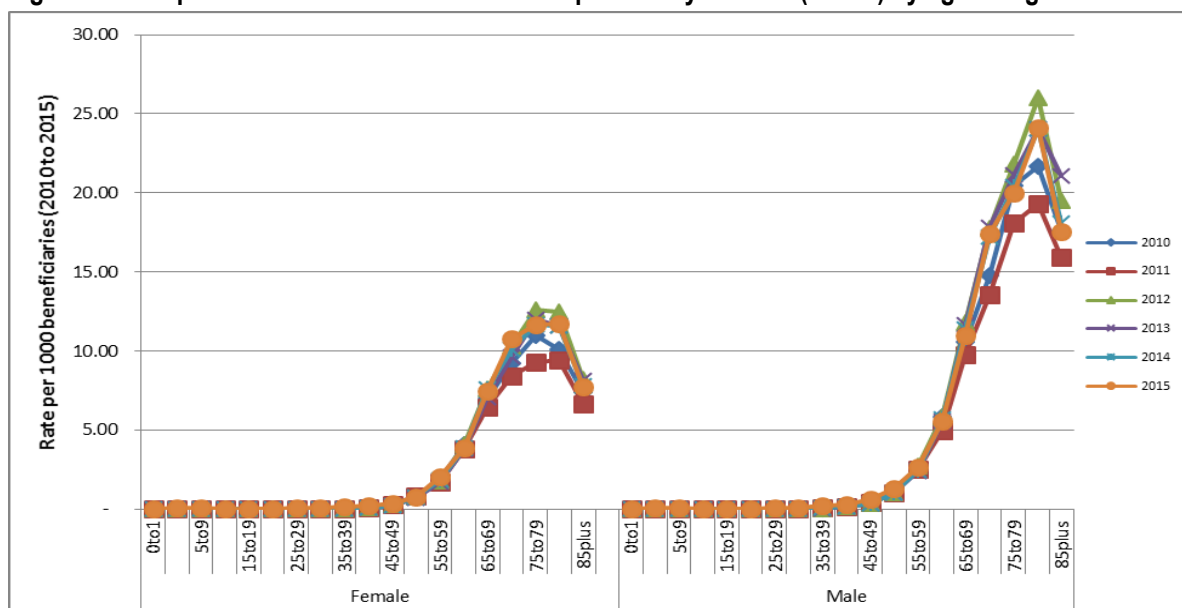
Treated AST prevalence by age as depicted in Figure 5, indicates that asthma is highly prevalent in older age groups. The prevalence rate for female and male beneficiaries older than 55 years has always been above 15 per 1 000 beneficiaries. The female and male beneficiaries between ages 5 to 9 years have the highest asthma prevalence in the age category below 30 years.

**Figure 5: SRM prevalence of treated asthma (AST) by age and gender**



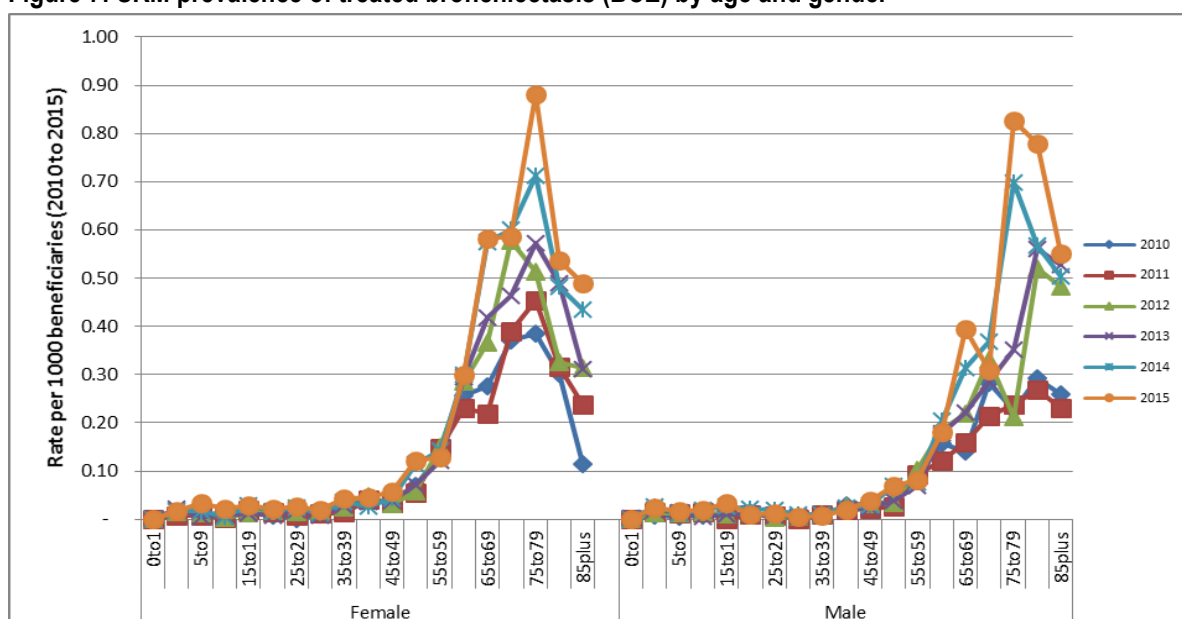
Fewer cases of treated COPD were reported in younger age groups (< 40 years). Treated COPD prevalence for the ages above 60 were all above 3 per 1 000.

**Figure 6: SRM prevalence of treated chronic obs. pulmonary disease (COPD) by age and gender**



Prevalence of treated BCE has remained unchanged at levels below 1.0 per 1 000 beneficiaries between 2010 and 2015 (Figure 7). BCE is a rare condition and resulted in volatile (not smoothed) graphs throughout the period under review.

**Figure 7: SRM prevalence of treated bronchiectasis (BCE) by age and gender**



### 4.3.2 Cardiovascular conditions

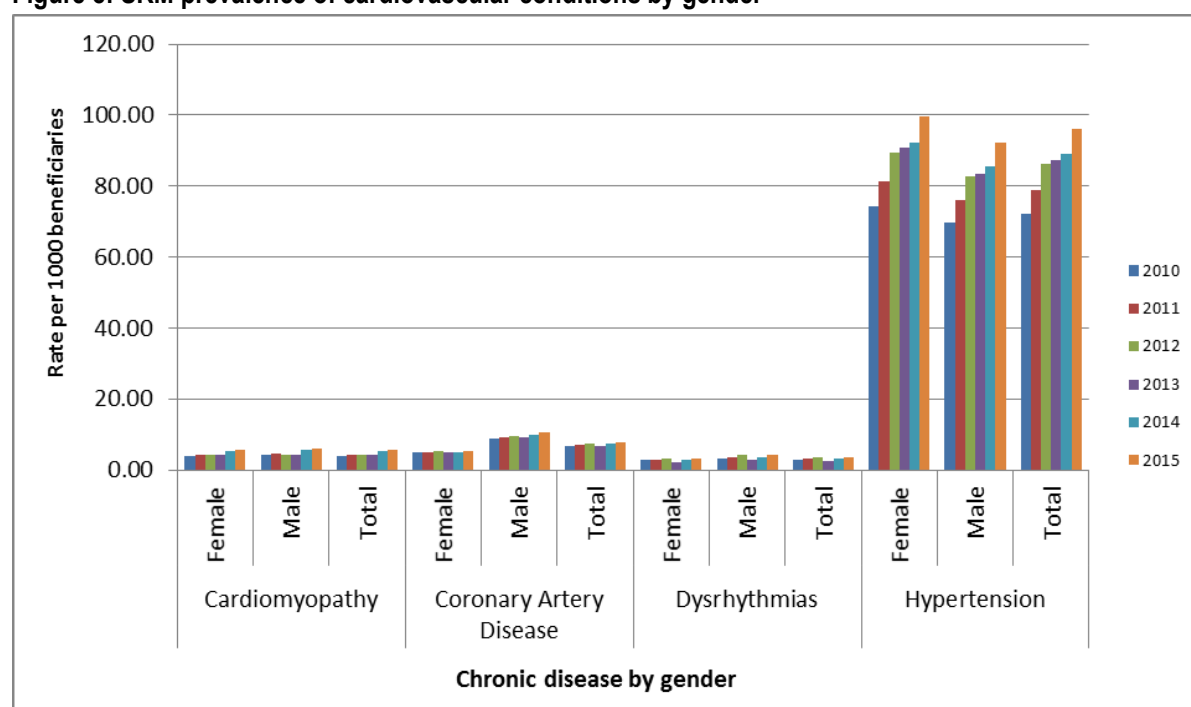
The overall prevalence of diagnosis and treatment of Cardiomyopathy (CMY) paid for by medical schemes increased slightly from 3.91 per 1 000 in 2010, to 5.76 per 1 000 in 2015. The differences by gender were not significant (Figure 8).

Nearly double the proportion of male medical schemes beneficiaries were diagnosed with coronary artery disease (IHD), compared to female beneficiaries. In 2010, treated coronary artery disease prevalence in males was 7.01 per 1 000 compared to 4.90 per 1 000 in females. The treated prevalence rates changed to 10.71 per 1 000 and 5.46 per 1 000 in 2015 for males and females respectively.

Few cases of dysrhythmias (DYS) were reported in medical schemes beneficiaries. The overall prevalence increased slightly from 3.02 per 1000 in 2010 to 3.70 per 1 000 in 2015. Small differences were observed in the prevalence rates between female and male beneficiaries.

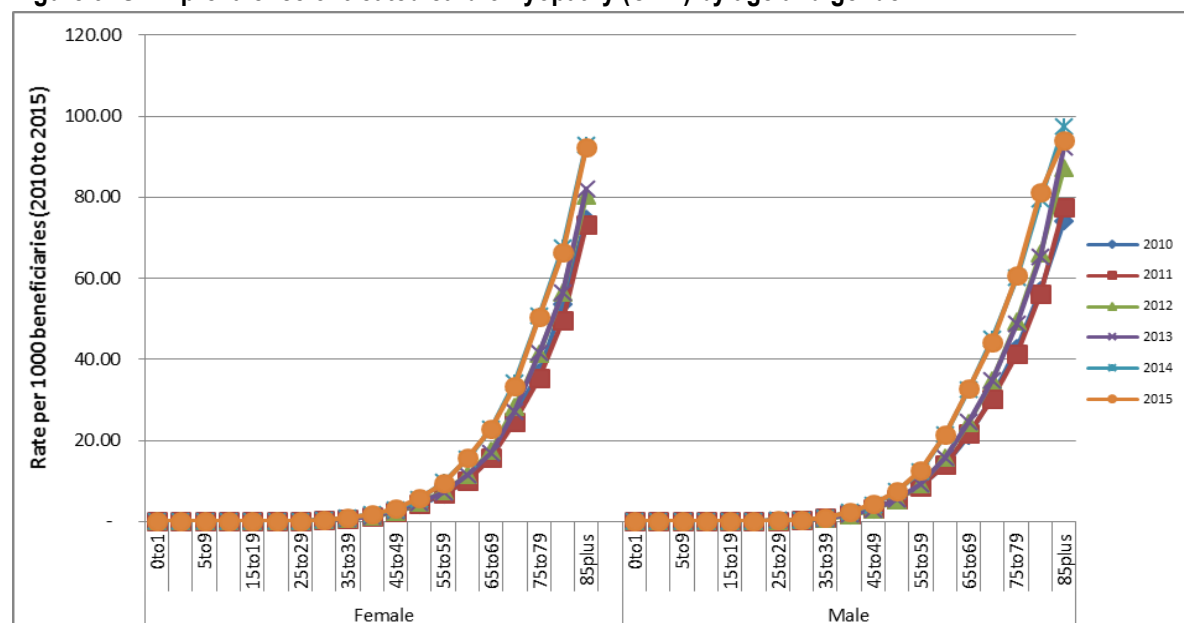
Hypertension (HYP) was the fastest increasing cardiovascular condition, increasing by 27.9% between 2010 and 2015 (from 75.09 to 96.05 per 1 000). In 2015, more female than male beneficiaries received treatment for hypertension (99.45 per 1 000 vs. 92.24 per 1 000 respectively).

**Figure 8: SRM prevalence of cardiovascular conditions by gender**



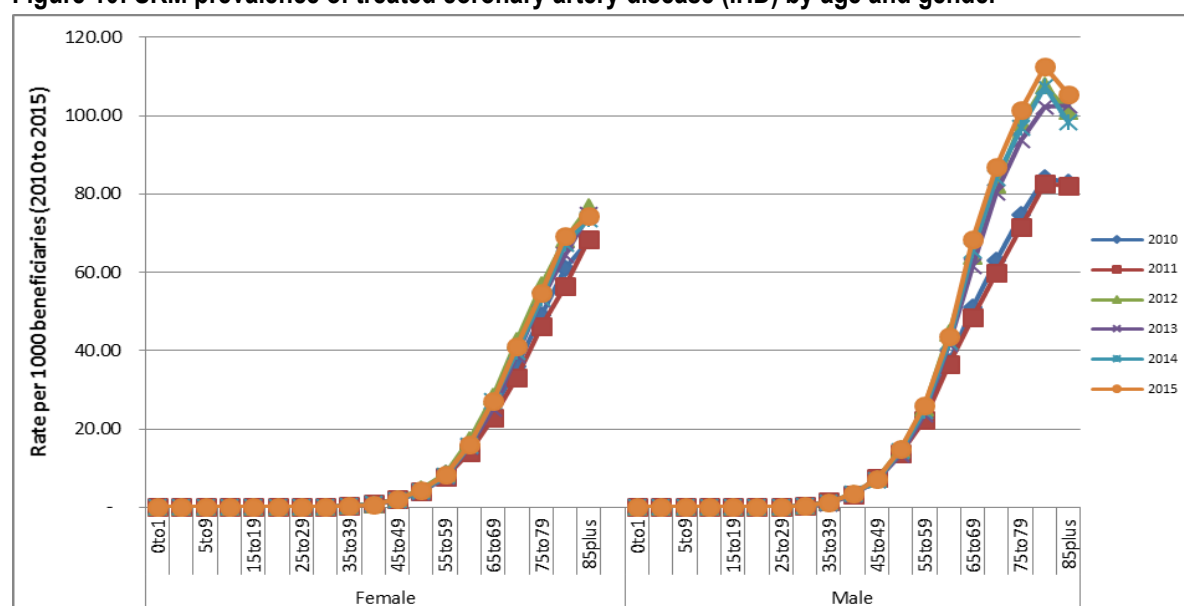
The prevalence of treated CMY has shown increases across the majority of age bands between 2010 and 2015. Very few cases of CMY were reported in younger age groups (<40 years). Similar increases were observed in male and female beneficiaries (Figure 9).

**Figure 9: SRM prevalence of treated cardiomyopathy (CMY) by age and gender**



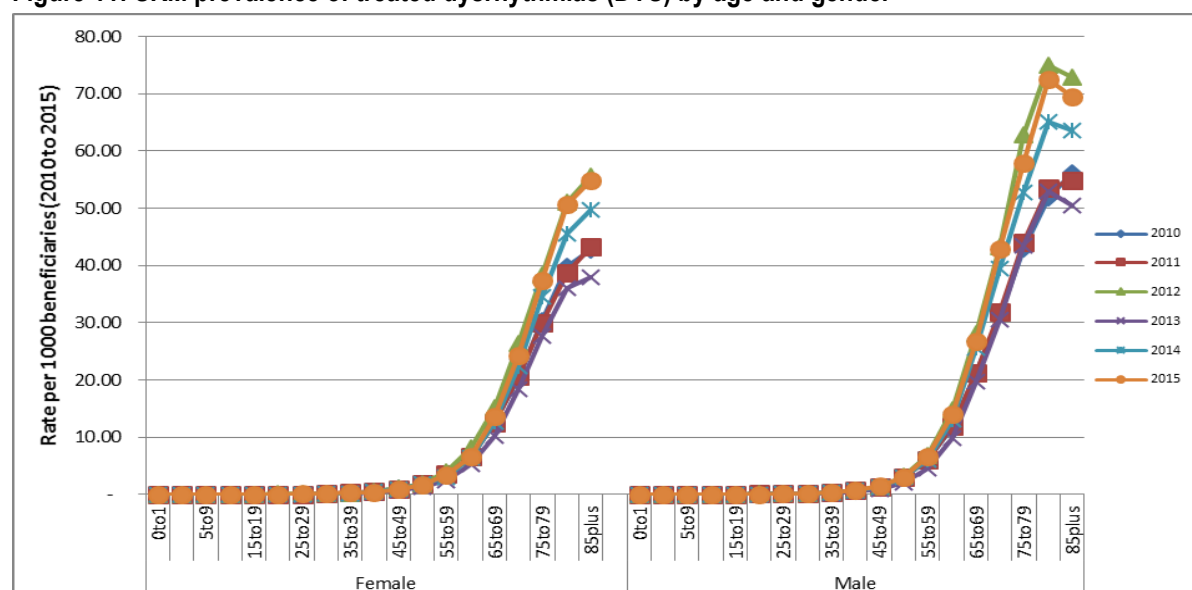
Very few cases of IHD were reported in younger age groups (<50 years). Male beneficiaries older than 50 years had higher IHD prevalence than female beneficiaries of the corresponding age group for the period under review (Figure 10).

