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Medicine Expenditure Trends in Côte d'Ivoire

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ABSTRACT

Background: Expenditure related to medicines has increased significantly in several countries. This study aimed to describe medicine expenditure trends at the Mutual Insurance Company for Civil Servers and Agents of the State of Côte d'Ivoire (MUGEFCI) between 2014 and 2018.

Methods: We conducted a retrospective analysis of the medicine expenditure of the MUGEFCI. Beneficiaries who used at least one drug reimbursed between 1st January 2014 and 31st December 2018 were included in the study. Expenditure was estimated on the basis of public pharmacy prices. They were described by ATC class and by age group.

Results: In 2014, the medicine expenditure was XOF 14.720 billion (approximately € 22.44 million), which increased by 63.21% in 2018. The medicine classes that incurred the highest expenditures were, for the first level (ATC main group), anti-infectives for systemic use (23.84%) and cardiovascular medicines (15.23%). Anti-parasitic products, insecticides and repellents (9.79%) and medicines for the alimentary tract and metabolism (9.67%) were also used. Total expenditure was most important for young adults aged 35-45 years.

Conclusion: Medicine expenditures have increased significantly. The rational use of medicines and control of the expenditure they generate is a major challenge to guarantee access to medicines.

Keywords: Medicine Expenditure, ATC System, Africa, Mutual Insurance Company, Retrospective Analysis

Introduction

As a result of their curative and preventive properties against human diseases, medicines are essential for correcting and restoring health [1]. However, access to medicines entails considerable expenditures, which are often difficult for payers to bear [2-5]. Medicine expenditures cover all expenditures on prescription and nonprescription medicines [6]. They are a major component of healthcare expenditures [7]. In recent decades, this expenditure has risen sharply in several countries [8]. In OECD countries, medicine expenditures were estimated at approximately 800 billion US dollars, representing, on average, 20% of healthcare expenditures in 2013 {6]. In 2019, these countries represented the third largest item of healthcare expenditure after hospital and outpatient care. That same year, healthcare expenditures accounted for 25.8% to 34.4% of healthcare expenditures in some of the organisation's countries [8]. In developing countries, they account for 25% to 70% of total healthcare expenditures [6].

Most of the studies describing trends in medicine expenditure have been carried out in developed countries using data from a variety of sources, including health insurance data [9-11]. in Africa, this expenditure remains poorly documented. The studies available focus on a few classes of drugs [12-13].

In sub-Saharan Africa, healthcare expenditures (and medicine expenditures) used to be subsidised by governments, so basic healthcare was free for the population. Since the Bamako initiative in 1987, funding has included a financial contribution from the population through cost recovery. Given the considerable withdrawal of the public sector from health financing, collective financing systems such as health insurance (public or private) and mutual health organisations have emerged over the last few decades [14]. Côte d'Ivoire is no stranger to the proliferation of health insurance and mutual health insurance in Africa. Private sector companies have set up health insurance schemes to cover their employees' medical care and medicines. For civil servants and government employees and their dependents, the Mutual Insurance Company for civil servants and agents of the State of Côte d'Ivoire (MUGEFCI) provides social health insurance. Little is known about medicine expenditure in the country. The purpose of this study was to describe MUGEFCI medicine expenditure trends.

Methods

1. Type of study and data source

A retrospective study of medicine expenditures among MUGEFCI beneficiaries was conducted over the period of 2014-2018. Founded in 1973, the MUGEFCI has the longest experience with social health insurance in Côte d'Ivoire, with 750,042 beneficiaries (approximately 3.3% of the Ivorian population in 2014). In addition to hospitalisation and other outpatient care, the MUGEFCI covers medicine expenses for active and retired civil servants and government employees and their dependents, depending on the regime subscribed to [15]. MUGEFCI's operations underwent significant changes after 2018.These changes were disrupted by the Covid 19 crisis, so this analysis focuses on the 2014-2018 period, which was relatively more stable.

2. Population

The study population consisted of MUGEFCI members and beneficiaries. The participants included in the study were people of all ages who had used at least one drug prescribed by a medical doctor and reimbursed by the mutual insurance company over the period of 2014--2018; all the regimes included. People with missing data on nature (in terms of international nonproprietary names) and the number of medicines used were not included. We assumed that a medicine had been used if it had been prescribed by a doctor and dispensed in a pharmacy.

