

Original Research Article

Prevalence of chronic diseases in private healthcare sector of South Africa: A threat to public health

Lourens Johannes Rothmann¹, Martha Susanna Lubbe¹, Jan Hendrik Philippus Serfontein¹, Jan Jakobus Gerber¹ and Madeeha Malik^{1,2*}

¹Medicine Usage in South Africa (MUSA), School of Pharmacy, Faculty of Health Sciences, North-West University, Potchefstroom Campus, Potchefstroom, South Africa, ²Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad, Pakistan

*For correspondence: **Email:** madeehamalik15@gmail.com; **Tel:** 0027793624335

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Abstract

Purpose: To evaluate the prevalence of patients suffering from registered chronic disease list (CDL) conditions in a section of the South African private health sector from 2008 - 2012.

Methods: This study was a retrospective analysis of the medicine claims database of a nationally (South African) representative Pharmacy Benefit Management (PBM) company data between 2008 and 2012. Statistical analysis was used to analyse the data. Descriptive analysis was performed to calculate the prevalence of CDL conditions for the entire population, and stratified by age and gender. However, MIXED linear modelling was used to determine changes in the average number of CDL conditions per patient, adjusted for age and gender from 2008 - 2012.

Results: An increase of 0.20 in chronic diseases was observed from 2008 - 2012 in patients having any CDL condition, with an average of 1.57 (1.57 - 1.58, 95 % CI) co-morbid CDL conditions in 2008 and 1.77 (1.77 - 1.78, 95 % CI) in 2012. This increase in average number of CDL conditions per patient between 2008 and 2012 was statistically significant ($p < 0.05$), but with no large practical significance ($d < 0.8$).

Conclusion: Prevalence of patients with CDL conditions along with risk of co-morbidity has been increasing with time in the private health sector of South Africa. Risk of increased co-morbidity with age and among different genders was prevalent.

Keywords: Chronic disease list, Prevalence, Private health sector, Co-morbidity

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INTRODUCTION

Chronic non-communicable diseases (NCDs) such as diabetes, cardiovascular disease (CVD) and cancers pose a major public health threat worldwide. According to an estimate by WHO by 2020, one-third of the global burden of disease will be attributable to chronic diseases [1]. Nearly one-third and 44 % of the deaths before age 60 are due to chronic diseases in middle-income and low income countries, respectively. Various

risk factors including unhealthy diets, physical inactivity, alcohol consumption, poor knowledge of health workers, low quality services and lack of access to medicines have been identified towards contribution of burden of chronic diseases [2]. This rise of burden of chronic diseases in turn has led to high costs of illness and potentially significant productivity losses [3].

The burden of non-communicable diseases as well as multi-morbidity, the co-existence of more

than one chronic condition in one person, is particularly rising in Africa. According to the study conducted by The Global Burden of Disease, HIV ranks first, TB fourth, cerebrovascular disease seventh, diabetes eighth while non-communicable diseases contribute to fifty percent causes of morbidity in South Africa [4]. An estimated increase from 11 to 13 % and 3.2 to 4.0 % since 2009 to 2025, for CDL conditions and multi-morbidity is anticipated [4]. The current situation of increased burden of chronic diseases is a major challenge to existing models of healthcare delivery systems in South Africa. Thus, it is important to recognise such illnesses and strategize appropriately to address them at individual patient care level [5].

To address this dilemma, the South African Council for Medical Schemes formulated a chronic disease list (CDL) including the most common, life-threatening diseases. These conditions fall under a larger group, called prescribed minimum benefits, defined as a set of benefits to ensure that all medical scheme members have access to certain minimum health services; regardless of the benefit option they have selected [6,7]. This has created a positive impact on prescribing practices carried in private healthcare facilities. But, still limited data exists on assessing the prevalence of these particular combinations or clusters of chronic conditions, as most of the studies conducted so far in South Africa have been focused on comorbidities of a specific disease.

Thus, the present study was designed to evaluate the prevalence of patients suffering from registered chronic disease list (CDL) conditions in a section of the South African private health sector from 2008 - 2012.

EXPERIMENTAL

This study was a retrospective analysis of the medicine claims database of a nationally (South African) representative PBM company data between 2008 and 2012. Approval was obtained for the study from the appropriate Pharmacy Benefit Management companies (PBM) as well as from the Ethics Committee of the North-West University (Human, Potchefstroom campus) (no. NWU-0046-08-A5) to conduct this drug utilisation study. The PBM Company provides services to four capitation providers, thirty-two medical schemes and four sick benefit society funds. The medicine benefits of approximately 1.6 million beneficiaries are maintained annually by the PBM company.