**Figure 10: SRM prevalence of treated coronary artery disease (IHD) by age and gender**



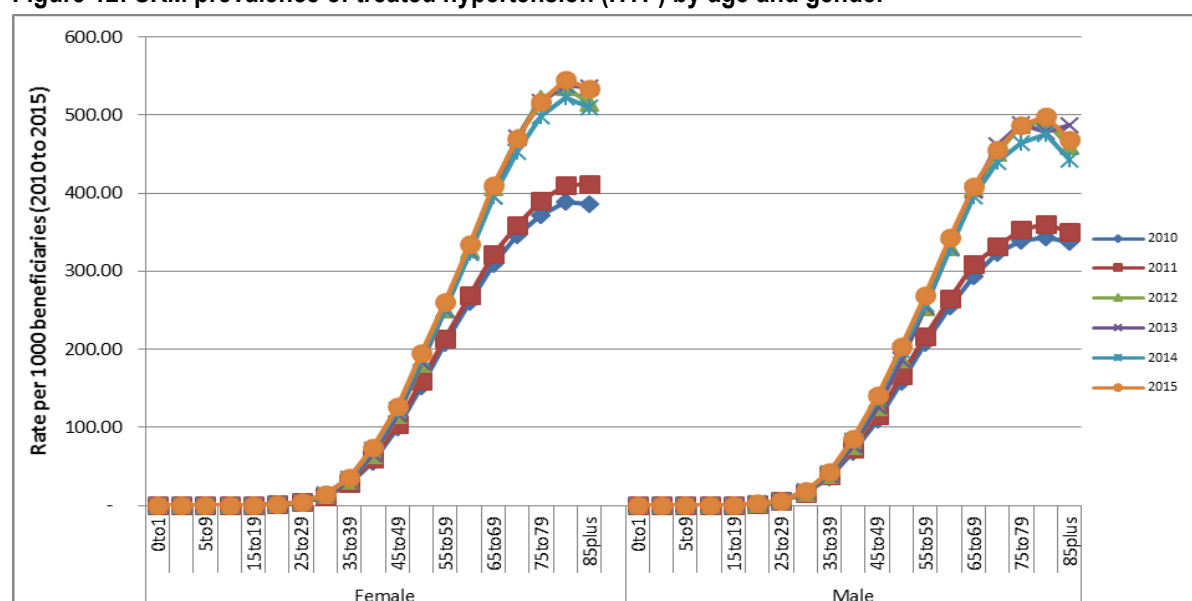
DYS is highly prevalent in older age groups (>40 years). The overall prevalence of DYS increased slightly from 3.02 in 2010 to 3.70 per 1000 in 2015 (Figure 11).

**Figure 11: SRM prevalence of treated dysrhythmias (DYS) by age and gender**



The prevalence of treated HYP has shown a consistent increase across most age groups, as depicted in Figure 12. Female beneficiaries had a higher HYP prevalence rate. HYP prevalence was higher for the age groups above 45 years. Beneficiaries above the age of 55 have HYP prevalence rate that was above 200 per 1 000 beneficiaries (for both males and females). Females above 75 years had HYP prevalence above 500 per 1000 beneficiaries. HYP retained its status as the CDL with the highest prevalence rate in the medical schemes industry.

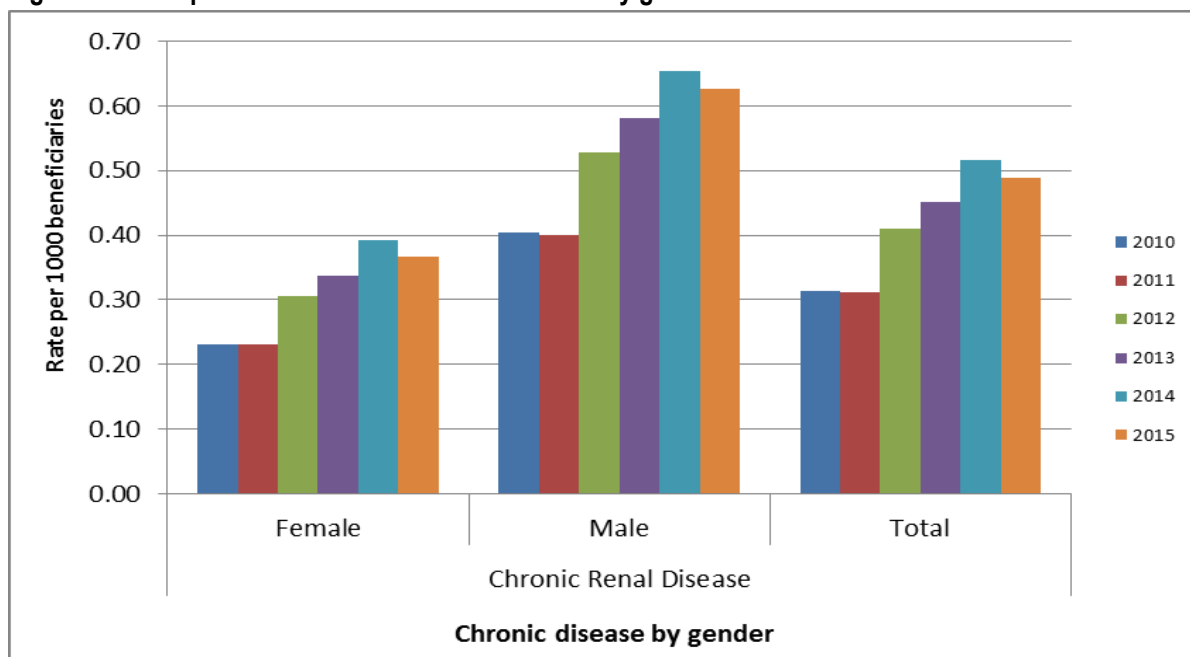
**Figure 12: SRM prevalence of treated hypertension (HYP) by age and gender**



### 4.3.3 Chronic renal disease

The overall prevalence of treated chronic renal disease (CRF) increased from 0.31 per 1 000 in 2010, to 0.48 per 1 000 in 2015. More male than female beneficiaries were treated for CRF. In 2015, the prevalence of CRF was 0.63 per 1 000 for males and 0.36 per 1 000 for females.

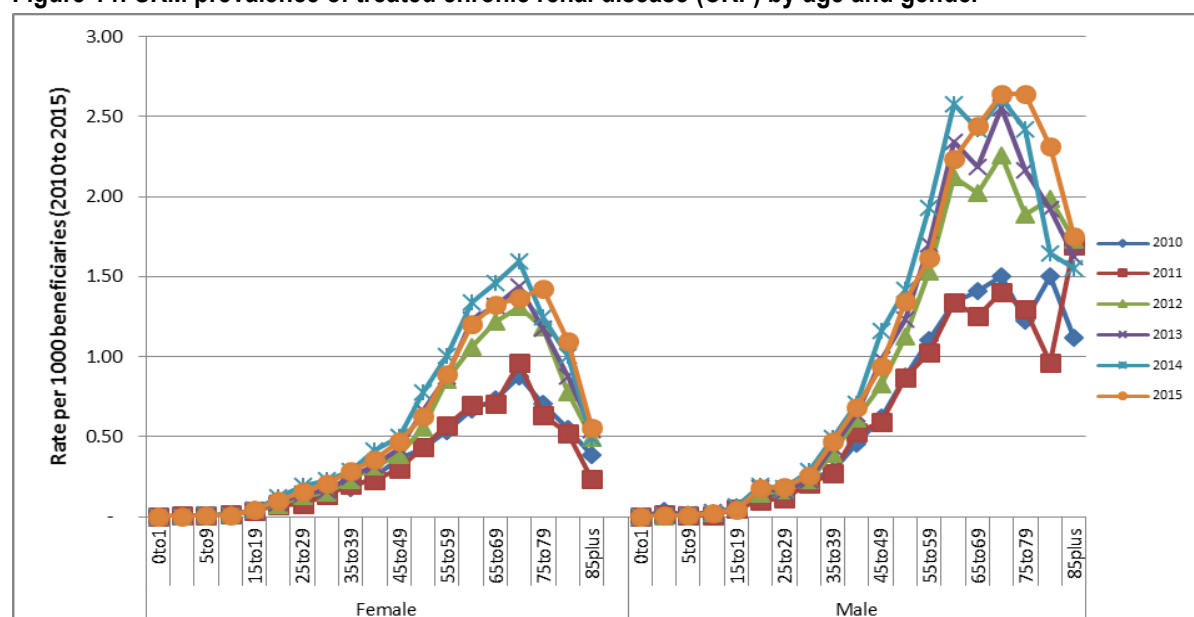
**Figure 13: SRM prevalence of chronic renal disease by gender**



The prevalence of treated CRF decreased in most age groups in 2015. Very few cases of CRF were observed in beneficiaries younger than the age of 20 years in the period under review (Figure 13 and 14).



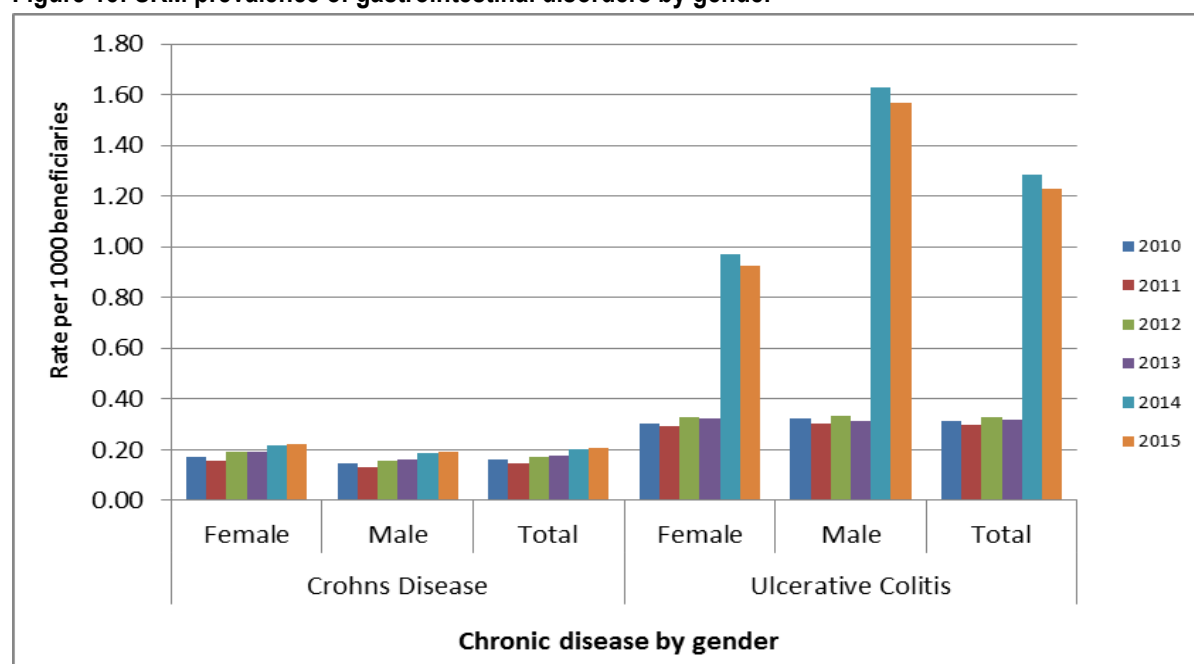
**Figure 14: SRM prevalence of treated chronic renal disease (CRF) by age and gender**



#### 4.3.4 Gastrointestinal disorders

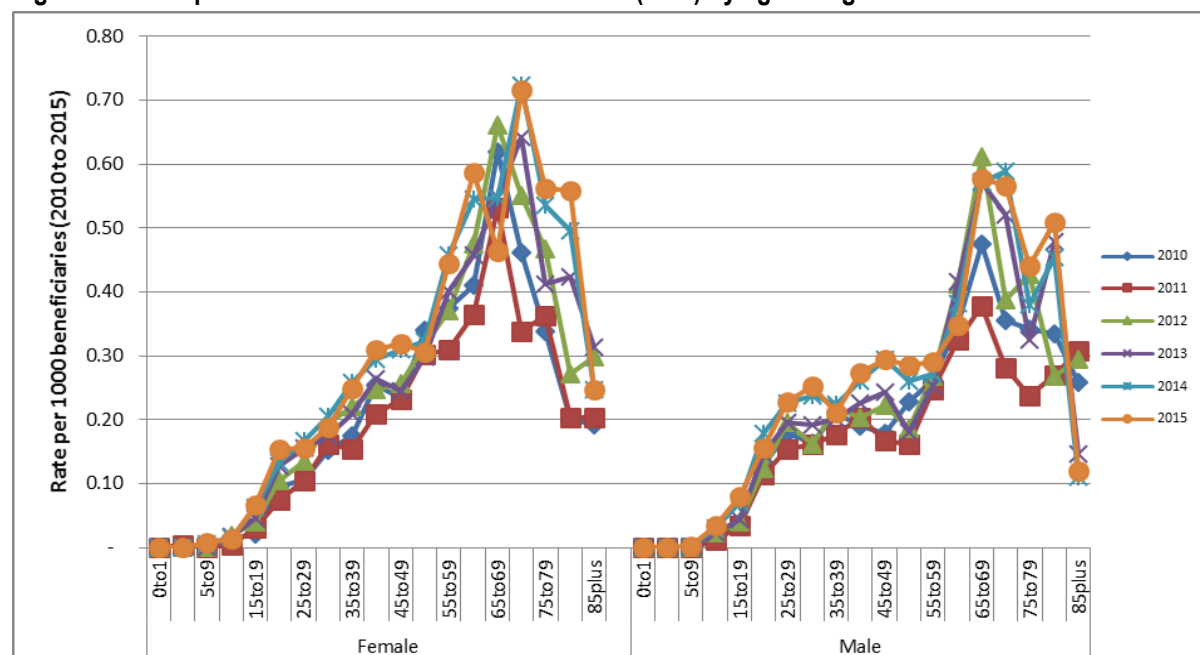
Few medical scheme beneficiaries were treated for Crohn's disease (CSD) for the period between 2010 and 2015. The prevalence of treated CSD increased from 0.16 per 1 000 in 2010 to 0.20 per 1 000 in 2015. Ulcerative colitis (IBD) is also a relatively rare condition in medical scheme members (Figure 15).

**Figure 15: SRM prevalence of gastrointestinal disorders by gender**



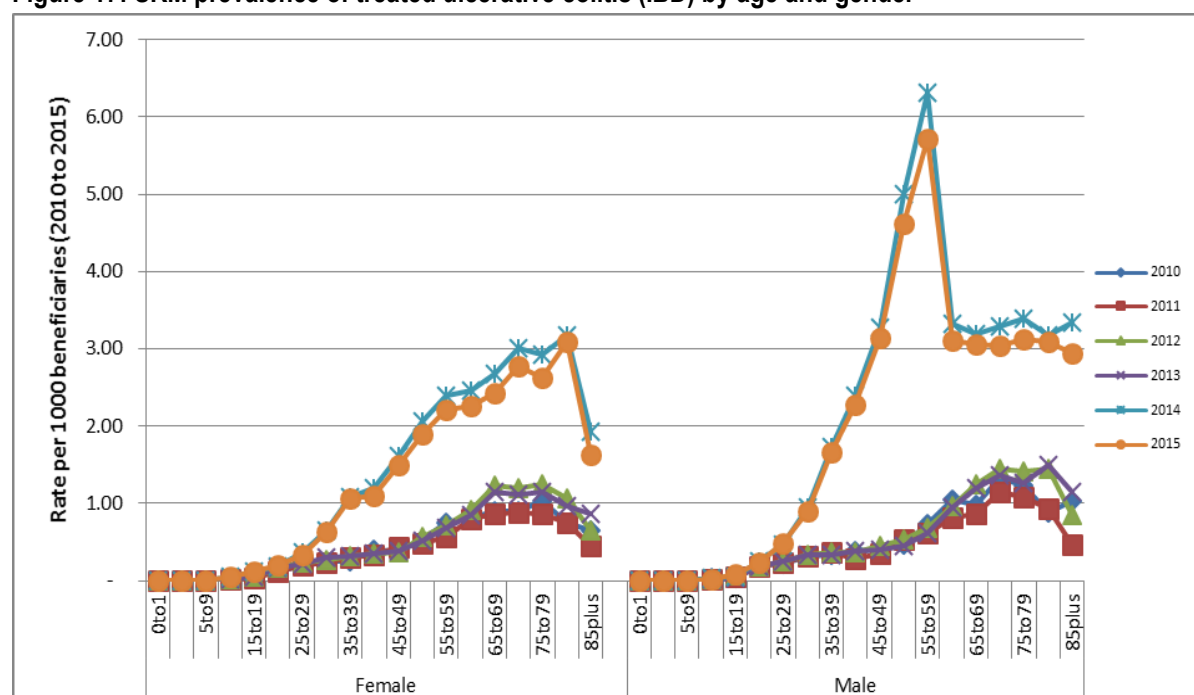
As displayed in Figure 16, very few cases of CSD were observed in child beneficiaries. CSD is a rare condition and resulted in volatile (not smoothed) graphs throughout the period under review.

**Figure 16: SRM prevalence of treated Crohn's disease (CSD) by age and gender**



The prevalence of IBD for beneficiaries below the age of 20 years remained slightly unchanged for the period between 2010 and 2015. Very few cases of IBD were observed in child beneficiaries (Figure 17). IBD is a rare condition and resulted in volatile (not smoothed) graphs throughout the period under review.