3. Variables

The data collected were as follows:

- a unique and anonymous identifier for the beneficiary;
- the beneficiary's age, expressed in completed years. Age was then grouped into categories;
- gender, a binary qualitative variable with the following modalities: male and female;
- the health region in which the beneficiary resided;
- the scheme was divided into three categories:

- the “basic regime”, now known as the “basic supplementary scheme”: in addition

to dental and optical care, beneficiaries of the basic regime had 70% of their drug costs covered by MUGEFCI;

- the "Ivoir'Santé" scheme: beneficiaries under this scheme had their outpatient and hospitalisation expenses covered by MUGEFCI;
- the "basic regime + Ivoir'santé", for beneficiaries of the two abovementioned schemes

- the year of issue of each medicine used;
- the international nonproprietary name of each medicinal product used;
- the number of packaging units (or 'boxes') of the medicinal product used;
- the retail price of each drug used, excluding copayment.
- individual annual expenditure. This corresponded to the sum of the selling prices of medicines dispensed in pharmacies in one year to a beneficiary without taking into account the copayment. Expenditure was expressed in XOF currency. Once the data had been collected, the drugs used were classified according to the ATC DDD system. In this system, drugs are classified into groups at five different levels. The first level indicates the main anatomical group. The second level indicates the main therapeutic group. The third and fourth levels are chemical/therapeutic/pharmacological subgroups. The fifth level indicates chemical substance [16].

4. Data analysis

Data were acquired from the MUGEFCI database via Excel spreadsheets and analysed via RStudio and Excel 2019 software. The numbers and proportions of beneficiaries belonging to each sociodemographic category were described. Expenditure was estimated for each main ATC group (first and second level) and for each age group over the years. Table 1 displays the ATC classes in the first- and second-level therapeutic subgroups used in this study.

Table 1: ATC classes in the first- and second-level therapeutic subgroups used in this study

ATC first level	ATC second level
A : Alimentary tract and metabolism	A02 : Drugs for acid related disorders
B : Blood and blood forming organs	A03 : Drugs for functional gastrointestinal disorders
C : Cardiovascular system	A10 : Drugs used in diabetes
D : Dermatologicals	B03 : Antianemic preparations
G : Genito urinary system and sex hormones	C07 : Beta blocking agents
H : Systemic hormonal preparations, excl. sex hormones and insulins	C08 : Calcium channel blockers
J : Antiinfectives for systemic use	C09 : Agents acting on the renin-angiotensin system
L : Antineoplastic and immunomodulating agents	C10 : Lipid modifying agents
M : Musculo-skeletal system	D01 : Antifungals for dermatological use
N : Nervous system	H02 : Corticosteroids for systemic use
P : Antiparasitic products, insecticides and repellents	J01 : Antibacterials for systemic use
R : Respiratory system	J07 : Vaccines
S : Sensory organs	M01 : Anti-inflammatory and antirheumatic products
V : Various	N02 : Analgesics
	P01 : Antiprotozoals
	P02 : Anthelmintics
	R01 : Nasal preparations
	R05 : Cough and cold preparations
	R06 : Antihistamines for systemic use
	S01 : Ophthalmologicals

The average annual growth rate (AAGR) for the main ATC groups and the second-level therapeutic subgroup was calculated.

5. Ethical considerations

The research protocol was validated by the scientific committee of the School of Pharmacy of Abidjan. The study was approved by the board of the MUGEFCI. The data were collected with respect to confidentiality.

Result

1. Sociodemographic characteristics

In 2014, 314,631 people used at least one drug reimbursed by the MUGEFCI. The overall number of users increased by 41.75% between 2015 and 2018. The majority of these users were entitled beneficiaries (59.5% to 60.8%), subscribers to the basic regime (68.1% to 70.4%) and male (53.8% to 54.9%). The average age was approximately 27 years. People aged over 65 represented 2 to 3% of the sample. Approximately four out of ten users (39.5% to 40.5%) were under the age of 15. Most of them lived in Abidjan and its neighboring regions (51.2% to 64.8%). The sociodemographic characteristics are shown in Table 2.