The data fields used in this study include: quantity of medication claimed, member gender, member date of birth, NAPPI code, ICD-10 code, diagnose code, active pharmacological ingredient of the medication, number of prescriptions dispensed containing medication used to treat CDL conditions and period in which the item was dispensed. The chronic conditions included in this paper are listed (Table 1).

Table 1: South African chronic disease list (CDL)

Addison's disease	Dysrhythmia
Asthama	Epilepsyl
Bronchiectasis	Glaucoma
Cardiac failure	Haemophilia A
Cardiomyopathy	Haemophilia B
Chronic obstructive pulmonary disease	Hyperlipidemia
Chronic renal disease	Hypertension
Coronoary artery disease	Hypothyroidism
Crohn's disease	Multiple sclerosis
Diabetes insipudus	Parkinson's disease
Diabetes mellitus type I	Rheumatoid arthritis
Diabetes mellitus type II	Schizophrenia
Systemic lupus erythematosus	Ulcerative colitis

Analyses were performed on patient level. The prevalence of each condition was calculated by dividing the number of patients with the condition by the number of active patients. Statistical Analysis System®, SAS 9.3® and Statistical Package for the Social Sciences (IBM SPSS® 22) were used to analyse the data. Descriptive analysis was performed for calculating the prevalence of CDL conditions for the entire population and stratified by age and gender. MIXED linear modelling was used to calculate average number of CDL conditions per patient for the influence of age and gender differences so that the same patients prevalent in 2008 remained also prevalent in 2012. These also involved patients that have either entered or left the medical scheme for any reason or came into the medical scheme any time during the study period under consideration.

RESULTS

Prevalence of patients with at least one CDL condition

The total number of patients on the database were 974,497 patients in 2008, 1,307,528 in 2009, 1,220,289 in 2010, 1,077,834 in 2011 and 1,029,699 patients in 2012. Patients with at least one CDL condition represented 21.9 % (n = 214 279) of the total number of patients on the database in 2008, and they increased to 26 % (n = 268 685) in 2012. The representation of female

patients with at least one CDL condition increased from 23.3 % (2008) to 26.9 % (2012) and those of male patients from 20.3 % (2008) to 25.1 % (2012). There was an increase in the number of patients with CDL conditions across all age groups except for age group ≤ 12 year with a decrease from 2.9 % (2008) to 2.7 % (2012). The other age groups: $12 > \text{age} \leq 50$ years increased from 9.4 % (2008) to 10.7 % (2012); $50 > \text{age} \leq 60$ years increase from 33.6 % (2008) to 40.1 % (2012); $60 > \text{age} \leq 70$ years increased from 57.1 % (2008) to 65 % (2012) and age > 70 years from 71.5 % in 2008 to 77.8 % in 2012. A detail summary is given (Table 2).

The estimated annual increase was also higher for male patients and their associated CDL conditions. All age groups had their highest prevalence in 2012, except for age groups less than 12 and 12 to 50 years. Age group > 70 years had the highest prevalence of patients in all the age groups for the study period in 2012 with 29.3 % (n=78 879). The largest increase in the number of patients with at least one CDL condition were between 2008 and 2012 was for age group > 70 years (36.2 %; n = 20 985) and for chronic conditions (group > 70 years; 51.7 %; n=55 613). Age group > 70 years, thus had the highest estimated annual patient increase of 9 % (n=5 246) and estimated increase in number of CDL conditions of 12.9 % (n=13 903) (Table 3).

Of all the CDL conditions, hypertension had the highest contribution during each of the study years followed by hyperlipidaemia. All 26 conditions, had a patient increase of 139 336 with an estimated annual increase of 34 834. The total number of patients increased by 41.3 % (n = 139 336) between 2008 and 2012 with an estimated annual increase of 10.3 % (n = 34 834). All CDL conditions except bronchiectasis had an overall increase in the number of patients from 2008 until 2012, hypertension had the highest increase (n = 49 531), followed by hyperlipidaemia (n = 35 490) and diabetes mellitus type 2 (n = 17 120). Bronchiectasis had an overall decrease between 2008 and 2012 of 38 patients. The prevalence included patients with a single CDL condition or in combination with other CDL conditions. Diabetes insipidus had the lowest patient increase (n = 3) between 2008 and 2012 (Table 4).