**Figure 17: SRM prevalence of treated ulcerative colitis (IBD) by age and gender**

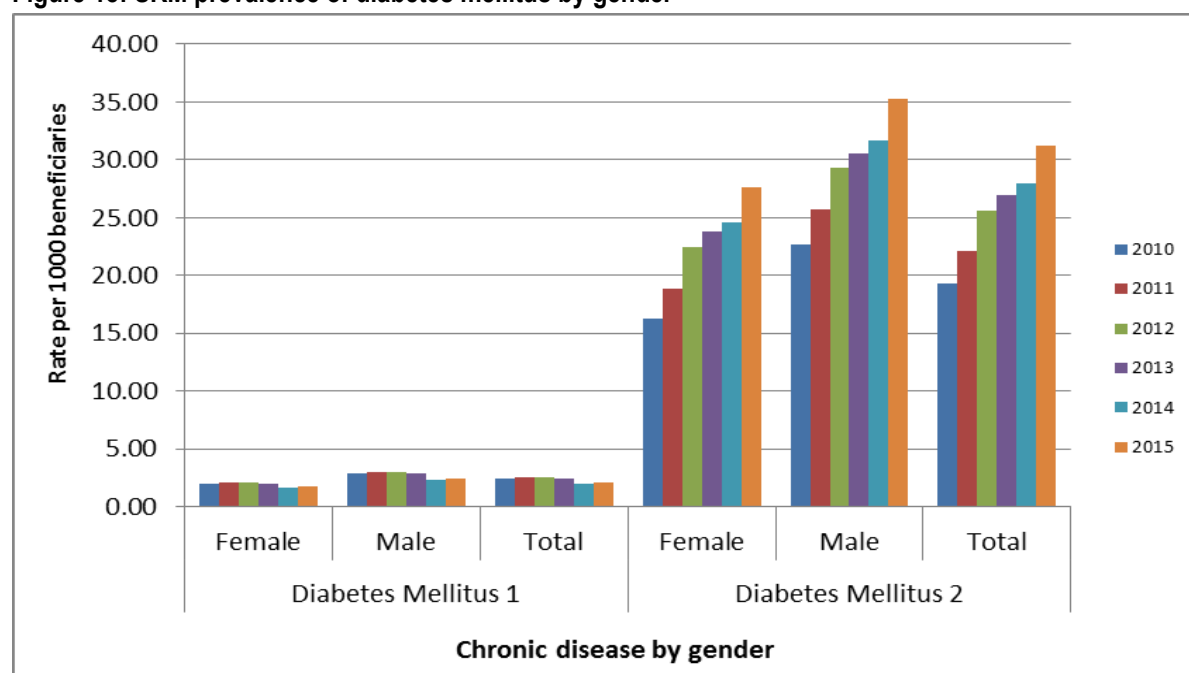


#### 4.3.5 Diabetes mellitus

The overall prevalence of diabetes mellitus type 1 (DM1) in the medical schemes population decreased slightly from 2.42 per 1 000 in 2010 to about 2.10 per 1 000 in 2015, as shown in Figure 18. More male than female beneficiaries were diagnosed and treated for DM1 (2.46 per 1 000 vs. 1.77 per 1 000) in 2015.

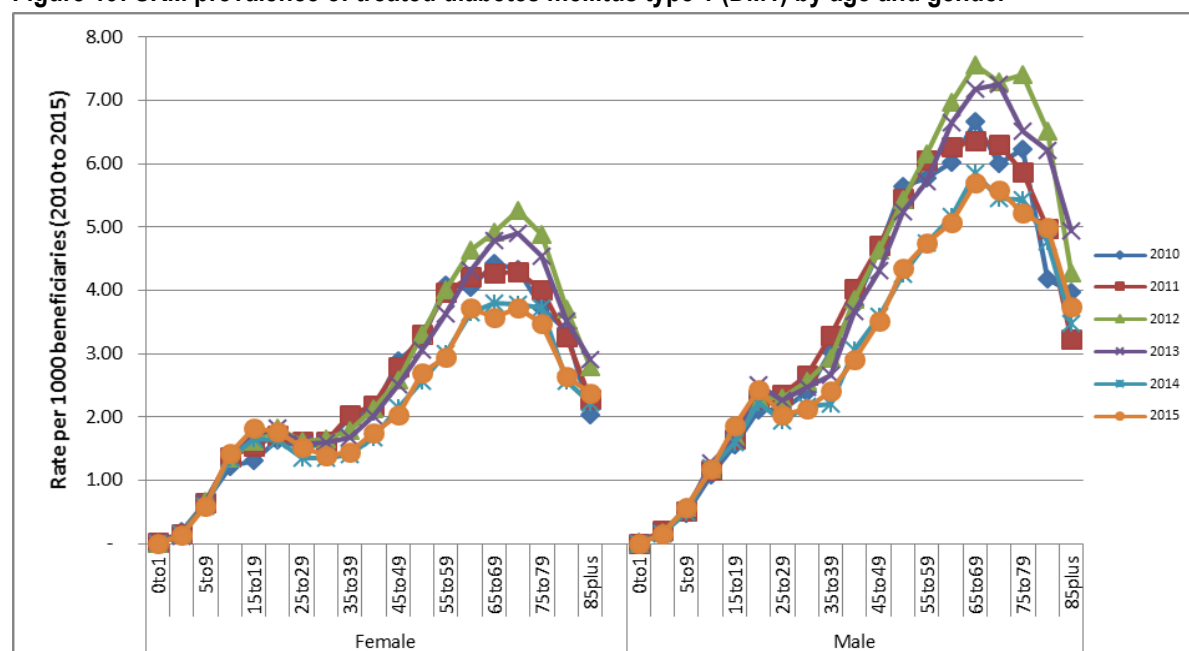
The overall prevalence of diabetes mellitus type 2 (DM2) has increased from 20.29 per 1 000 in 2010, to 31.21 per 1 000 in 2015. More male than female beneficiaries were diagnosed and treated for DM2 (35.25 per 1 000 vs. 27.59 per 1 000) in 2015.

**Figure 18: SRM prevalence of diabetes mellitus by gender**



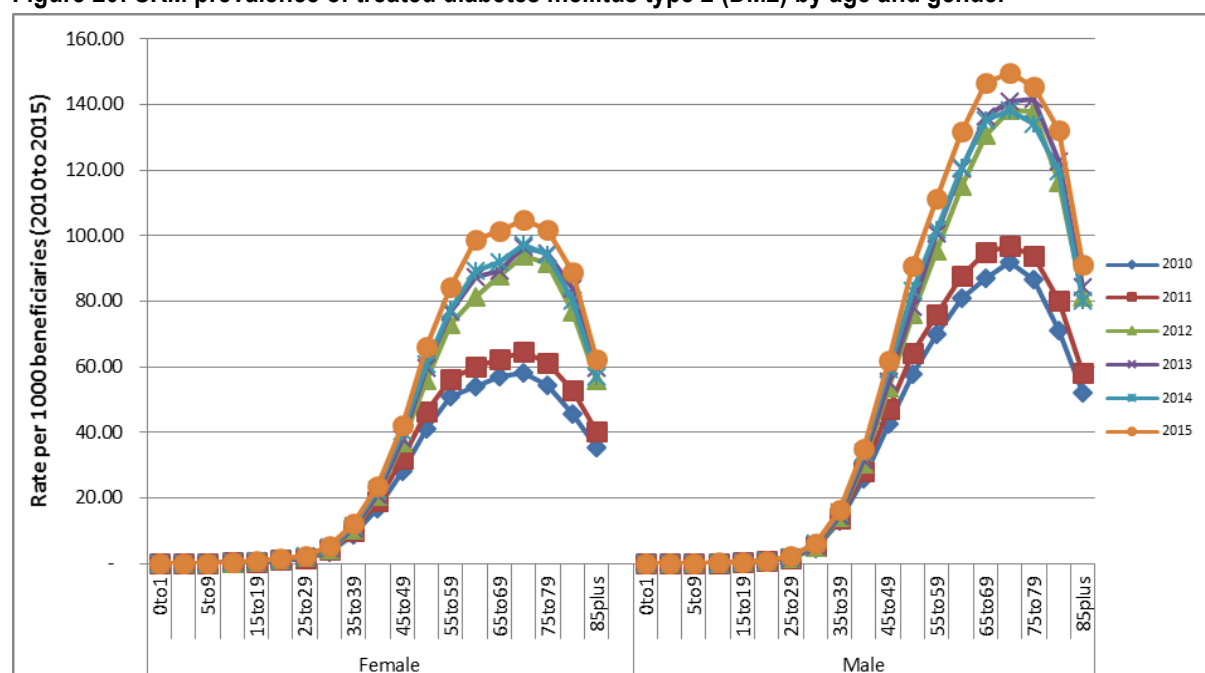
The prevalence of treated DM1 has not changed significantly between 2010 and 2015. Male beneficiaries above the age of 40 have a higher DM1 prevalence rate (Figure 19).

**Figure 19: SRM prevalence of treated diabetes mellitus type 1 (DM1) by age and gender**



Few cases of DM2 were observed in younger beneficiaries (< 30) as shown in Figure 20. DM2 prevalence increased by about 53.8% between 2010 and 2015. DM2 was highly prevalent in male beneficiaries above 40 years old (Figure 20).

**Figure 20: SRM prevalence of treated diabetes mellitus type 2 (DM2) by age and gender**

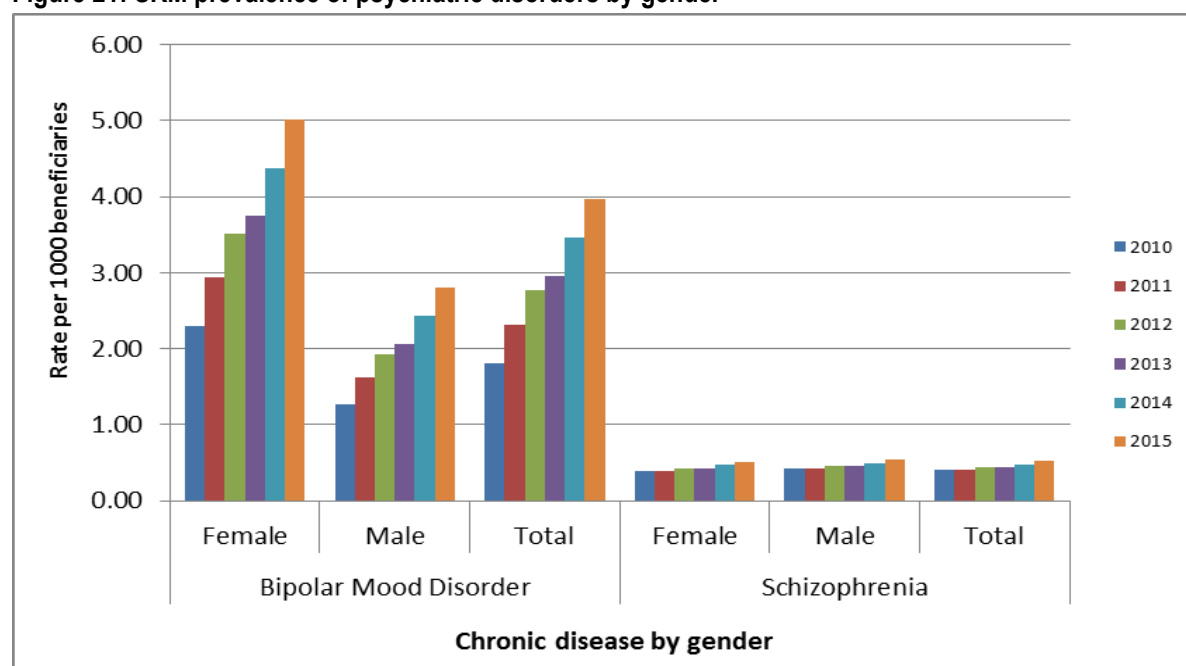


#### 4.3.6 Psychiatric conditions

As displayed in Figure 21, the overall prevalence of treated bipolar mood disorder (BMD) increased between 2010 and 2015 (from 1.91 to 3.97 per 1 000 beneficiaries). Females continued to have higher BMD prevalence rates as opposed to males. BMD was diagnosed and treated in 5.01 and 2.80 per 1 000 in female and male beneficiaries respectively in 2015.

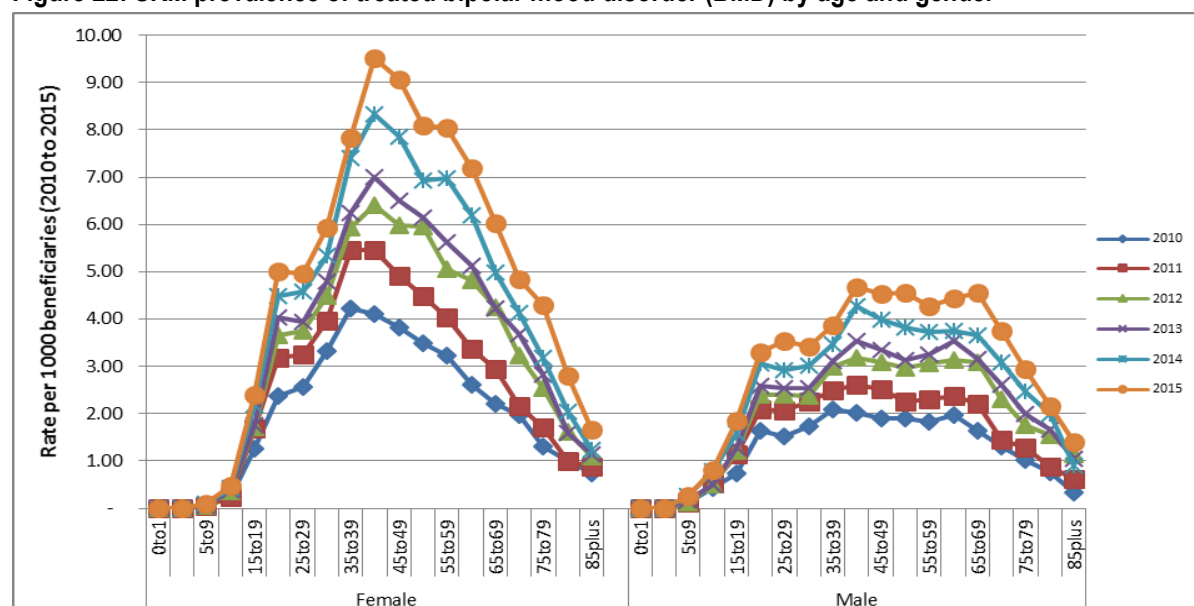
The prevalence of schizophrenia (SCZ) has remained under 1 per 1 000 between 2010 and 2015. Similar rates were observed in both males and females (Figure 21).

**Figure 21: SRM prevalence of psychiatric disorders by gender**

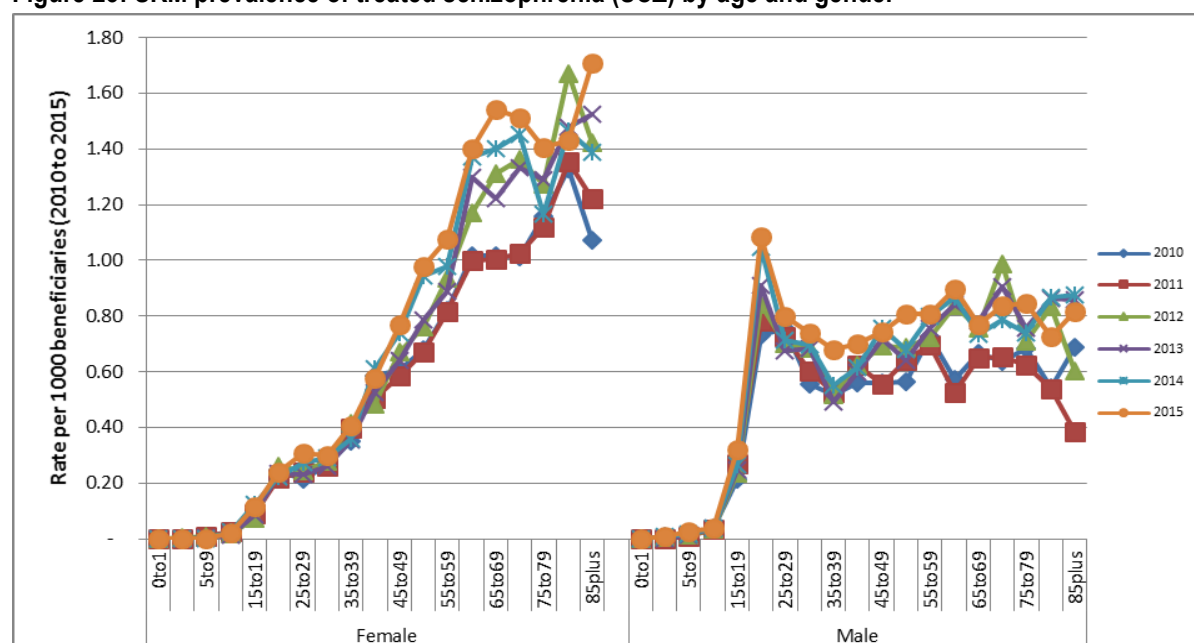


Few beneficiaries under the age of 14 years were treated for BMD (Figure 22). BMD prevalence was higher in female beneficiaries aged between 35 and 60 years (the prevalence rate was above 5 per 1 000). BMD prevalence in male beneficiaries was lower than the corresponding rate in female beneficiaries.