Table 2: Sociodemographic characteristics

	2014		2015		2016		2017		2018		AAGR*
	N	%	N	%	N	%	N	%	N	%	%
Sex											
- Male	171,771	54.6	206,266	54.9	205,813	54.5	225,630	54.1	239,870	53.8	8.9
- Female	142,860	45.4	169,360	45.1	171,661	45.5	191,225	45.9	206,112	46.2	9.8
Age											
Mean ± SD	26.57± 20.03		26.69 ± 20.09		26.83± 20.32		27.00± 20.33		26.81± 20.37		
- <5	49,256	15.7	58,201	15.5	60,753	16.1	62,745	15.1	66,518	14.9	8.0
- [5,15[	74,959	23.8	90,572	24.1	90,108	23.9	102,747	24.7	114,205	25.6	11.4
- [15,25[	30,565	9.7	35,588	9.5	32,535	8.6	38,853	9.3	41,152	9.2	8.3
- [25,35[	37,005	11.8	41,359	11.0	40,661	10.8	40,923	9.8	41,241	9.2	2.9
- [35,45[	55,779	17.7	69,808	18.6	72,443	19.2	81,233	19.5	88,331	19.8	12.5
- [45,55[	35,188	11.2	40,923	10.9	40,370	10.7	44,560	10.7	46,430	10.4	7.4
- [55,65[	22,576	7.2	27,735	7.4	28,497	7.5	31,758	7.6	32,662	7.3	10.0
- [65,75[	7,317	2.3	8,975	2.4	9,544	2.5	11,055	2.7	11,619	2.6	12.5
- ≥75	1,986	0.6	2,465	0.7	2,563	0.7	2,981	0.7	3,824	0.9	18.2
Status											
- Main subscriber	126,802	40.3	151,314	40.3	152,801	40.5	166,136	39.9	174,897	39.2	8.6
- Entitled beneficiary	187,829	59.7	224,312	59.7	224,673	59.5	250,719	60.1	271,085	60.8	9.8
Type of subscription											
- Basic Regime (RB)	217,833	69.2	261,505	69.6	260,885	69.1	287,362	68.9	313,964	70.4	9.8
- Ivoir'Santé (IS)	5,928	1.9	5,431	1.5	3,587	1.0	2,915	0.7	1,198	0.3	-30.0
- RB + IS	90,870	28.9	108,690	28.9	113,002	29.9	126,578	30.4	130,820	29.3	9.7
Residence											
- Abidjan and around	182,287	57.9	243,291	64.8	193,110	51.2	219,970	52.8	226,243	50.7	7.4
- Other regions	132,344	42.1	132,335	35.2	184,364	48.8	196,885	47.2	219,739	49.3	14.4
Total	314,631	100.00	375,626	100.00	377,474	100.0	416,855	100.00	445,982	100.00	9.3

*** AAGR = Average Annual growth rate**

2. Medicine expenditure trends between 2014 and 2018

The total expenditure on medicines amounted to XOF 95.176 billion, or approximately €146 million. A slight decrease in expenditures was reported in 2016, but overall expenditures on medicines increased by 63.21%. Figure 1 showed the changes in expenditures on medicines in the MUGEFCI from 2014 to 2018.

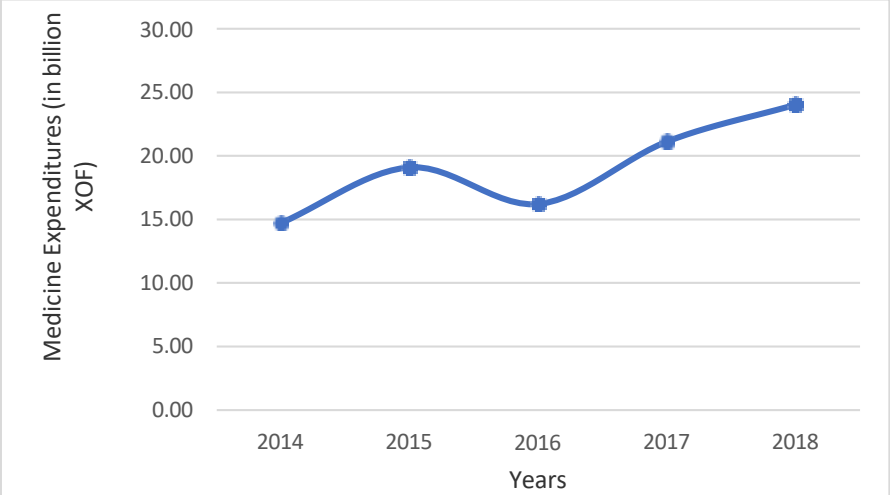

Figure 1: Yearly medicine expenditure trends at the MUGEFCI from 2014 to 2018 (1 EUR = 655.957 XOF)