Changes in the number of CDL conditions, adjusted for influence of age and gender

An increase of 0.20 in chronic diseases was observed since 2008-2012 in patients having any

CDL condition with an average of 1.57 (2008) co-morbid CDL conditions to 1.77 in 2012. This difference in increase in average number of CDL conditions per patient between 2008 and 2012 was of statistical significance ($p < 0.05$), but no large practical significance ($d < 0.8$) (Table 5).

All of the CDL conditions had increases in the average number of co-morbid CDL conditions per patient: however, glaucoma, haemophilia B and bronchiectasis were the only CDL conditions with an increase in co-morbid CDL conditions per patient of large practical significance ($d > 0.8$). Asthma (increased by 0.18 co-morbid CDL conditions), hyperlipidaemia (increased by 0.20), hypertension (increased by 0.16), hypothyroidism (increased by 0.67) and diabetes mellitus type 2 (increased by 0.24). Addison's disease (increased by 0.23), coronary artery disease (increased by 0.25), cardiac failure (increased by 0.14), multiple sclerosis (increased by 0.92), Parkinson's disease (increased by 0.25) and chronic obstructive pulmonary disease increased by 0.17 CDL conditions per patient between 2008 and 2012. The CDL condition with the smallest increase in CDL conditions per patient was for schizophrenia with 0.08 and the highest increase for patients with bronchiectasis with 1.07 CDL conditions per patient.

Epilepsy, glaucoma, haemophilia A and haemophilia B had increases of 0.17, 0.15, 0.29 and 0.50 respectively between 2008 and 2012. The only CDL condition with an overall decrease of 0.21 in average number of CDL conditions was chronic renal disease. The CDL condition with the highest number of co-morbid CDL conditions was chronic renal disease with 3.54 in 2008 to 3.37 in 2011. Cardiomyopathy had the highest average number of CDL conditions per patient during 2012 with 3.36. Average number of co-morbidities with hypothyroidism had an overall increase from 2008 with 1.67 to 2012 with 2.34.

DISCUSSION

Chronic Diseases List conditions play a vital role in the consumption of health resources, not only due to the number of patients increasing but also the financial impact on medical schemes, patients and other resources. The present study reported continuous increase of total number of patients with at least one CDL over time. This might be attributed to chronic disease related lifestyle risk factors, increased registration of CDL conditions by medical scheme beneficiaries and increase in the number of medical scheme

Table 2: Prevalence of patients with at least one CDI condition according to the total number of patients on the database