**Figure 22: SRM prevalence of treated bipolar mood disorder (BMD) by age and gender**



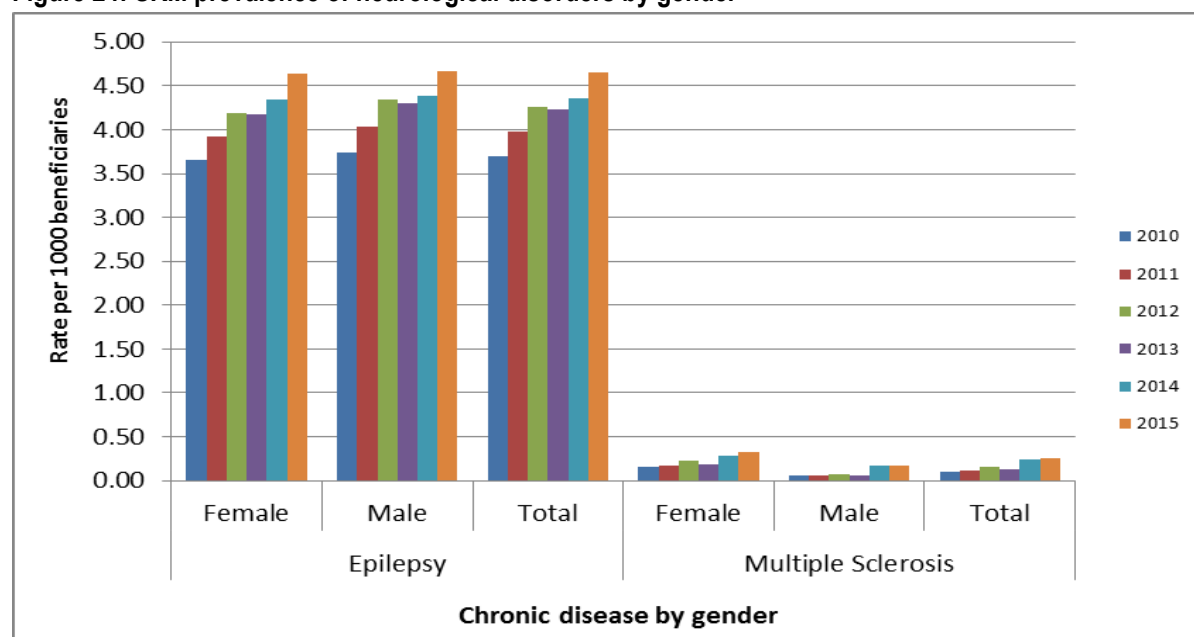
**Figure 23: SRM prevalence of treated schizophrenia (SCZ) by age and gender**



#### 4.3.7 Neurological disorders

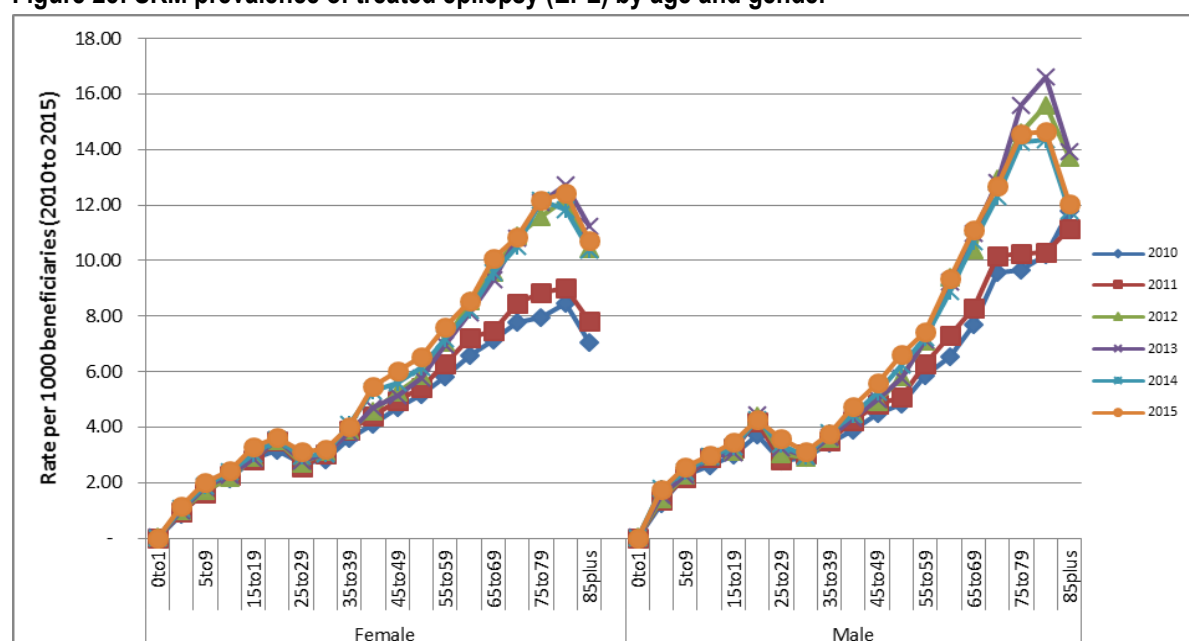
The overall prevalence of treated epilepsy (EPL) increased from 3.86 per 1 000 in 2010, to 4.66 per 1000 beneficiaries in 2015 (Figure 24). Very few beneficiaries, below 0.3 per 1 000, were treated for multiple sclerosis (MSS) during the period between 2010 and 2015.

**Figure 24: SRM prevalence of neurological disorders by gender**



The prevalence of treated epilepsy continued to be strongly correlated with age. A strong correlation may be seen for all age groups between 0 to 75 years (Figure 25).

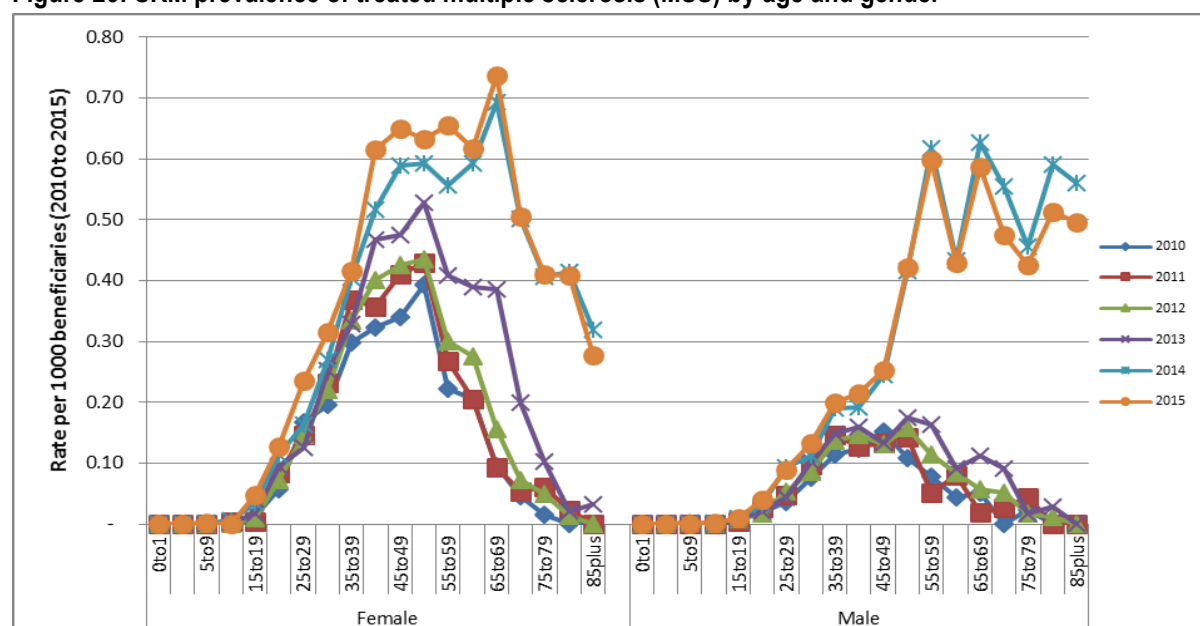
**Figure 25: SRM prevalence of treated epilepsy (EPL) by age and gender**



MSS was rarely seen in both the very young and older age groups, and mostly affected women between 40 and 55 years, as shown in Figure 26. MSS is a rare condition and resulted in volatile (not smoothed) graphs throughout the period under review.



**Figure 26: SRM prevalence of treated multiple sclerosis (MSS) by age and gender**

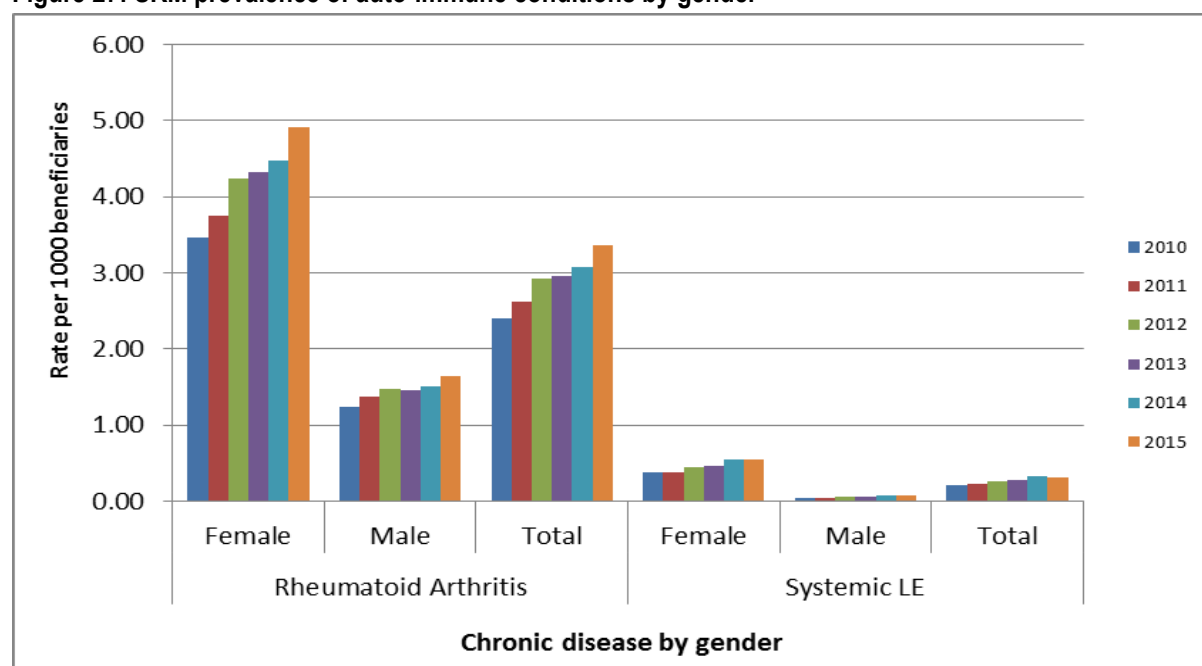


#### 4.3.8 Auto-immune Conditions

The overall prevalence of treated rheumatoid arthritis (RHA) increased from 2.41 per 1 000 in 2010, to 3.47 per 1 000 in 2015. More female than male beneficiaries were treated for rheumatoid arthritis. RHA prevalence in female beneficiaries increased from 3.46 to 4.91 per 1 000 compared to a change of 1.24 to 1.63 per 1 000 in males between 2010 and 2015 respectively (Figure 27).

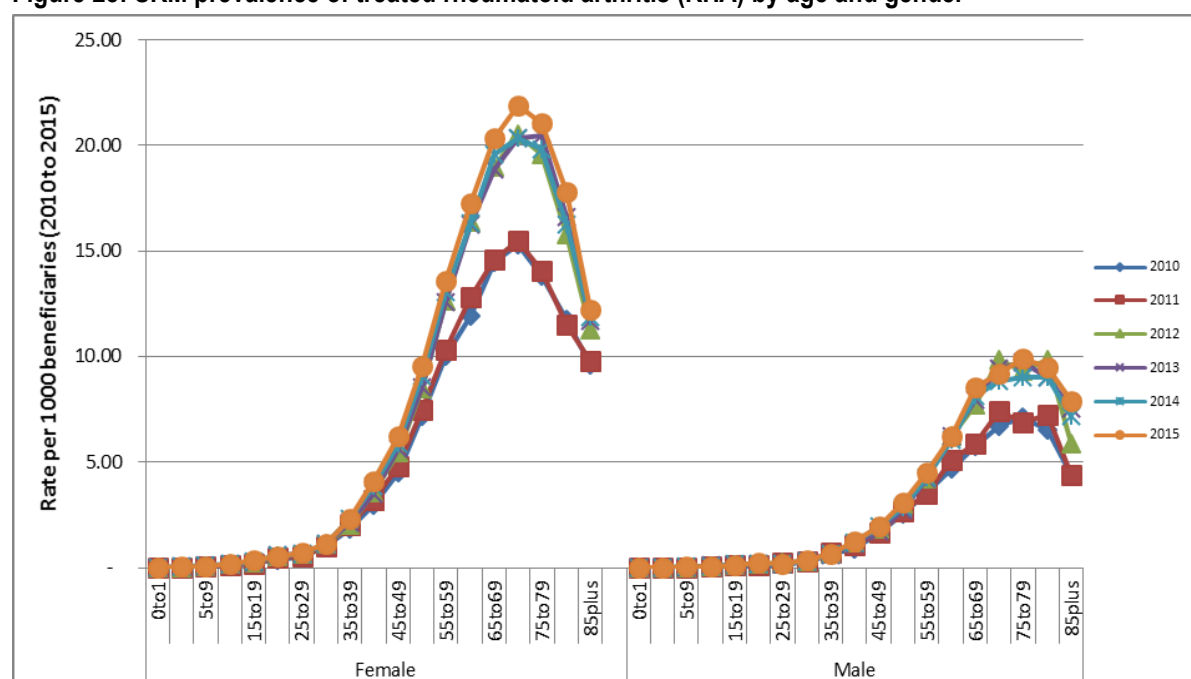
The overall prevalence of treated systemic lupus erythematosus (SLE) increased from 0.21 to 0.32 per 1 000 for all the age groups between 2010 and 2015. In 2015, seven times more women than men were diagnosed and treated for SLE.

**Figure 27: SRM prevalence of auto-immune conditions by gender**



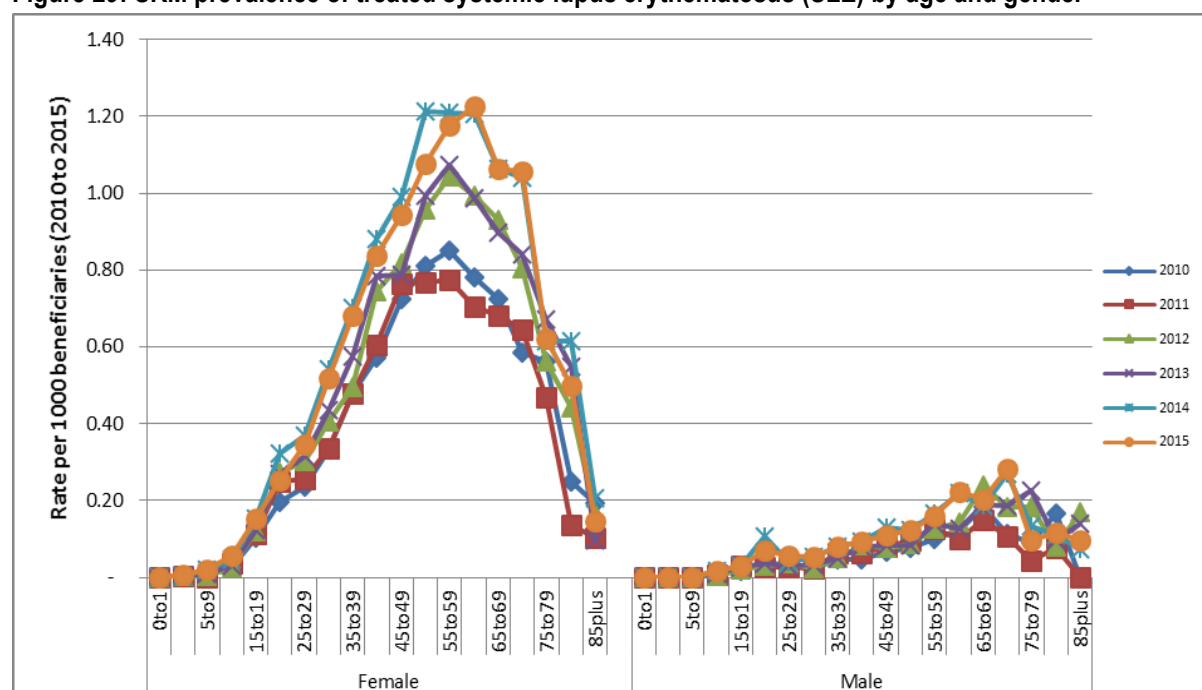
The prevalence of RHA was higher for females older than 40 years. A similar trend was seen in male beneficiaries whose RHA prevalence was also higher in beneficiaries older than 40 years (Figure 28).

**Figure 28: SRM prevalence of treated rheumatoid arthritis (RHA) by age and gender**



As shown in Figure 29, SLE prevalence was higher for females in the age groups between 50 and 74 years.