3. Medicine expenditure by main therapeutic class

Table 3 showed the annual medicine expenditures by main therapeutic class in the MUGEFCI for the years 2014-2018. The ATC classes that accounted for the highest expenditure were anti-infectives for systemic use (23.84%) and cardiovascular medicines (15.23%). They were followed by antiparasitic products, insecticides and repellents (9.79%) and medicines for the alimentary tract and metabolism (9.67%). These four classes of medicine were responsible for approximately sixty percent of the expenditure (58.53%). More than 20% of the mean annual growth in expenditure was reported for various medicines (23,46%), antineoplastic and immunomodulating agents (21.73%) and medicines alimentary to metabolism (20.08%).

Table 3: Annual expenditure (in billion XOF) by ATC class at the MUGEFCI from 2014--2018 (1 EUR = 655.957 XOF)

	2014		2015		2016		2017		2018		2014-2018		AAGR
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	%
A	**1.238**	**8.41**	**1.754**	**9.19**	**1.608**	**9.92**	**2.174**	**10.29**	**2.429**	**10.11**	**9.202**	**9.67**	**20.08**
B	0.998	6.78	1.195	6.26	1.016	6.27	1.490	7.05	1.890	7.87	6.589	6.92	19.56
C	**2.294**	**15.59**	**2.815**	**14.74**	**2.529**	**15.60**	**3.274**	**15.50**	**3.591**	**14.95**	**14.503**	**15.24**	12.92
D	0.525	3.57	0.714	3.74	0.592	3.65	0.797	3.77	0.991	4.13	3.620	3.80	19.45
G	0.290	1.97	0.373	1.95	0.309	1.91	0.410	1.94	0.458	1.91	1.840	1.93	14.01
H	0.233	1.58	0.302	1.58	0.256	1.58	0.338	1.60	0.376	1.56	1.504	1.58	14.47
J	**3.528**	**23.97**	**4.698**	**24.60**	**3.843**	**23.71**	**4.986**	**23.60**	**5.732**	**23.86**	**22.788**	**23.94**	14.92
L	0.203	1.38	0.294	1.54	0.280	1.73	0.416	1.97	0.410	1.71	1.602	1.68	**21.73**
M	0.842	5.72	1.104	5.78	0.918	5.66	1.222	5.78	1.366	5.69	5.452	5.73	14.78
N	0.898	6.10	1.165	6.10	0.968	5.97	1.204	5.70	1.408	5.86	5.642	5.93	13.54
P	**1.631**	**11.08**	**2.026**	**10.61**	**1.631**	**10.06**	**1.938**	**9.18**	**2.092**	**8.71**	**9.319**	**9.79**	7.86
R	1.109	7.53	1.448	7.58	1.189	7.34	1.493	7.07	1.675	6.97	6.914	7.26	12.63
S	0.929	6.31	1.206	6.31	1.069	6.59	1.382	6.54	1.605	6.68	6.190	6.50	15.95
V	0.001	0.01	0.002	0.01	0.002	0.01	0.004	0.02	0.002	0.01	0.012	0.01	**23.46**
Total	14.720	100.00	19.097	100.00	16.210	100.00	21.125	100.00	24.025	100.00	95.176	100.00	14.67

4. Medicine expenditure trends by age group

Expenditures by age group are shown in Table 4. The increase in expenditure affected all age groups, with annual proportions ranging from 9.63% to 23.28%. Approximately 50% of expenditures are recorded among people aged 35-65 years. From 2014 to 2018, the highest expenditure (approximately 20%) was for young adults aged 35-45 years. The annual growth in expenditure was most important for people older than 65 years (17.29% to 23.28%) and those aged 35-45 years (19.30%).

Table 4: Annual expenditures (in billion XOF) by age group at the MUGEFCI from 2014 to 2018 (1 EUR = 655.957 XOF)