Description			2008	2009	2010	2011	2012
Total number of patients On the database (n)	Gender	Female	538 254	712 305	661 007	578 593	545 068
		Male	436 243	595 223	559 282	499 237	484 627
	Age Group (Years)	> 12	124 440	192 387	175 664	156 805	146 296
		≤ 12 -> 50	524 962	705 064	640 480	557 250	523 587
		≤ 50 -> 60	154 659	191 661	182 559	160 018	156 430
		≤ 60 -> 70	89 570	115 114	114 697	102 425	102 047
	Total	≤ 70	80 866	103 302	106 889	101 336	101 339
Total		974 497	1 307 528	1 220 289	1 077 834	1 029 699	
Total number of patients With at least one CDL Condition (n)	Gender	Female	125 548 (23.3 %)	142 690 (20 %)	140 133 (21.2 %)	129 192 (22.3 %)	146 678 (26.9 %)
		Male	88 731 (20.3%)	112 244 (18.8 %)	111 062 (19.8 %)	104 159 (20.8 %)	122 007 (25.1 %)
	Age Group (Years)	> 12	3 611 (2.9 %)	4511 (2.3 %)	2 273 (2.4 %)	4165 (2.6 %)	4 088 (2.7 %)
		≤ 12 -> 50	49 519 (9.4 %)	60 697 (8.6 %)	57 516 (8.9 %)	52 628 (2.6 %)	56 479 (10.7%)
		≤ 50 -> 60	52 040 (33.6 %)	61 735 (32.2 %)	60 167 (32.9 %)	54 364 (9.4 %)	62 851 (40.1%)
		≤ 60 -> 70	51 215 (57.1 %)	60 026 (52.1 %)	59 716 (52%)	54 988 (33.9 %)	66 388 (65 %)
	Total	≤ 70	57 894 (71.5 %)	67 965 (65.7 %)	69 523 (65 %)	67 206 (53.6 %)	78 879 (77.8 %)
Total		214 279 (21.9 %)	254 934 (19.4 %)	251 195 (20.5 %)	233 351 (21.6 %)	268 685 (26 %)	
Total number of items on the database (n)	Gender	Female	9 893 928	12 834 715	12 103 038 *	10 327 159 *	9 237 012 *
		Male	6 545 325	8 814 276	8 424 739 *	7 439 420 *	7 172 238 *
	Age Group (Years)	> 12	1 085 511	1 727 830	1 552 825	1 303 782	1 209 684
		≤ 12 -> 50	6 416 499	8 347 338	7 604 671	6 378 677	5 906 537
		≤ 50 -> 60	3 288 346	4 153 722	3 945 088	3 384 147	3 280 626
		≤ 60 -> 70	2 585 064	3 418 324	3 366 712	2 945 546	2 876 437
	Total	≤ 70	3 063 833	4 001 777	4 058 470	3 754 442	3 136 008
Total		16 439 253	21 648 991	20 527 766	17 766 594	16 409 292	
Total number of CDL conditions items (n)	Gender	Female	1 376 575 (13.9 %)	1 804 555 (14 %)	1 728 965 (14.9 %)	1 735 386 (16.8 %)	1 551 209 (16.7 %)
		Male	1 174 733 (17.9 %)	1 526 551 (17.3 %)	1 480 315 (17.5 %)	1 515 603 (20.3 %)	1 513 911 (21.1 %)
	Age Group (Years)	> 12	20 380 (1.8 %)	43 014 (2.4 %)	39 469 (2.5 %)	40 356 (3 %)	34 964 (2.8 %)
		≤ 12 -> 50	445 947 (6.9 %)	578 377 (6.9 %)	541 606 (7.1 %)	554 426 (8.6 %)	520 912 (8.8 %)
		≤ 50 -> 60	589 949 (17.9 %)	746 537 (17.9 %)	710 961 (18 %)	712 964 (21 %)	712 071 (21.7 %)
		≤ 60 -> 70	646 249 (25 %)	837 411 (24.5 %)	807 093 (23.9 %)	817 432 (27.7 %)	822 188 (28.5%)
	Total	≤ 70	848 783 (27 %)	1 125 767 (28.1 %)	1 110 151 (27.3 %)	1 124 811 (29.9 %)	974 985 (31 %)
Total		2 551 308 (15.5 %)	3 331 106 (15.3 %)	3 209 280 (15.6 %)	3 249 989 (18.2 %)	3 065 120 (18.6 %)	

Note: All percentages are expressed as a percentage of the equivalent group on the total database.* (2010)- Unidentified patients (n=11; R1 045.66), (2011)- Unidentified patients (n=15; R316.05), (2012- Unidentified patients (n=42; R1 334.97)

Table 3: Change in number of patients with at least one CDL condition and the total number of CDL conditions, stratified according to age and gender

Description	2008		2012		Patient change (2008 vs 2012) (n)	Chronic disease change (2008 vs 2012) (n)	Estimated annual patient change (n)	Estimated annual chronic disease change (n)	
	Patients (n)	Chronic diseases (n)	Patients (n)	Chronic diseases (n)					
Gender	Female	125 548	193 182	146 678	258 263	↑ 21 130 (16.8%)	↑ 65 081 (33.6%)	↑ 5 283 (4.2%)	↑ 16 270 (8.4%)
	Male	88 731	144 200	122 007	218 455	↑ 33 276 (37.5%)	↑ 74 255 (51.4%)	↑ 8 319 (9.3%)	↑ 18 564 (12.8%)
Age Group (Years)	> 12	3 611	3 654	4 088	4 137	↑ 477 (13.2%)	↑ 483 (13.2%)	↑ 119 (3.3%)	↑ 121 (3.3%)
	≤ 12 -> 50	49 519	63 090	56 479	77 362	↑ 6 960 (14%)	↑ 14 272 (22.6%)	↑ 1 740 (3.5%)	↑ 3 568 (5.6%)
	≤ 50 -> 60	52 040	77 881	62 851	105 427	↑ 10 811 (17.2%)	↑ 27 546 (35.3%)	↑ 2 703 (4.3%)	↑ 6 887 (8.8%)
	≤ 60 -> 70	51 215	85 375	66 388	126 797	↑ 15 173 (29.6%)	↑ 41 422 (48.5%)	↑ 3 793 (7.4%)	↑ 10 356 (12.1%)
	≤ 70	57 894	107 382	78 879	162 995	↑ 20 985 (36.2%)	↑ 55 613 (51.7%)	↑ 5 246 (9%)	↑ 13 903 (12.9%)