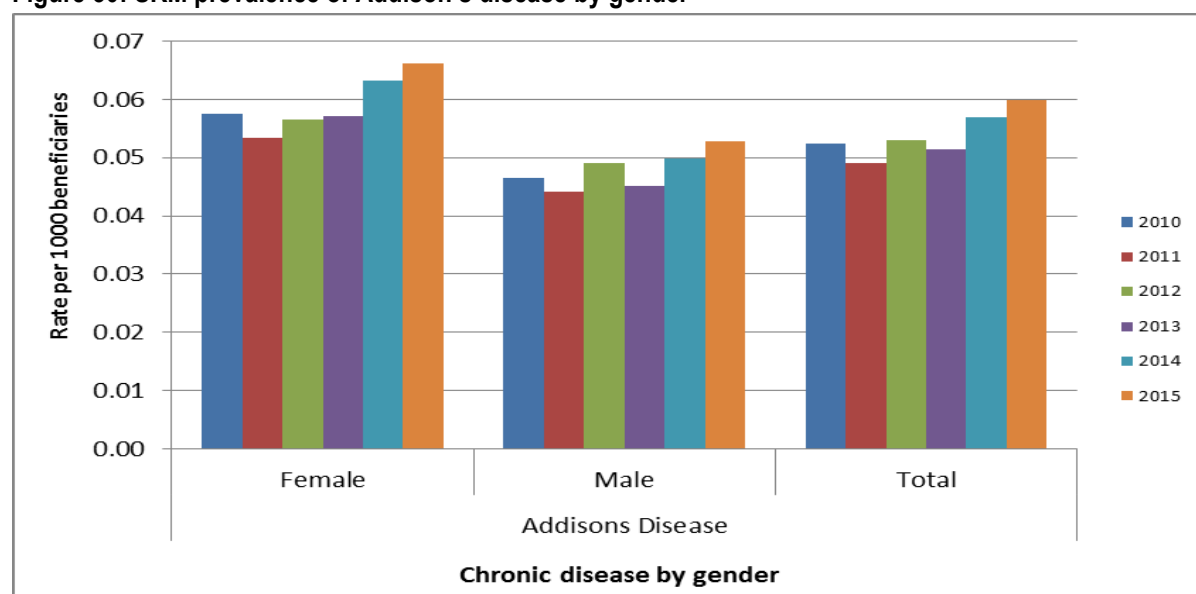
**Figure 29: SRM prevalence of treated systemic lupus erythematosus (SLE) by age and gender**



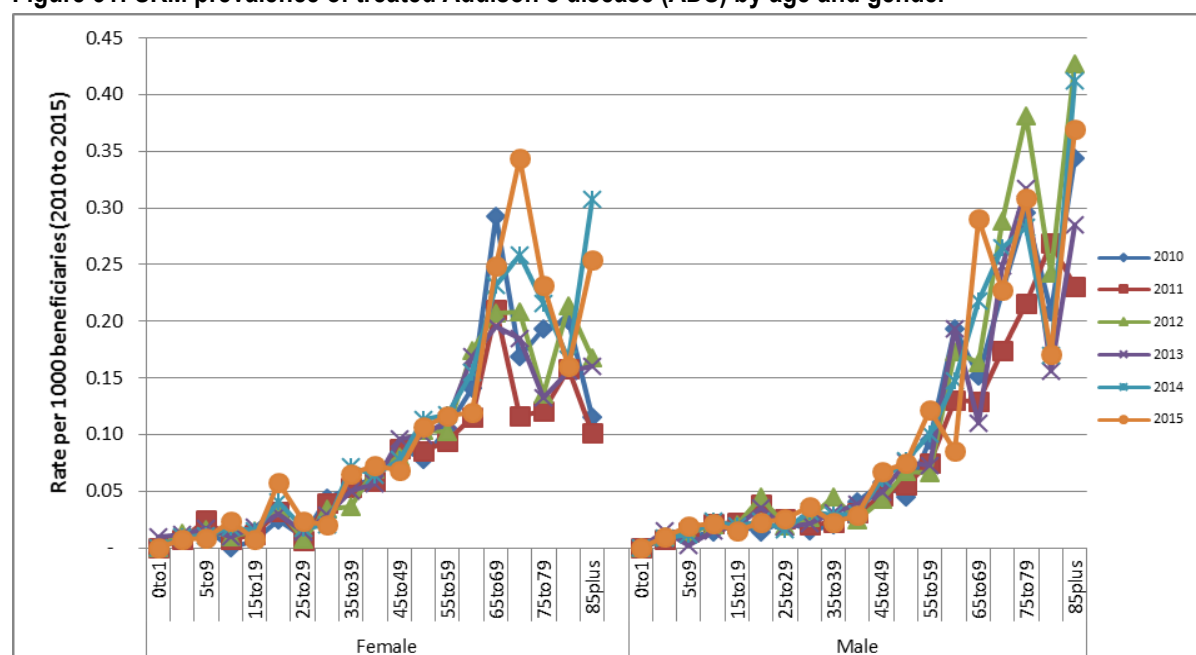
#### 4.3.9 Addison's disease

The overall prevalence of Addison's disease (ADS) in medical scheme beneficiaries was below 0.07 per 1 000 between 2010 and 2015. ADS was atypically more common in the 40 years and older age groups in both male and female beneficiaries (refer to Figures 30 & 31). ADS is a rare condition and resulted in volatile (not smoothed) graphs throughout the period under review.

**Figure 30: SRM prevalence of Addison's disease by gender**



**Figure 31: SRM prevalence of treated Addison's disease (ADS) by age and gender**



#### 4.3.10 Diabetes Insipidus

The overall prevalence of diabetes insipidus (DBI) in the medical scheme beneficiaries was 0.04 per 1 000 in 2015 (Figure 32). There was no significant age or gender-related differences, see Figure 33, in the prevalence of DBI. DBI is a rare condition and resulted in volatile (not smoothed) graphs throughout the period under review.

Figure 32: SRM prevalence of diabetes Insipidus by gender

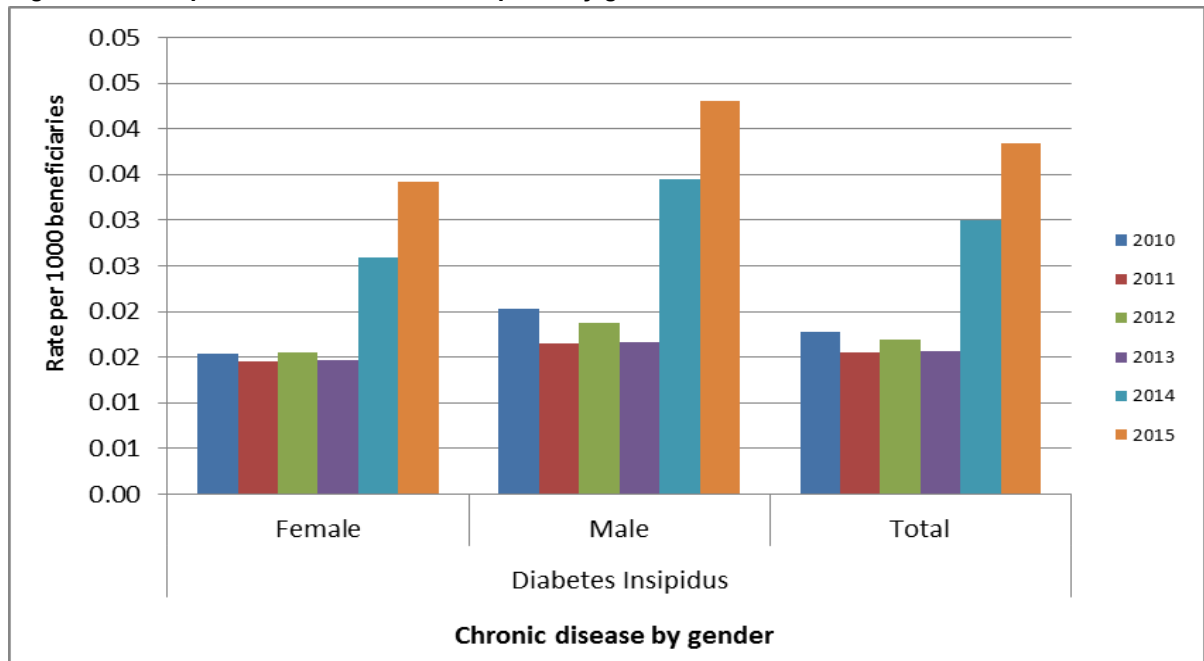
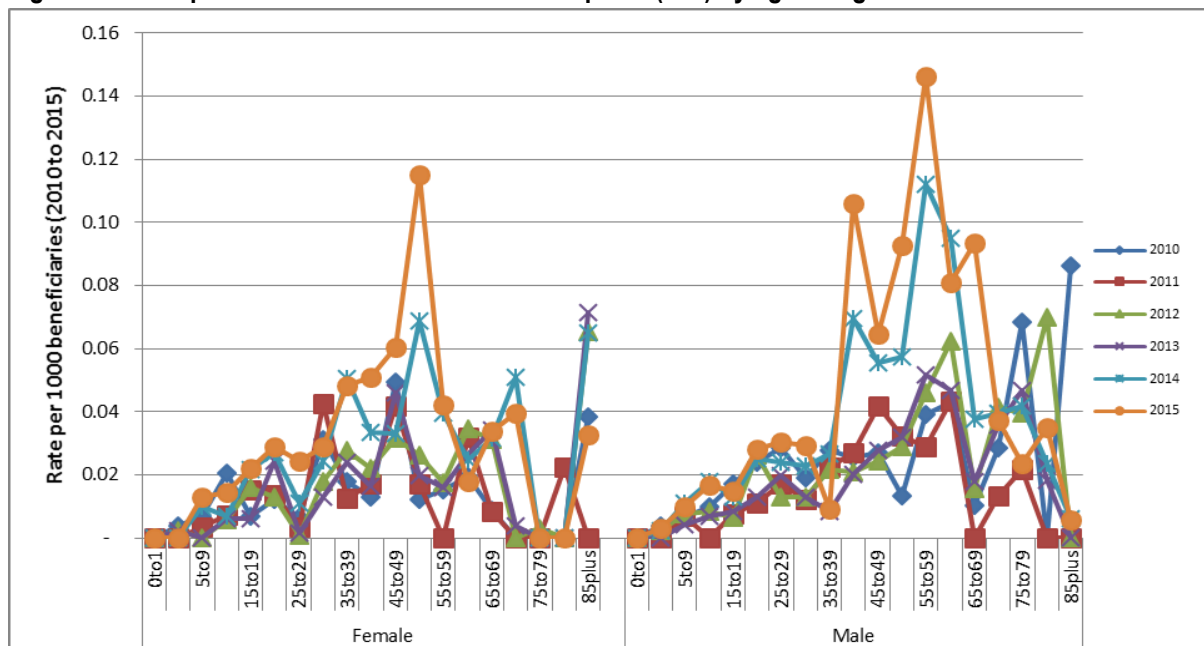


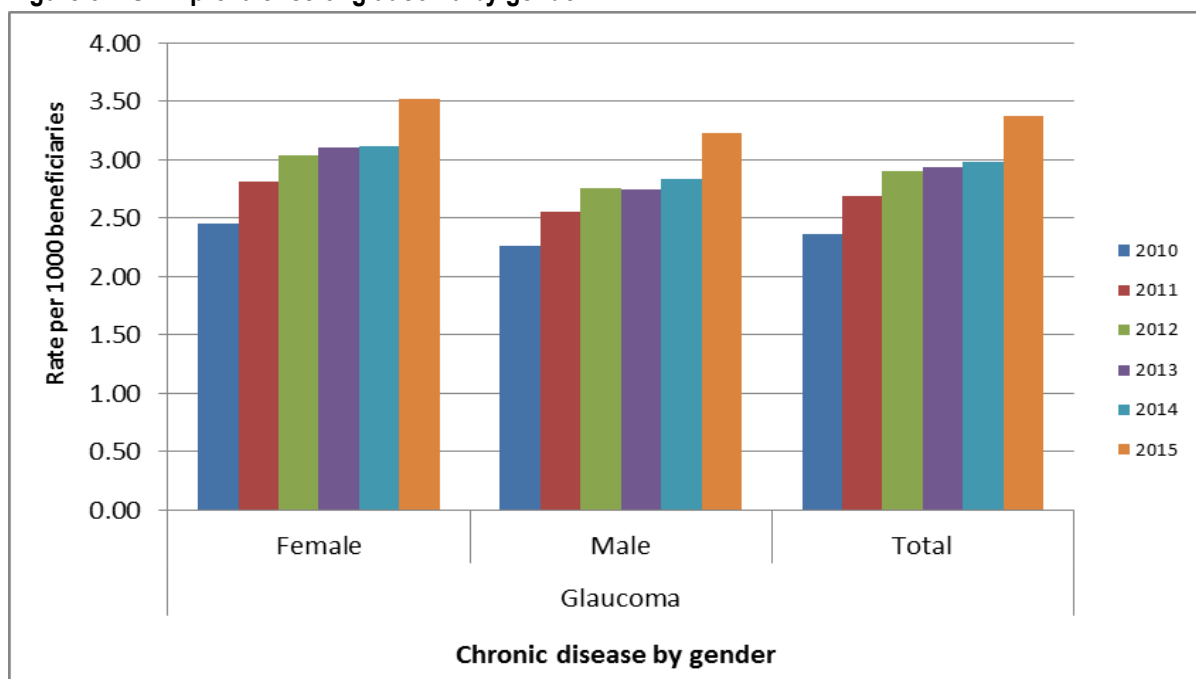
Figure 33: SRM prevalence of treated diabetes insipidus (DBI) by age and gender



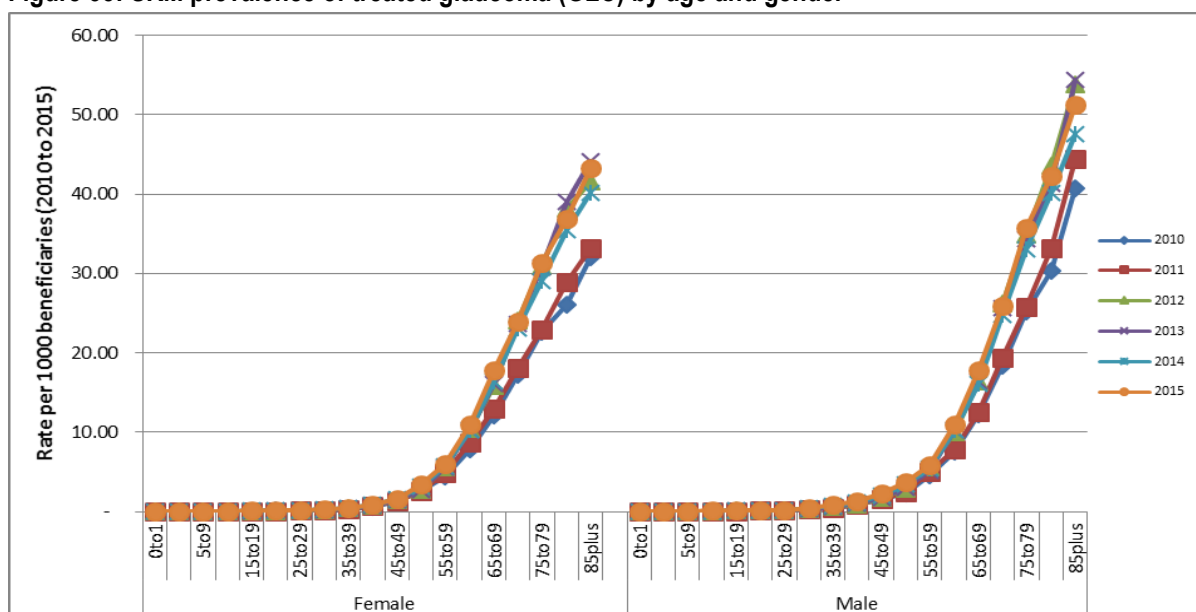
### 4.3.11 Glaucoma

The overall prevalence of glaucoma (GLC) increased from 2.36 per 1 000 in 2010, to 3.38 per 1 000 in 2015. There was no significant gender related difference (Figure 34). GLC in medical schemes beneficiaries was more common in the 40 years and older age group, as can be seen in Figure 35

**Figure 34: SRM prevalence of glaucoma by gender**



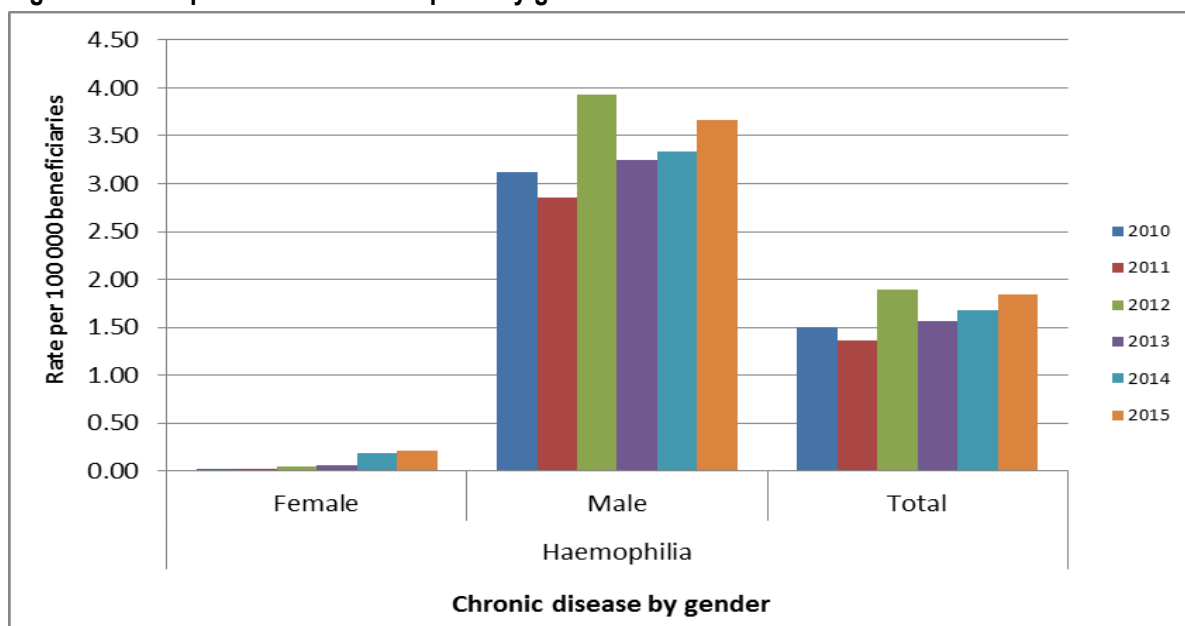
**Figure 35: SRM prevalence of treated glaucoma (GLC) by age and gender**