	2014		2015		2016		2017		2019		2014-2018		AAGR
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	%
<5	1.769	12.02	2.212	11.58	1.829	11.28	2.196	10.40	2.448	10.19	10.453	10.98	9.82
[5,15[	1.770	12.02	2.223	11.64	1.897	11.70	2.497	11.82	2.958	12.31	11.345	11.92	**15.25**
[15,25[	0.781	5.31	0.969	5.08	0.762	4.70	1.023	4.84	1.156	4.81	4.691	4.93	12.49
[25,35[	1.550	10.53	1.951	10.22	1.580	9.75	1.895	8.97	2.118	8.81	9.094	9.56	9.63
[35,45[	**2.732**	**18.56**	**3.815**	**19.98**	**3.263**	**20.13**	**4.391**	**20.78**	**5.158**	**21.47**	**19.359**	**20.34**	**19.30**
[45,55[	**2.338**	**15.89**	**2.980**	**15.60**	**2.485**	**15.33**	**3.203**	**15.16**	**3.508**	**14.60**	**14.515**	**15.25**	12.31
[55,65[	**2.310**	**15.69**	**3.020**	**15.81**	**2.699**	**16.65**	**3.582**	**16.95**	**3.928**	**16.35**	**15.538**	**16.33**	**15.61**
[65,75[	1.100	7.47	1.450	7.59	1.271	7.84	1.777	8.41	1.953	8.13	7.552	7.93	**17.29**
≥75	0.369	2,50	0.477	2.50	0.424	2.61	0.560	2.65	0.799	3.33	2.629	2.76	**23.28**
Total	14.720	100.00	19.097	100.00	16.210	100.00	21.125	100.00	24.025	100.00	95.176	100.00	14.67

4.1. Anti-infectives for systemic use (J) and cardiovascular medicines (C) by age group

Expenditures on anti-infectives for systemic use (J) by age group are shown in Figure 2. Young adults aged 35-45 presented the highest expenditure rate (23.67%) and the highest annual growth in expenditure (28.28%) from 2014 to 2018. Children and adolescents (younger than 15 years) accounted for approximately 33% of the systemic antibiotic use expenditures.

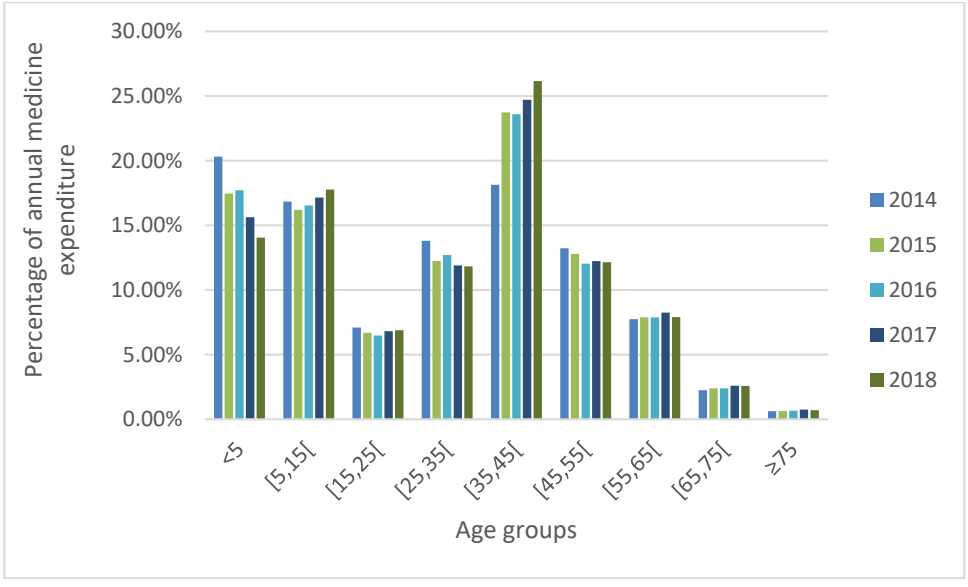

Figure 2: Percentages of annual expenditure (in billion XOF) on anti-infectives for systemic use (J) by age group at the MUGEFCI from 2014 to 2018

Expenditure on cardiovascular drugs (C), as described in Figure 3, rose sharply from the ages of 35-45 years. It peaks between the ages of 55 and 65 and decreases at older ages.