Table 4: Prevalence of patients with all individual CDL conditions per condition

CHRONIC DISEASE	2008		2009		2010		2011		2012		Change (2008 vs 2012) (n)	Estimated annual change (n)
	Patients (n)	%	Patients (n)	%	Patients (n)	%	Patients (n)	%	Patients (n)	%		
<i>Hypertension</i>	57 627	44.4	70 058	50.1	69 193	50.7	62 909	50.9	69 248	50.8	↑ 11 621 (20.1%)	↑ 2 905 (5%)
<i>Hypothyroidism</i>	24 558	18.9	11 824	8.4	11 899	8.7	10 658	8.6	11 724	8.6	↓ 12 834 (52.2%)	↓ 3 209 (13%)
<i>Hyperlipidaemia</i>	15 239	11.7	18 385	13.1	17 778	13	15 002	12.1	18 216	13.3	↑ 2 977 (12.1%)	↑ 744 (3%)
<i>Asthma</i>	12 139	9.3	14 559	10.4	14 107	10.3	13 586	10.9	13 803	10.1	↑ 1 664 (13.7%)	↑ 416 (3.4%)
<i>Diabetes Mellitus Type 2</i>	6 158	4.74	7 425	5.3	7 097	5.2	6 393	5.1	7 133	5.2	↑ 975 (15.8%)	↑ 244 (3.9%)
<i>Epilepsy</i>	3 770	2.9	4 991	3.5	4 635	3.4	4 101	3.3	4 665	3.4	↑ 895 (23.7%)	↑ 224 (5.9%)
<i>Diabetes Mellitus Type 1</i>	2 912	2.2	2 199	1.5	1 744	1.2	1 952	1.5	1 656	1.2	↓ 1 256 (43.1%)	↓ 314 (10.7%)
<i>Glaucoma</i>	1 622	1.2	1 967	1.4	1 987	1.4	1 817	1.4	2 185	1.6	↑ 563 (34.7%)	↑ 141 (8.6%)
<i>Cardiac failure</i>	1 271	0.9	2 402	1.7	2 277	1.6	1 861	1.5	2 227	1.6	↑ 956 (75.2%)	↑ 239 (18.8%)
<i>Rheumatoid arthritis</i>	872	0.6	1 109	0.7	1 108	0.8	1 042	0.8	1 257	0.9	↑ 385 (44.1%)	↑ 96 (11%)
<i>Dysthyrthmia</i>	759	0.5	902	0.6	900	0.6	809	0.6	846	0.6	↑ 87 (11.4%)	↑ 22 (2.8%)

Cardiomyopathy	606	0.4	474	0.3	416	0.3	349	0.2	270	0.2	↓ 336 (55.4%)	↓ 84 (13.8%)
Coronary artery disease	588	0.4	781	0.5	641	0.4	991	0.8	562	0.3	↓ 26 (4.4%)	↓ 7 (1.1%)
Parkinson's disease	531	0.4	645	0.4	642	0.4	568	0.4	598	0.4	↑ 67 (12.6%)	↑ 17 (3.1%)
Chronic obstructive pulmonary disease	421	0.3	578	0.4	538	0.3	451	0.3	504	0.3	↑ 83 (19.7%)	↑ 21 (4.9%)
Crohn's disease	100	0.0	239	0.1	232	0.1	218	0.1	237	0.1	↑ 137 (137%)	↑ 34 (34.2%)
Multiple sclerosis	63	0.05	315	0.2	293	0.22	198	0.16	171	0.13	↑ 108 (171.4%)	↑ 27 (42.8%)
Ulcerative colitis	42	0.03	92	0.07	77	0.06	71	0.06	84	0.06	↑ 42 (100%)	↑ 11 (25%)
Addison's disease	40	0.03	42	0.03	36	0.03	37	0.03	38	0.03	↓ 2 (5%)	↓ 1 (1.2%)
Systemic lupus erythematosus	38	0.03	51	0.04	59	0.04	49	0.04	65	0.05	↑ 27 (71%)	↑ 7 (17.7%)
Bronchiectasis	36	0.03	36	0.03	30	0.02	21	0.02	4	0.00	↓ 32 (88.8%)	↓ 8 (22.2%)
Haemophilia A	20	0.02	27	0.02	31	0.02	35	0.03	30	0.02	↑ 10 (50%)	↑ 3 (12.5%)
Diabetes insipidus	10	0.01	7	0.01	10	0.01	8	0.01	8	0.01	↓ 2 (20%)	↓ 1 (5%)
Chronic renal disease	9	0.01	36	0.03	33	0.02	29	0.02	82	0.06	↑ 73 (811.1%)	↑ 18 (202.7%)
Haemophilia B	1	0.00	1	0.00	1	0.00	1	0.00	2	0.00	↑ 1 (100%)	↑ 1 (25%)
Total	129 799	100.00	139 634	100.00	136 224	100.00	123 580	100.00	136 097	100.00	↑ 6 298 (4.8%)	↑ 1 575 (1.2%)