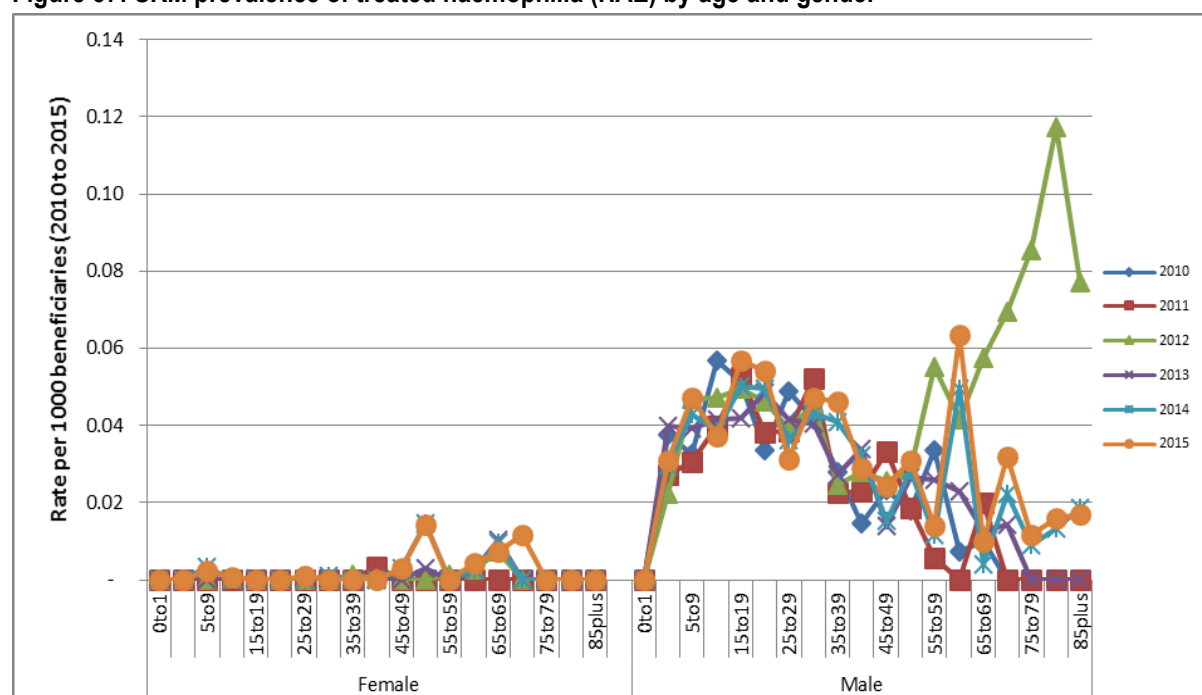
### 4.3.12 Haemophilia

The overall prevalence for haemophilia (HAE) increased from 1.49 per 100 000 in 2010 to 1.84 per 100 000 in 2015. The overall prevalence in male beneficiaries was 3.66 per 100 000 in 2015 (Figures 36 & 37). HAE is a very rare disease and as a result, the age and gender graphs as depicted in Figure 37 will be volatile and sensitive to outliers.

**Figure 36: SRM prevalence of haemophilia by gender**



**Figure 37: SRM prevalence of treated haemophilia (HAE) by age and gender**

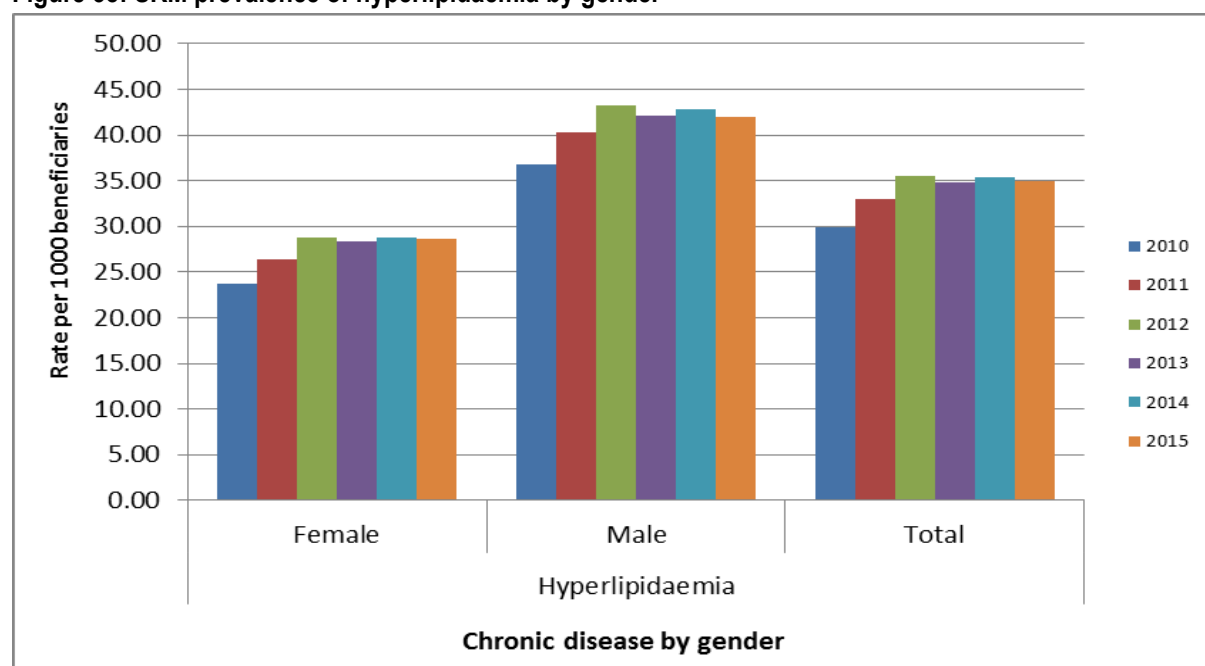


#### 4.3.13 Hyperlipidaemia

A steady increase (about 12.0%) in the overall prevalence of treated hyperlipidaemia (HYL) was noted between 2010 and 2015. HYL prevalence increased from 31.17 per 1 000 in 2010 to 34.90 per 1 000 in 2015. More male than female beneficiaries continued to be diagnosed and treated for the HYL. In male beneficiaries, prevalence increased from 36.77 to 41.94 per 1 000 between 2010 and 2015; an increase from 23.72 to 28.60 per 1 000 was seen in female beneficiaries during the same period. The overall prevalence of HYL decreased by -1.4% between 2014 and 2015, with the decreases occurring in both males and females (Figure 38).

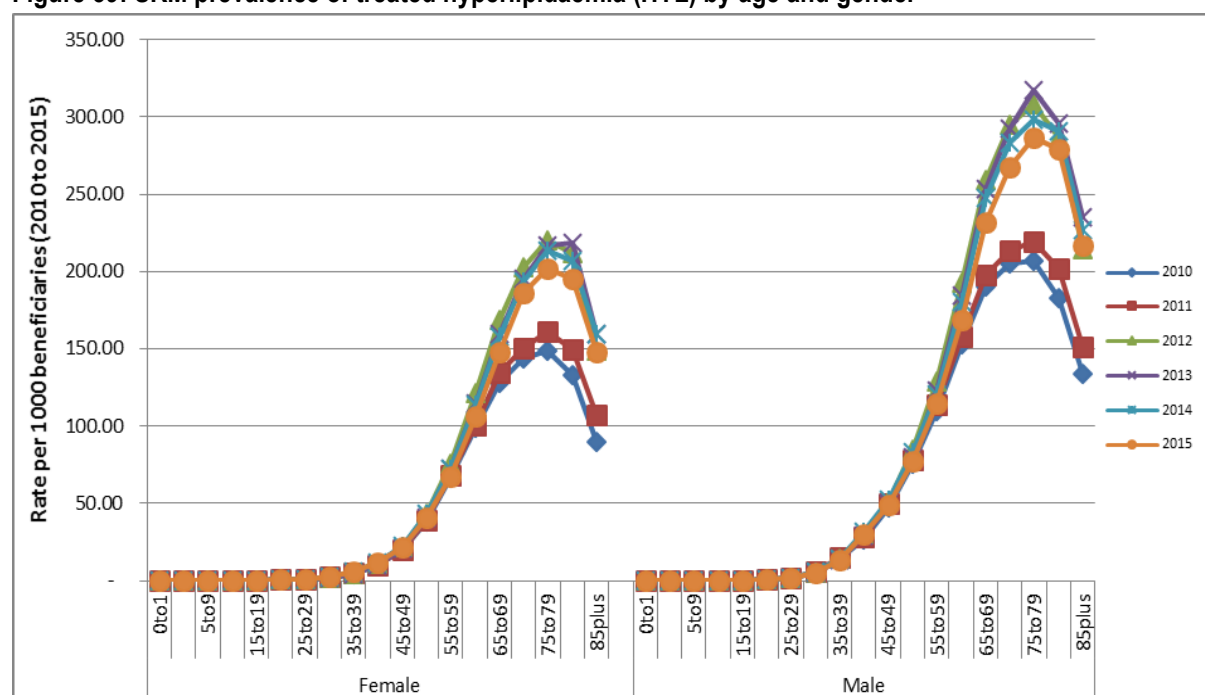


**Figure 38: SRM prevalence of hyperlipidaemia by gender**



HYL prevalence for male and female beneficiaries is higher in the age groups above 50 years. Male beneficiaries above 65 years continued to have the highest HYL prevalence rate (Figure 39).

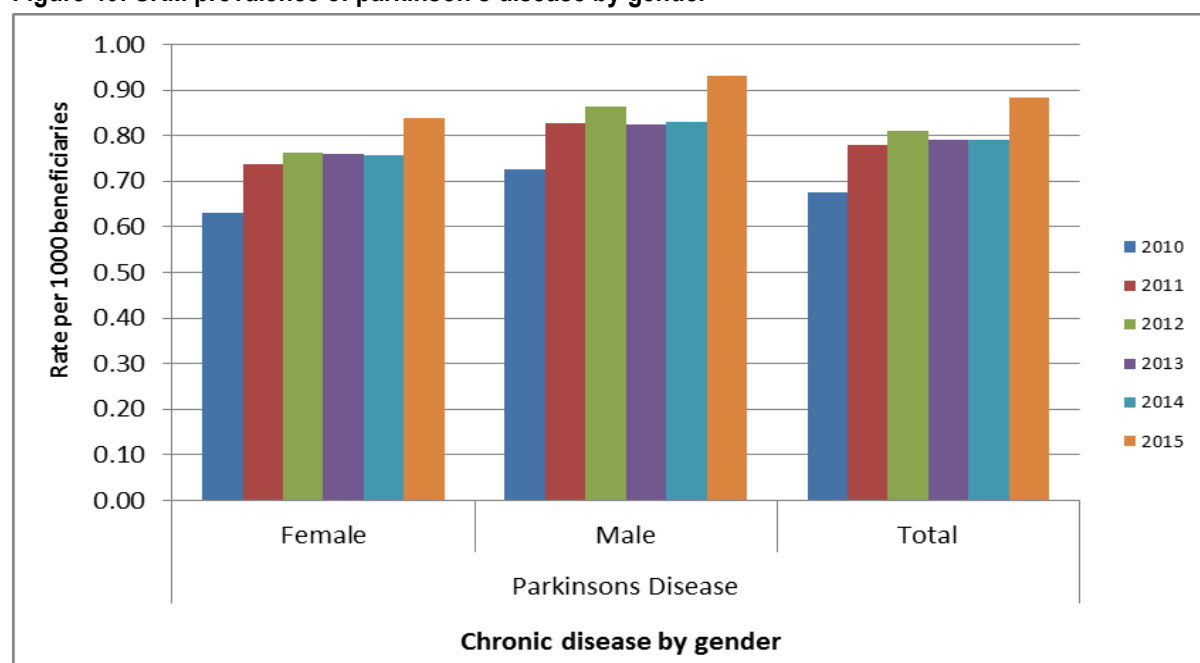
**Figure 39: SRM prevalence of treated hyperlipidaemia (HYL) by age and gender**



#### 4.3.14 Parkinson's disease

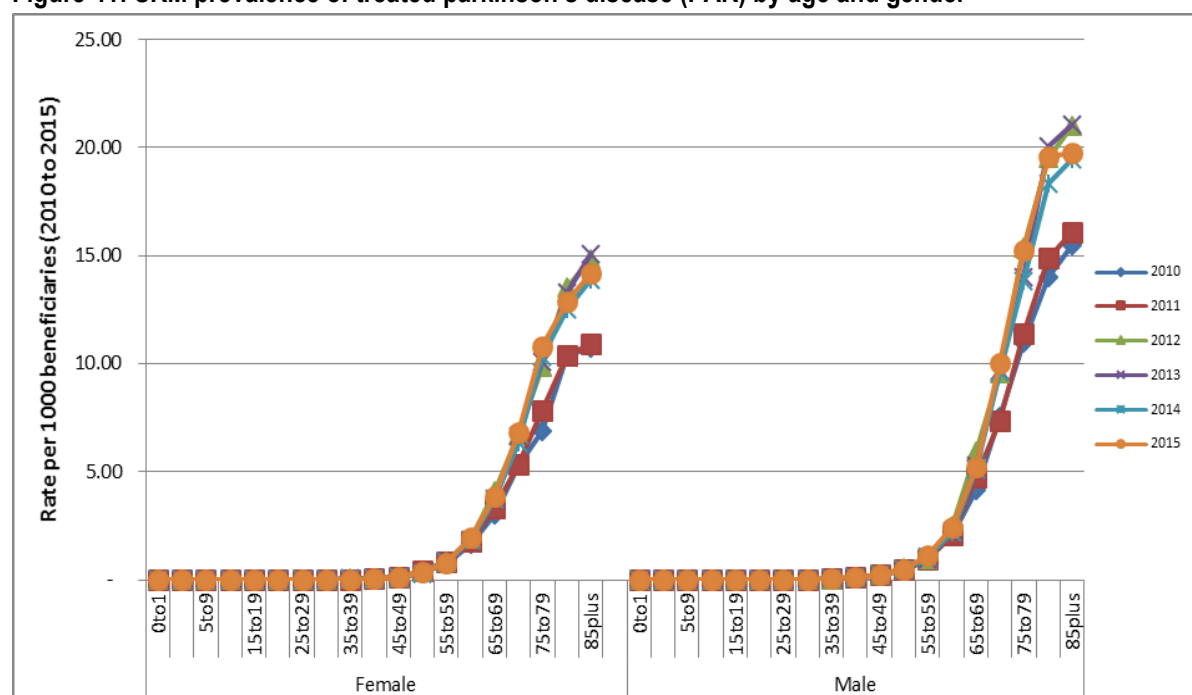
The overall prevalence of parkinson's disease (PAR) increased from 0.67 to 0.92 per 1 000 between 2010 and 2015 (Figure 40).

**Figure 40: SRM prevalence of parkinson's disease by gender**



PAR prevalence was higher among beneficiaries older than 65 years in both males and females. PAR prevalence for beneficiaries younger than 50 years continued at levels below 5 per 1 000 beneficiaries (Figure 41).