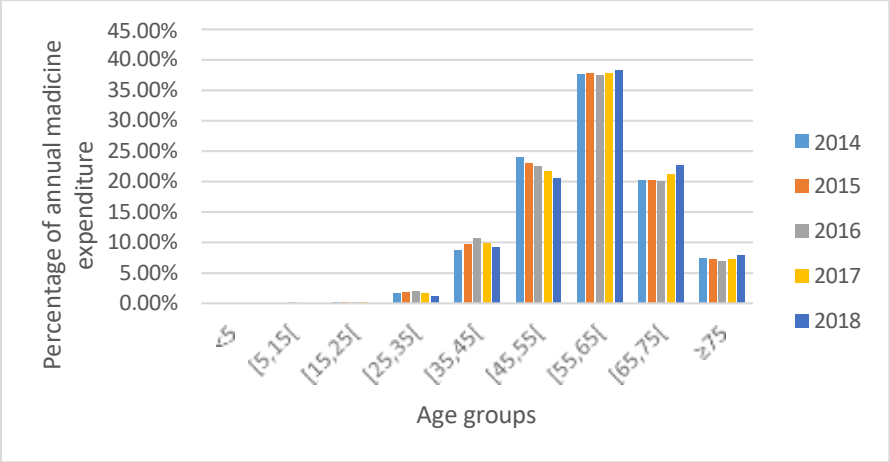

Figure 3: Percentages of annual expenditure (in billion XOF) on cardiovascular (C) medicines by age group at the MUGEFCI from 2014 to 2018

4.2. Medicine expenditure for the second-level therapeutic subgroup

Table 5 displays the expenditures of the top twenty therapeutic classes of the second-level therapeutic class, which accounted for approximately 86% of the total medicine expenditures from 2014 to 2018. The medicine classes that accounted for the highest expenditure were antibacterials for systemic use (25.8%), followed by agents that act on the renin–angiotensin system (10.9%) and antiprotozoals (9.7%). More than 20% of the mean annual growth in expenditure was attributed to drugs used for the treatment of diabetes (A10) and lipid-modifying agents (C10).

Table 5: Contribution of the top 20 classes in the second-level therapeutic subgroup to total medicine expenditure (in billion XOF) in MUGEFCI, 2014-2018 (1 EUR = 655.957 XOF).

		2014		2015		2016		2017		2018		2014-2018		AAGR
		Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	%
1	**J01**	**3.2**	**21.8**	**4.3**	**22.4**	**3.5**	**21.9**	**4.7**	**22.0**	**5.5**	**22.9**	**21.2**	**22.3**	16.1
2	**C09**	**1.4**	**9.2**	**1.7**	**9.0**	**1.6**	**9.7**	**2.1**	**9.7**	**2.2**	**9.3**	**9.0**	**9.5**	14.2
3	**P01**	**1.3**	**8.7**	**1.6**	**8.6**	**1.3**	**8.2**	**1.7**	**8.2**	**2.0**	**8.4**	**8.0**	**8.4**	13.7
4	B03	0.9	6.2	1.1	5.7	0.9	5.5	1.3	6.2	1.7	7.1	5.9	6.2	18.9
5	S01	0.9	5.8	1.1	5.9	1.0	6.2	1.3	6.2	1.5	6.4	5.8	6.1	16.6
6	M01	0.7	4.5	0.9	4.7	0.7	4.5	1.0	4.7	1.1	4.7	4.4	4.6	15.7
7	**A10**	0.5	3.4	0.7	3.9	0.8	4.7	1.1	5.0	1.2	4.8	4.2	4.4	**24.7**
8	N02	0.7	4.4	0.9	4.5	0.7	4.4	0.9	4.3	1.1	4.4	4.2	4.4	14.4
9	R06	0.4	2.9	0.6	2.9	0.4	2.7	0.6	2.7	0.7	2.8	2.7	2.8	13.8
10	A02	0.4	2.4	0.5	2.6	0.4	2.7	0.6	2.7	0.7	2.9	2.5	2.6	19.8
11	C08	0.4	2.5	0.4	2.2	0.3	2.1	0.4	2.0	0.5	1.9	2.0	2.1	6.7
12	R01	0.3	2.0	0.4	2.1	0.3	2.0	0.4	1.9	0.5	1.9	1.9	2.0	13.3
13	D01	0.2	1.7	0.3	1.8	0.3	1.6	0.3	1.6	0.4	1.6	1.6	1.7	14.9
14	R05	0.2	1.5	0.3	1.6	0.3	1.7	0.3	1.6	0.4	1.6	1.5	1.6	15.1
15	H02	0.2	1.5	0.3	1.5	0.2	1.5	0.3	1.6	0.4	1.5	1.5	1.6	14.6
16	**C10**	0.2	1.1	0.2	1.2	0.2	1.5	0.3	1.6	0.4	1.7	1.4	1.5	**26.8**
17	A03	0.2	1.4	0.3	1.4	0.2	1.3	0.3	1.3	0.3	1.2	1.2	1.3	10.6
18	P02	0.3	2.2	0.4	2.0	0.3	1.8	0.2	0.9	0.0	0.2	1.2	1.3	-29.4
19	C07	0.2	1.2	0.2	1.1	0.2	1.1	0.2	1.1	0.3	1.1	1.1	1.2	9.5
20	J07	0.3	2.0	0.3	1.4	0.2	1.1	0.1	0.7	0.0	0.2	0.9	0.9	-32.9
Sub-total		12.9	86.4	16.5	86.5	14.0	86.2	18.2	86.0	20.8	86.6	82.2	86.3	86.3%
Grand-total		14.7	100.0	19.1	100.0	16.2	100.0	21.1	100.0	24.0	100.0	95.2	100.0	14.7