Table 5: Average number of CDL conditions per patient, adjusted for age and gender

Diagnosis	Total Number of patients (2008-2012)	Year	Mean (number of CDL conditions/patients)	Standard Error	Confidence interval (95 % CI)	p-value	Effect size (d-value)
All CDL conditions	1 222 444	2008	1.57	0.00	1.57-1.58	0.00	0.22
		2009	1.68	0.00	1.67-1.68		
		2010	1.69	0.00	1.68-1.69		
		2011	1.72	0.00	1.71-1.72		
		2012	1.77	0.00	1.77-1.78		

beneficiaries as reported by the pharmaceutical benefit company used in this study. Similar increased burden of disease associated with chronic conditions was reported by a study conducted in twenty three different countries [8].

The current study reported higher prevalence of CDL conditions in female patients as compared to male patients since 2008 to 2012. Higher prevalence of non-communicable disease in females was also reported by other studies conducted in South Africa and Germany[9,10]. Findings from another study conducted in United States reported higher prevalence of co-morbid chronic conditions in females as compared to males [11].

The present study found an increase in CDL conditions proportionate to increase in age. This might be due to the fact that people live longer than before. According to a survey, one in twenty people were aged 65 years and older a century ago, however, the proportion was one in six in 2011 and it has been estimated that by 2050, the proportion will be one in four with chronic disease. This situation will lead to an increase risk of CDL conditions such as hypertension, hyperlipidaemia and diabetes associated with aging [8]. The results of conducted in the United States showed that prevalence of co-morbid chronic conditions increase with increase in age. Higher prevalence of non-communicable diseases in elderly was also reported by another study conducted in South Africa [12].

It has been estimated that deaths associated with all chronic diseases globally, may increase from 61 % of the total disease burden in 2005 to 71 % in 2030. On the other hand, deaths from cardiovascular disease and chronic respiratory disease may increase from 33 to 36 % and 8 to 12 % of the total disease burden by 2030 [8]. The findings of the current study revealed that chances of co-morbidities in individual patients with a CDL condition are high. Chronic renal disease was the only CDL condition with patients having an overall decrease in co-morbidity, although the average was still higher than the other conditions over the majority of the study period. This higher co-morbidity prevalence might be due to associated risk factors, such as hypertension, diabetes mellitus type 2 and obesity.

The high average number of co-morbid CDL conditions for coronary artery disease, may be attributed to diabetes mellitus type 2 and hyperlipidaemia, as being most commonly prevalent CDL condition [13]. The present study

reported hypertension and hyperlipidaemia among the top three most prevalent chronic diseases. These results are in line with similar findings from another study conducted in South Africa [14]. Another study conducted in United States confirmed hypertension and hyperlipidaemia currently as the most prevalent chronic diseases [15]. The increase in burden of chronic diseases will result in use of complex drug regimens which in turn will not only increase cost of therapy but will also promote issues related to unwanted side effects, drug-drug interactions, resistance and patient non-compliance.

Limitations of the study

The results of the study are based on the data from the medicine claims database of a nationally (South African) representative PBM company and might not be generalized to the entire country.

CONCLUSION

The prevalence of patients with CDL conditions along with risk of co-morbidity has been increasing with time in private healthcare sector of South Africa. Individual patients with any of the CDL conditions acquired on average at least one additional CDL co-morbidity (except for chronic renal disease), especially, when other CDL conditions were known as risk factors. Risk of increase co-morbidities with age and among different genders was prevalent. The current situation will easily overwhelm healthcare system as awareness regarding the magnitude and consequences of increased chronic disease burden as well as the capacity to respond appropriately with cost-effective measures is still low. Thus, this calls for more extensive research to recognise and accommodate the impact of the increased chronic disease burden to address this public health concern appropriately, especially in the private healthcare section of South Africa.

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DECLARATIONS

Conflict of Interest

No conflict of interest associated with this work.

Contribution of Authors

The authors declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by them.

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