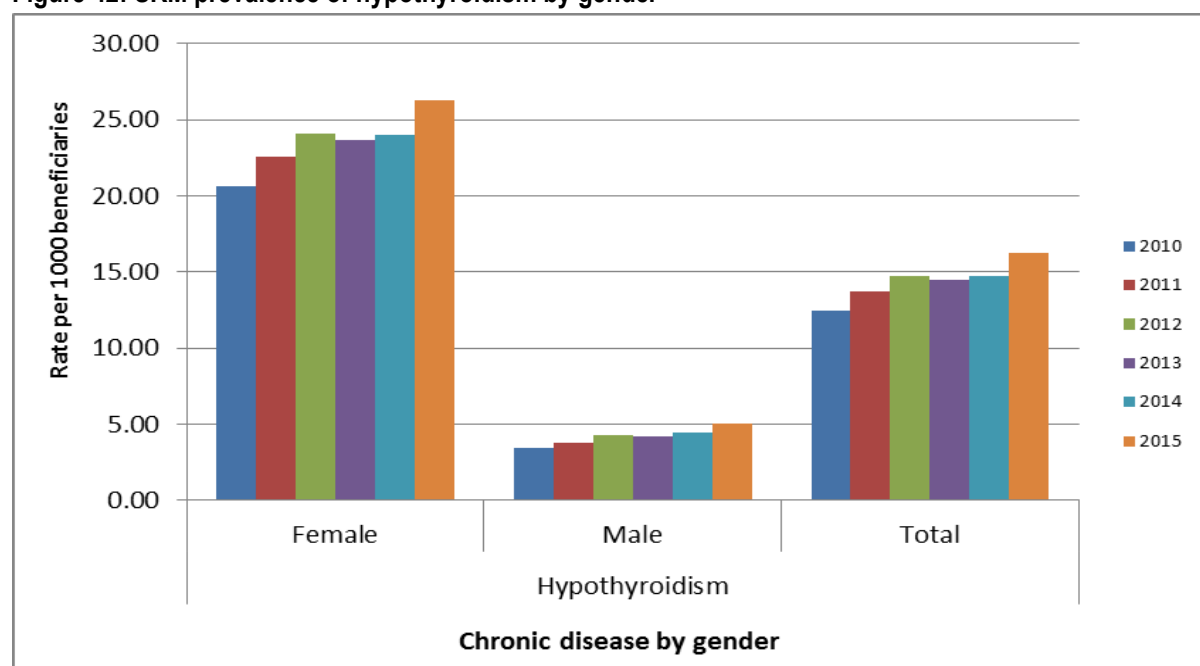
**Figure 41: SRM prevalence of treated parkinson's disease (PAR) by age and gender**



#### 4.3.15 Hypothyroidism

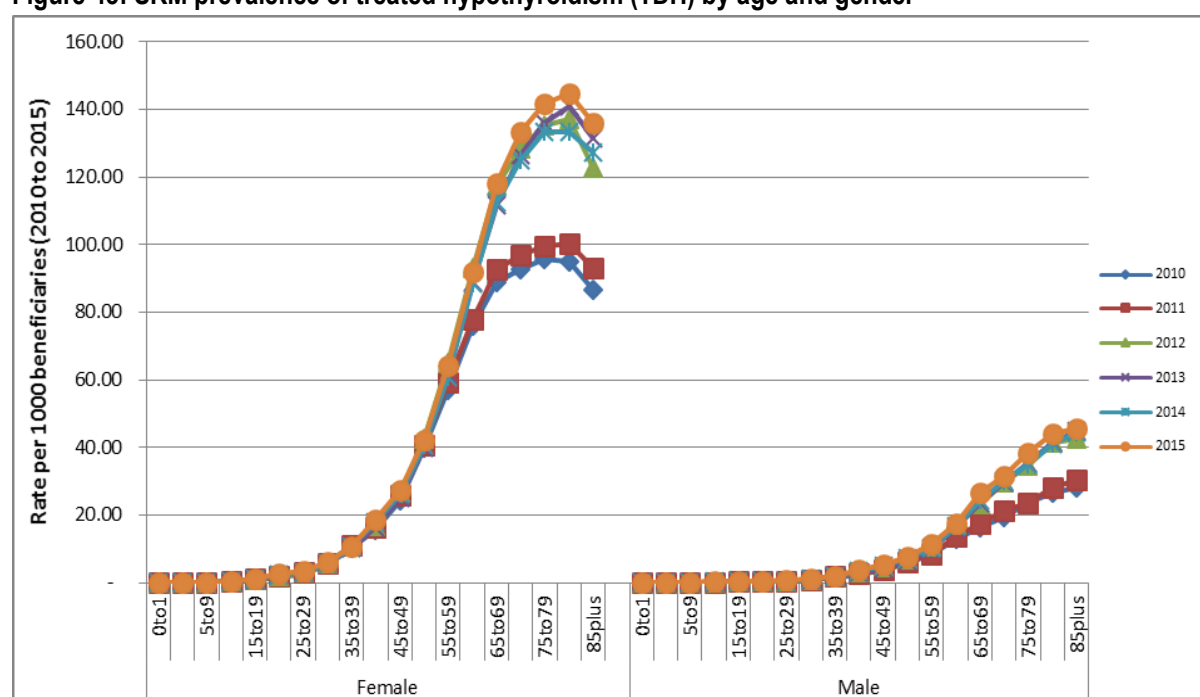
Over five times more female than male beneficiaries were diagnosed and treated for hypothyroidism (TDH) between 2010 and 2015. The overall treated TDH prevalence increased from 12.99 to 16.23 per 1 000 beneficiaries between 2010 and 2016. TDH prevalence increased in female beneficiaries, from 20.66 per 1 000 in 2010, to 26.29 per 1 000 in 2015. TDH prevalence increased in male beneficiaries, from 3.39 per 1 000 in 2010, to 4.99 per 1 000 in 2015 (Figure 42).

**Figure 42: SRM prevalence of hypothyroidism by gender**



TDH was mostly prevalent in female beneficiaries older than 40 years. Male TDH prevalence was lower than that of females. TDH prevalence in males was higher in beneficiaries older than 50 years (Figure 43).

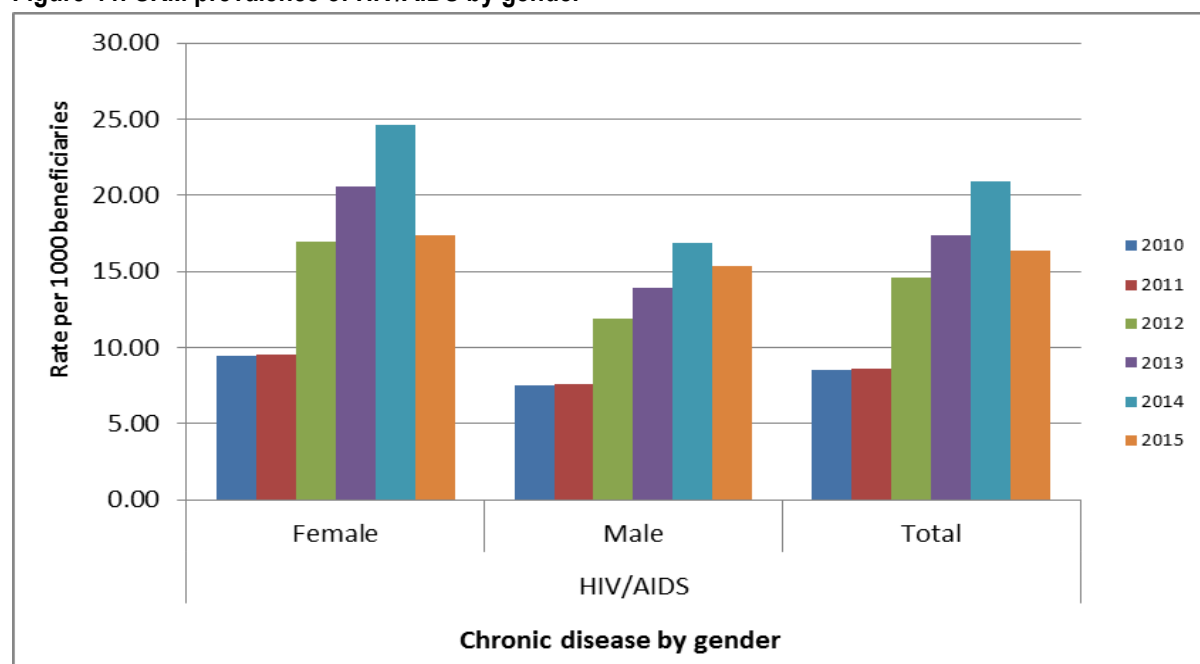
**Figure 43: SRM prevalence of treated hypothyroidism (TDH) by age and gender**



#### 4.3.16 HIV/AIDS

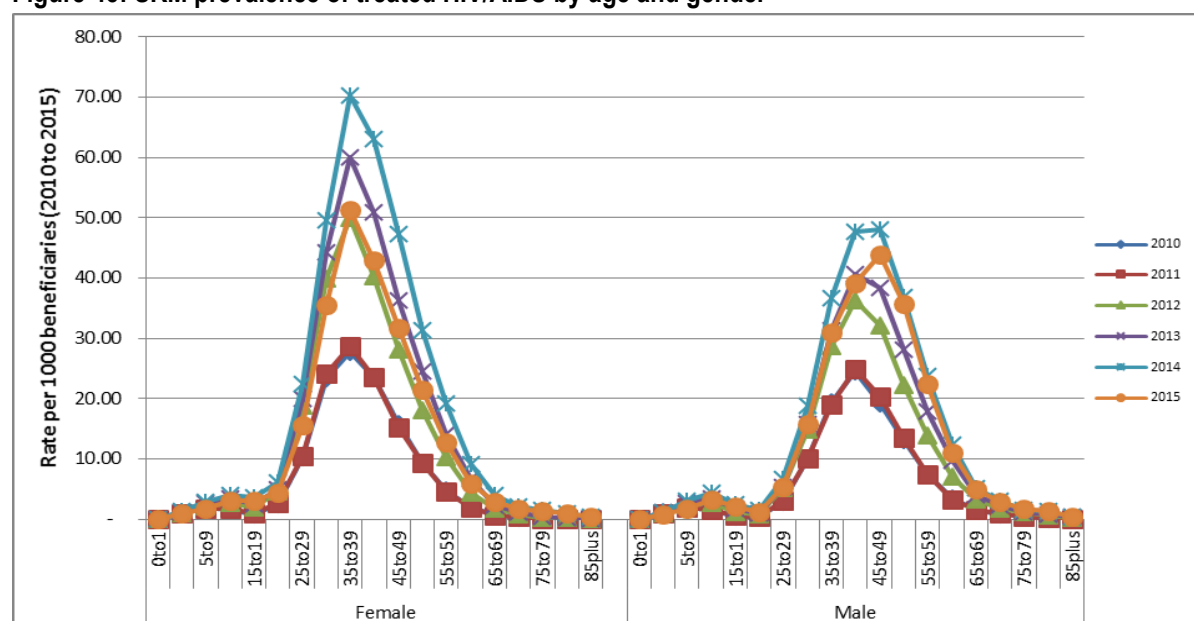
The prevalence of treated HIV/AIDS in medical schemes' beneficiaries increased over the period between 2010 and 2015 (from 8.99 per 1 000 to 16.39 per 1 000 beneficiaries). As depicted in figure 44, in 2015, HIV/AIDS prevalence was higher in female beneficiaries (17.45 per 1 000) compared to male beneficiaries (15.34 per 1 000). (The decline in treated HIV/AIDS prevalence is to be interpreted with caution as the CMS is in a process of investigating whether the decline is a result of data quality issues or not).

**Figure 44: SRM prevalence of HIV/AIDS by gender**



Female beneficiaries had higher HIV/AIDS prevalence rates compared to male beneficiaries. HIV/AIDS prevalence in female beneficiaries was high in the age bands between 25 and 54 years. Female beneficiaries in the age band 35 to 39 years had the highest HIV/AIDS prevalence rate in the medical schemes industry. A similar trend was observed in male beneficiaries. Male beneficiaries in the age band 45 to 49 years had the highest HIV/AIDS prevalence rate in the male category (Figure 45).

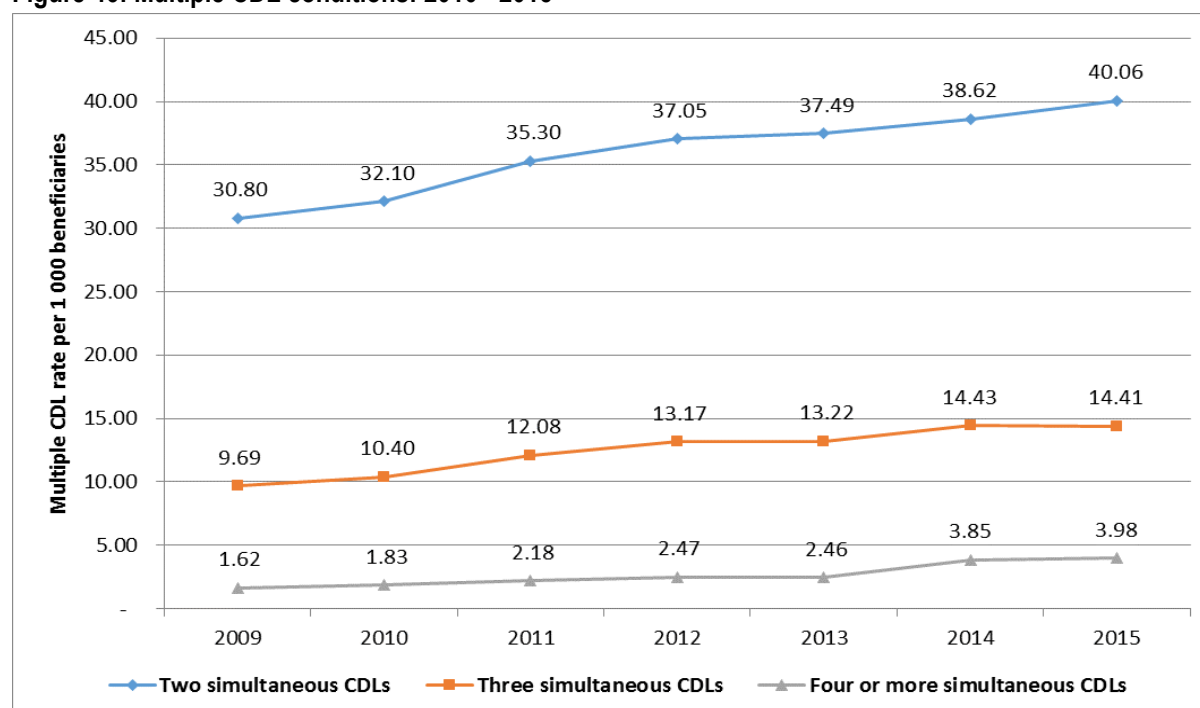
**Figure 45: SRM prevalence of treated HIV/AIDS by age and gender**



#### 4.4 Multiple CDL conditions: 2010 - 2015

A number of medical scheme beneficiaries were diagnosed and treated for multiple CDL conditions. Beneficiaries diagnosed with two CDL conditions increased by 24.8% from 35.30 in 2010 to 40.06 per 1 000 beneficiaries in 2015. The prevalence of three simultaneous CDL conditions in beneficiaries on medical schemes increased by 38.6% from 10.40 to 14.41 per 1 000 beneficiaries between 2010 and 2015. A number of beneficiaries with four or more CDL conditions increased by 117.5% from 1.83 in 2010 to 3.98 per 1 000 beneficiaries in 2015. Figure 46 depicts trends in the prevalence of multiple conditions for the period between 2010 and 2015.

**Figure 46: Multiple CDL conditions: 2010 - 2015**



#### **4.5 Comparisons between SRM prevalence and general prevalence (a relaxed definition)<sup>4</sup>**

For the first time in 2015, the CMS also analysed data on a more relaxed definition of prevalence as opposed to the SRM definition of prevalence. The results of the analysis on a more relaxed definition of prevalence are contained in Annexure A of this report. This section gives a high level comparison between the SRM prevalence rates and general prevalence rates (calculated using a more relaxed definition of prevalence).

Table 6 show the comparison between the SRM prevalence rates and general prevalence rate. The results are further depicted in Figure 47. As expected, the general prevalence rates are higher than the SRM prevalence rates.

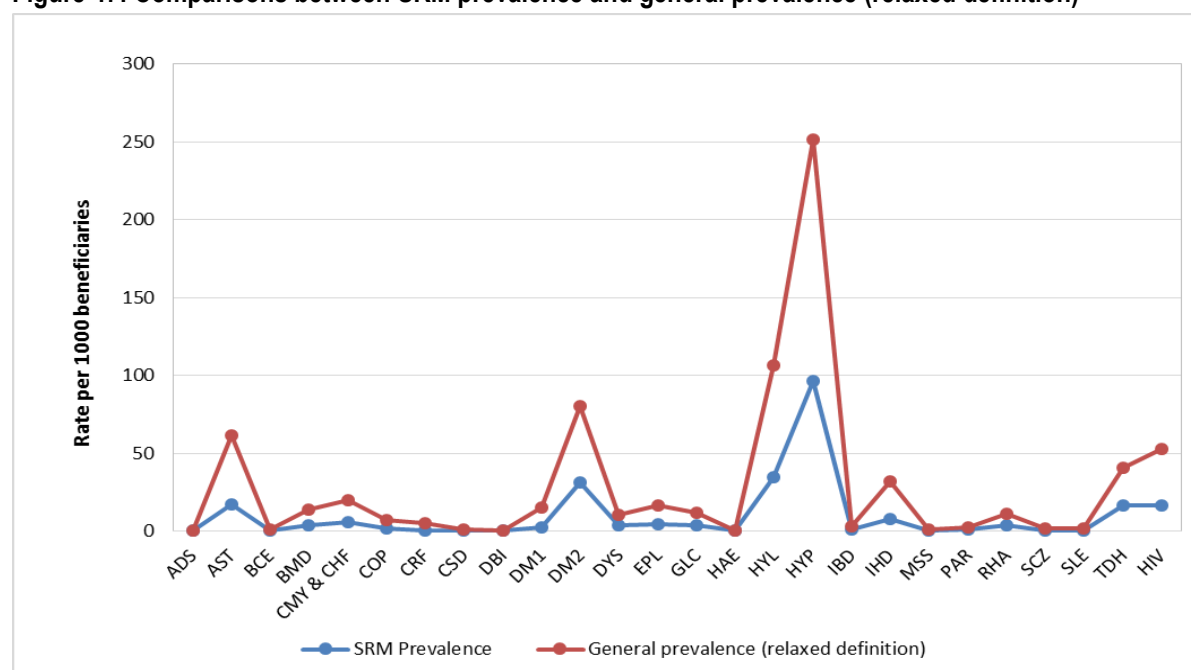
<sup>4</sup> Refer to Annexure A of this report for more detailed definition and results of general prevalence

**Table 6: Comparisons between SRM prevalence and general prevalence (relaxed definition)**

Chronic Disease Code	SRM prevalence			General prevalence (relaxed definition)			Difference between SRM and General prevalence	
	2014	2015	% change	2014	2015	% change	2014	2015
ADS	0.06	0.06	5.2%	0.12	0.15	24.1%	0.06	0.09
AST	16.09	17.13	6.5%	42.76	44.60	4.3%	26.67	27.47
BCE	0.07	0.08	13.6%	1.27	1.11	-12.1%	1.19	1.03
BMD	3.45	3.97	15.0%	9.15	9.85	7.6%	5.70	5.88
CMY & CHF	5.45	5.77	5.8%	13.80	14.14	2.5%	8.35	8.38
COP	1.28	1.43	12.0%	5.88	5.89	0.2%	4.61	4.46
CRF	0.52	0.49	-5.3%	4.22	4.61	9.2%	3.71	4.12
CSD	0.20	0.21	2.5%	0.66	0.70	5.7%	0.46	0.49
DBI	0.03	0.04	28.1%	0.39	0.41	4.1%	0.36	0.37
DM1	2.03	2.10	3.7%	12.48	12.78	2.4%	10.46	10.68
DM2	27.91	31.21	11.8%	45.58	49.15	7.8%	17.67	17.93
DYS	3.24	3.71	14.5%	6.61	6.92	4.7%	3.38	3.22
EPL	4.36	4.65	6.5%	10.95	11.62	6.1%	6.59	6.98
GLC	2.98	3.38	13.3%	7.61	8.26	8.5%	4.63	4.87
HAE	0.02	0.02	10.1%	0.05	0.05	-1.8%	0.04	0.03
HYL	35.41	34.90	-1.4%	66.84	71.59	7.1%	31.43	36.69
HYP	89.07	96.05	7.8%	149.08	155.74	4.5%	60.02	59.69
IBD	1.28	1.23	-4.2%	1.86	1.93	3.7%	0.58	0.70
IHD	7.28	7.94	9.1%	22.78	23.63	3.7%	15.50	15.69
MSS	0.23	0.26	9.9%	0.52	0.49	-6.1%	0.29	0.23
PAR	0.79	0.88	11.7%	1.38	1.47	6.6%	0.59	0.59
RHA	3.07	3.37	9.6%	7.41	7.83	5.6%	4.34	4.46
SCZ	0.48	0.52	9.2%	1.07	1.13	5.9%	0.59	0.61
SLE	0.33	0.32	-2.3%	0.99	1.08	8.9%	0.66	0.76
TDH	14.76	16.24	10.0%	22.58	24.15	7.0%	7.82	7.92
HIV	20.96	16.40	-21.8%	33.26	36.01	8.2%	12.30	19.61



**Figure 47: Comparisons between SRM prevalence and general prevalence (relaxed definition)**



## 5 Discussion

The upward trend in diagnosis and treatment of many conditions on the chronic disease list continued in 2015. The top 10 rankings of prevalence of CDL's and HIV/AIDS according to prevalence rates did not change significantly between 2014 and 2015.