Discussion

Medicine expenditures increased in MUGEFCIs between 2014 and 2018, growing at an average annual rate of 14.67%. This increase was greater than that of Côte d'Ivoire's gross domestic product, which fell from 9.4% in 2014 to 4.8% in 2018 [17].This average annual growth rate for expenditure was also higher than that for the number of users of medicines in the MUGEFCI. This increase affected all age groups and all ATC classes of drugs. Medicine expenditures in several countries are constantly increasing. In 2020, Kim noted that Korea was one of the OECD countries with the highest share of pharmaceutical expenditure [18]. In Africa, few studies on pharmaceutical expenditure are available. In Sudan, Mousnad noted an overall increase of 391.95% in pharmaceutical expenditures from 2006-2010 [19].

Our study revealed that drugs in ATC classes J, C, P and A accounted for the highest expenditure. Mousnad in Sudan reported that 72.89% of National Health Insurance Fund expenditures involved these same classes of drugs. The order of priority of ATC classes in expenditure in his study differed from ours, as he reported that drugs in classes J, A, C and P were the most important. Thus, our two African studies suggest that medicine expenditures are mainly concentrated among anti-infectives (J and P) and drugs for the cardiovascular system and digestive tract (C and A). Anti-infectives for systemic use, mainly bacteria for systemic use, are the drugs that generate the greatest expenditure. They account for expenditures on both adults and children. One-third of expenditures on this class of drugs are for children. This implies that children are highly exposed to these drugs, which may lead us to investigate the rationality of their use. Expenditure on cardiovascular drugs is of interest to active mutualists, generally from the age of 35.

Although they do not account for the bulk of expenditure, anticancer drugs (L) and digestive tract drugs (including drugs used for diabetes) are among the drugs associated with the greatest increases in average annual expenditure. This implies a greater increase in the frequency of use of these drugs in the mutualist population and should increase awareness of the need to prevent related illnesses. Although the structure of medicine expenditures in our study is comparable to that of Mousnad in Sudan, it is completely different from that of developed countries. In Canada, Morgan, between 1996 and 2002, estimated that 75% of medicine expenditures were borne by five ATC groups: 'C', 'N', 'A', 'G' and 'J' [9]. Gerdtham in Sweden reported that the 'N', 'C' and 'A' classes were the costliest [10].

Several authors agree that the elderly (over 65) account for the highest medicine expenditures [20-23]. In our study, medicine expenditures for people over 65 years of age did not appear to account for the largest proportion. In fact, people in this age group account for only 2-3% of drug users. Because of the lower life expectancy, estimated at 59 years in Côte d'Ivoire, it is the younger age groups that account for the bulk of expenditure [17]. In this study, young adults (aged 35-45) accounted for most of the expenditure. This age group is the most economically active. Our study highlights the fact that these individuals are more likely to suffer from health problems. We therefore need to investigate their drug consumption so that corrective action can be taken if necessary.

Conclusion

Overall, medicine expenditures rose significantly from 2014 to 2018 at the MUGEFCI. This increase was noted in all age groups but was more significant among young adults. Anti-infectives, medicines for the cardiovascular system and those for the digestive tract accounted for the highest expenditures. Studying the use of these drugs and the factors behind the increase in expenditure could provide decision-makers with solid arguments to encourage their rational use and control.

Author contributions

YYP and colleagues extracted data from the MUGEFCI database. JK, RA and YYP checked for data quality. JK and KK analysed the data and wrote the first version of the manuscript. RA and SO validated the final version of the manuscript. All the authors agree to be accountable for all aspects of the work.

Conflict of interest

The authors report no conflicts of interest in this work.

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