The top 10 ranked CDL's and HIV/AIDS (chronic conditions with the highest prevalent rates) are hypertension, hyperlipidaemia, diabetes mellitus 2, asthma, hypothyroidism, HIV/AIDS, coronary artery disease, epilepsy, cardiomyopathy and bipolar mood disorder. The CDL's listed as top 10 ranking CDL's had prevalence rates of at least 3 per 1 000 beneficiaries in 2014.

There has been a decline in prevalence of treated HIV/AIDS between 2014 and 2015. The decline needs to be interpreted with caution as the CMS will be monitoring the data to verify if the decline was a result of data quality issues or not.

The number of medical scheme beneficiaries who were diagnosed and treated for multiple CDL conditions continued with the upward trend in 2015. This might have a negative impact on the risk profiles of medical schemes. The deterioration in risk profiles should be a concern for medical schemes.

Whilst the upward trend in diagnosis and treatment of many chronic conditions on the CDL continued in 2015, this study is not yet in a position to isolate specific reasons for this increase in chronic diseases; the trend could still be generally attributed to improved data management systems of medical schemes and administrators, the deteriorating disease profile, increased beneficiary awareness of entitlements and changes in care-seeking behaviour. The deterioration in risk profiles should be a concern for medical schemes and schemes should ensure that value for money is attained from the managed care programmes.

## **6 Annexure A (CDL conditions & HIV/AIDS prevalence: a more relaxed definition)**

The first part (section 1 to section 5) of the report defined prevalence as diagnosed and treated prevalence as defined by the SRM process (this data was extracted from part A7 of the ASR system). Medical schemes use the rules set out in the “*Guidelines for the Identification of Beneficiaries with Risk Factors in Accordance with the Entry and Verification Criteria v9.1*” (Council for Medical Schemes, 2015) to identify each chronic disease case.

This section of the report (Annexure A) defines prevalence in a more relaxed manner without entirely being guided by the E&V criteria. Prevalence is defined as the count of beneficiaries who have had at-least one claim for specified CDL condition during the year (this data is extracted from table C5 of the ASR system). This data was collected for the first time in 2015 and as a result CMS will monitor the quality of the data as time progresses. A more detailed analysis of this data will be provided in the up-coming studies once enough data is available (to conduct data quality tests using trend). This annexure only provides summary tables of the data at a higher level.

## 6.1 CDL and HIV/AIDS prevalence per scheme type

**Table 7: Average prevalence per 1 000 beneficiaries for the 26 CDL conditions and HIV/AIDS**

Chronic Disease Code	2015 industry rank (2014)	Restricted			Open			Total		
		2014	2015	% change	2014	2015	% change	2014	2015	% change
ADS	25 (25)	0.10	0.14	50.3%	0.14	0.16	9.8%	0.12	0.15	24.1%
AST	4 (4)	48.74	51.90	6.5%	37.97	39.02	2.7%	42.76	44.60	4.3%
BCE	20 (19)	2.03	1.71	-15.9%	0.65	0.66	0.6%	1.27	1.11	-12.1%
BMD	11 (11)	8.29	9.38	13.2%	9.85	10.21	3.7%	9.15	9.85	7.6%
CMY & CHF	8 (8)	16.48	16.94	2.8%	11.65	12.00	3.0%	13.80	14.14	2.5%
COP	15 (15)	6.09	5.98	-1.7%	5.72	5.82	1.9%	5.88	5.89	0.2%
CRF	16 (16)	4.90	5.44	11.0%	3.68	3.97	8.0%	4.22	4.61	9.2%
CSD	22 (22)	0.49	0.55	10.9%	0.79	0.81	2.5%	0.66	0.70	5.7%
DBI	24 (24)	0.50	0.53	7.5%	0.30	0.31	1.2%	0.39	0.41	4.1%
DM1	9 (9)	14.26	14.82	3.9%	11.06	11.21	1.4%	12.48	12.78	2.4%
DM2	3 (3)	54.48	59.31	8.9%	38.47	41.36	7.5%	45.58	49.15	7.8%
DYS	14 (14)	5.80	5.94	2.3%	7.26	7.67	5.7%	6.61	6.92	4.7%
EPL	10 (10)	11.78	12.88	9.4%	10.30	10.66	3.6%	10.95	11.62	6.1%
GLC	12 (12)	7.30	8.20	12.3%	7.86	8.30	5.6%	7.61	8.26	8.5%
HAE	26 (26)	0.04	0.04	0.0%	0.06	0.06	-2.4%	0.05	0.05	-1.8%
HYL	2 (2)	63.41	70.23	10.8%	69.59	72.63	4.4%	66.84	71.59	7.1%
HYP	1 (1)	159.39	170.60	7.0%	140.84	144.34	2.5%	149.08	155.74	4.5%
IBD	17 (17)	1.85	1.92	3.8%	1.88	1.94	3.5%	1.86	1.93	3.7%
IHD	7 (6)	21.18	22.26	5.1%	24.06	24.68	2.6%	22.78	23.63	3.7%
MSS	23 (23)	0.46	0.38	-18.3%	0.57	0.58	1.2%	0.52	0.49	-6.1%
PAR	18 (18)	1.33	1.45	9.7%	1.43	1.49	4.3%	1.38	1.47	6.6%
RHA	13 (13)	8.80	9.36	6.4%	6.30	6.65	5.6%	7.41	7.83	5.6%
SCZ	19 (20)	1.26	1.38	9.2%	0.91	0.94	3.2%	1.07	1.13	5.9%
SLE	21 (21)	0.91	1.03	13.4%	1.06	1.12	5.6%	0.99	1.08	8.9%
TDH	6 (7)	21.37	23.30	9.0%	23.55	24.81	5.3%	22.58	24.15	7.0%
HIV	5 (5)	50.20	55.64	10.8%	19.71	20.96	6.3%	33.26	36.01	8.2%

**\*\* Percentage changes may not add-up due to rounding. \*\* Note: that the table above is not SRM prevalence.**

## 6.2 CDL and HIV/AIDS prevalence by Gender

**Table 8: Average prevalence per 1 000 beneficiaries for the 26 CDL conditions and HIV/AIDS by gender**

Chronic Disease Code	2015 industry rank (2014)	Female			Male			Total		
		2014	2015	% change	2014	2015	% change	2014	2015	% change
ADS	25 (25)	0.14	0.17	16.9%	0.10	0.13	35.5%	0.12	0.15	24.1%
AST	4 (4)	44.83	46.75	4.3%	40.46	42.21	4.3%	42.76	44.60	4.3%
BCE	20 (19)	1.32	1.17	-11.4%	1.20	1.05	-13.0%	1.27	1.11	-12.1%
BMD	11 (11)	11.44	12.26	7.2%	6.60	7.16	8.4%	9.15	9.85	7.6%
CMY & CHF	8 (8)	13.73	14.03	2.2%	13.87	14.28	2.9%	13.80	14.14	2.5%
COP	15 (15)	5.26	5.25	-0.1%	6.57	6.61	0.5%	5.88	5.89	0.2%
CRF	16 (16)	4.22	4.57	8.2%	4.22	4.65	10.2%	4.22	4.61	9.2%
CSD	22 (22)	0.73	0.77	5.1%	0.58	0.62	6.6%	0.66	0.70	5.7%
DBI	24 (24)	0.38	0.41	5.9%	0.39	0.40	2.2%	0.39	0.41	4.1%
DM1	9 (9)	11.56	11.89	2.9%	13.52	13.78	1.9%	12.48	12.78	2.4%
DM2	3 (3)	42.10	45.54	8.2%	49.47	53.18	7.5%	45.58	49.15	7.8%
DYS	14 (14)	6.07	6.28	3.5%	7.21	7.63	5.8%	6.61	6.92	4.7%
EPL	10 (10)	10.96	11.67	6.5%	10.95	11.58	5.7%	10.95	11.62	6.1%
GLC	12 (12)	8.06	8.71	8.0%	7.11	7.75	9.0%	7.61	8.26	8.5%
HAE	26 (26)	0.02	0.02	0.0%	0.09	0.09	0.0%	0.05	0.05	-1.8%
HYL	2 (2)	59.12	63.99	8.2%	75.44	80.10	6.2%	66.84	71.59	7.1%
HYP	1 (1)	155.53	162.27	4.3%	141.91	148.43	4.6%	149.08	155.74	4.5%
IBD	17 (17)	1.98	2.06	4.0%	1.73	1.79	3.2%	1.86	1.93	3.7%
IHD	7 (6)	17.34	17.78	2.5%	28.83	30.16	4.6%	22.78	23.63	3.7%
MSS	23 (23)	0.73	0.69	-5.1%	0.29	0.26	-9.1%	0.52	0.49	-6.1%
PAR	18 (18)	1.33	1.43	7.3%	1.44	1.52	5.8%	1.38	1.47	6.6%
RHA	13 (13)	10.33	10.91	5.6%	4.16	4.38	5.4%	7.41	7.83	5.6%
SCZ	19 (20)	1.04	1.08	3.7%	1.09	1.18	8.3%	1.07	1.13	5.9%
SLE	21 (21)	1.64	1.81	9.8%	0.27	0.27	1.1%	0.99	1.08	8.9%
TDH	6 (7)	36.24	38.52	6.3%	7.38	8.08	9.6%	22.58	24.15	7.0%
HIV	5 (5)	39.82	43.26	8.6%	25.96	27.89	7.4%	33.26	36.01	8.2%

**\*\* Percentage changes may not add-up due to rounding. \*\* Note: that the table above is not SRM prevalence.**

### 6.3 CDL and HIV/AIDS prevalence by Age

**Table 9: Average prevalence per 1 000 beneficiaries for the 26 CDL conditions and HIV/AIDS by age**

Chronic Disease Code 2016	Age Band																	
	1-4 Yrs	5-9 Yrs	10-14 Yrs	15-19 Yrs	20-24 Yrs	25-29 Yrs	30-34 Yrs	35-39 Yrs	40-44 Yrs	45-49 Yrs	50-54 Yrs	55-59 Yrs	60-64 Yrs	65-69 Yrs	70-74 Yrs	75-79 Yrs	80-84 Yrs	85 Yrs+
ADS	0.02	0.05	0.07	0.07	0.12	0.06	0.08	0.14	0.16	0.19	0.25	0.23	0.33	0.49	0.55	0.50	0.45	0.48
AST	65.36	60.76	48.75	35.97	31.07	26.79	29.19	32.88	38.41	42.22	45.43	50.96	59.71	68.57	75.41	81.43	81.01	69.57
BCE	0.58	0.37	0.36	0.51	0.60	0.76	1.02	1.36	1.53	1.59	1.60	1.66	1.77	2.18	2.38	3.47	3.41	3.04
BMD	0.07	0.53	2.05	7.73	13.63	12.83	13.10	14.68	16.63	15.73	14.39	13.26	12.35	11.03	9.68	8.17	7.38	5.68
CHF	0.25	0.15	0.20	0.42	0.64	0.97	1.55	2.47	4.14	6.99	11.00	16.81	25.75	37.78	53.95	77.64	106.70	154.63
CMY	0.13	0.11	0.15	0.31	0.46	0.79	1.20	2.04	3.05	5.09	7.81	11.65	15.76	21.07	28.39	37.10	48.59	57.25
COP	0.77	0.56	0.35	0.37	0.48	0.56	0.80	1.39	2.08	3.68	6.47	11.66	19.58	30.36	43.18	51.30	57.51	54.07
CRF	0.37	0.42	0.56	1.32	2.24	2.81	3.45	3.87	4.71	5.89	7.30	9.11	11.01	13.90	16.47	19.61	23.58	23.34
CSD	0.13	0.10	0.12	0.30	0.58	0.71	0.71	0.84	0.98	0.94	1.02	1.13	1.38	1.57	1.79	1.57	1.39	1.19
DBI	0.02	0.05	0.07	0.07	0.08	0.13	0.17	0.36	0.50	0.79	1.03	1.16	1.21	0.99	0.91	0.77	0.79	0.29
DM1	0.44	1.02	2.09	3.00	4.47	5.03	6.58	9.08	13.06	19.99	28.25	34.94	39.10	39.66	39.52	37.42	30.63	20.82
DM2	0.52	0.68	1.50	2.91	5.20	7.80	14.99	29.31	51.92	83.84	119.72	145.58	166.36	169.40	171.68	168.64	149.46	114.32
DYS	0.11	0.14	0.37	0.83	1.03	1.05	1.36	1.75	2.61	3.83	5.80	9.95	17.97	31.82	50.53	71.05	93.45	106.99
EPL	8.17	7.88	8.38	10.68	11.34	9.58	9.07	10.36	12.28	13.16	14.01	15.25	17.34	19.96	22.47	27.71	29.02	27.57
GLC	0.22	0.33	0.64	0.94	1.27	1.52	2.10	2.88	4.59	7.27	11.01	16.21	25.69	38.14	49.27	62.97	71.98	85.03
HAE	0.05	0.08	0.06	0.06	0.06	0.05	0.04	0.05	0.05	0.03	0.03	0.03	0.07	0.05	0.08	0.05	0.08	0.13
HIV	2.09	4.32	7.04	7.19	12.84	35.74	65.93	90.95	89.00	75.33	54.17	34.50	17.47	7.28	3.60	1.88	1.13	0.40
HYL	0.17	0.30	0.76	1.90	5.39	9.37	16.55	31.43	57.85	91.18	136.16	191.21	260.17	324.08	361.32	375.75	363.75	300.98
HYP	1.16	1.35	2.19	5.55	13.87	29.05	55.44	99.32	162.06	243.69	330.91	412.10	494.12	554.48	614.28	667.43	703.97	726.93
IBD	0.40	0.30	0.43	0.81	1.37	1.81	2.08	2.44	2.46	2.67	2.70	3.15	3.71	4.55	4.64	4.90	4.82	3.81
IHD	0.13	0.16	0.43	1.42	2.37	3.51	5.32	8.34	14.14	22.46	35.37	53.08	78.71	110.78	140.79	168.97	191.91	195.79
PAR	0.00	0.01	0.01	0.02	0.04	0.04	0.05	0.11	0.19	0.35	0.74	1.60	3.48	7.01	13.23	20.18	26.00	28.51
RHA	0.22	0.28	0.79	1.31	1.74	2.40	3.47	5.20	7.99	11.49	15.71	20.47	24.45	27.59	29.78	30.42	28.45	24.82
SCZ	0.02	0.05	0.16	0.92	1.73	1.29	1.14	1.21	1.42	1.61	1.78	1.81	1.93	1.98	2.15	2.21	2.42	2.47
SLE	0.01	0.03	0.13	0.41	0.75	0.89	1.03	1.42	1.74	1.95	1.96	2.16	2.31	2.24	1.78	1.44	1.27	0.54
TDH	0.23	0.42	0.98	2.51	5.65	7.13	9.92	14.49	21.89	29.08	40.02	55.35	77.29	99.50	112.57	123.53	134.10	142.87
MSS	0.01	0.01	0.03	0.12	0.28	0.40	0.54	0.67	0.86	0.85	0.94	1.04	0.95	0.96	0.75	0.67	0.54	0.23

**\*\* Note the age-band "under 1" is not populated with CDL / HIV information. All beneficiaries "Under 1" are included in the "Non CDL" category.**

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