Health Status and Demographic Characteristics of Patients Attending a Primary Care Unit in Mexico City: A Descriptive Study.

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ABSTRACT

Aims: to understand the Health Statuts and Demographic Characteristics of Patients Attending, in the primary care setting.
Study design: A descriptive and cross-sectional study was conducted.
Place and Duration of Study: Ambulatory Care Medical Unit. The study was conducted from July 1st to October 31st, 2024, with Mexican patients attending the Family Medicine Speciality outpatient consultation at the Family Medicine Clinic "División del Norte", in Mexico City, from January 1st, 2022 to December 31st, 2022.
Methodology: Data on health and sociodemographic variables were collected through a retrospective design, using the Medical Financial Information System "SIMEF system" (Sistema de Información Médico Financiero by its acronym in Spanish).
Results: The population pyramid is characterized by being of regressive type, with a higher proportion of adults over 60 years old and women. The leading causes of medical attention according to the International Classification of Diseases, Tenth Revision (ICD-10) were for non-communicable diseases (NCDs), such as: hypertension, type 2 diabetes, chronic obstructive pulmonary disease, hypothyroidism, and obesity (due to excess calories), and for communicable diseases (CD): COVID-19, acute pharyngitis, urinary tract infection, infectious gastroenteritis and colitis, and acute tonsillitis.
Conclusion: The demographic and clinical characteristics of the patients in this study highlight the complex landscape of distinct temporal trends for each NCDs and CDs. Understanding these trends, evidence-based decisions on resource planning and preventive measures can be improved. Proactively aligning resources with anticipated seasonal peaks, and implementing targeted health campaigns, that can improve patient care and alleviate pressures on healthcare systems during high-demand.

Keywords: Communicable diseases; Epidemiology, Health Status, non-communicable diseases; Primary Health Care.

1. INTRODUCTION

The Mexican health system comprises three main components which were operating in parallel: employment-based social insurance schemes, public assistance services for the uninsured supported by a financial protection scheme, and a private sector [1]. Despite this framework, over 55% of the Mexican population lacks access to employment-based healthcare insurance [2]. Social insurance schemes are managed by highly centralized national institutions, whereas health care services for the uninsured are operated by both state and federal authorities and providers [1]. The two largest social insurance institutions are the Mexican Social Insurance Institute (IMSS, Instituto Mexicano del Seguro Social by its acronym in Spanish) [1], and the State Employee´s Social Security and Social Services Institute (ISSSTE, Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado by its acronym in Spanish). This segmentation contributes to a scenario of vulnerability, compounded by inequalities in access to healthcare [2]. To fully understand health dynamics in Mexico, it is essential to recognise the influence of profound socio-economic, political, and cultural disparities on the healthcare system [2]. These inequities are further exacerbated by pressing challenges, including the rise of non-communicable diseases (NCDs) (e.g., obesity, diabetes, cardiovascular diseases), violence, aging populations, and persistent health inequity [1]. Recognising the inequities in access created by its segmented structure, the government faces significant challenges in integrating service delivery across all public institutions [1]. Health inequities and disparities in access to healthcare represent one of the main developmental challenges for nations and their populations [3]. These disparities are shaped by social determinants of health, such as: housing, education, access to clean water, electricity, transportation, employment opportunities, and cultural services [4]. To address these inequalities requires robust and systematic data to identify their prevalence and impact. This may enable us to determine regions where they are most pronounced and implement targeted actions based on the specific needs of the affected population [3-4]. It is well established that health disparities vary across lifetime. However, it is evident that these social health inequalities, are due to the complex interactions among various health determinants [5]. Mexico has wide regional disparities in health. For instance, 40 million Mexicans live below the poverty line, while approximately 2% of the population is considered wealthy, illustrating a stark inequality gap [6]. A striking example of these disparities is the 17-year difference in life expectancy between a child born in Monterrey City and one born in an Indigenous region of Chihuahua [6]. In Mexico City, despite notable progress in reducing health inequalities, significant challenges remain, including service fragmentation, unequal resource distribution, and limited capacity to address the diverse range of prevalent health issues and causes of death [7].

The complex health landscape, in Mexico City, is shaped by territorial heterogeneity, demographic transitions, segmented structures of the public health system and changing disease, in addition to mortality profiles, leading to uneven social development across its 16 boroughs [7]. Boroughs such as Coyoacán, Azcapotzalco, Benito Juárez, and Miguel Hidalgo have high levels of social development, while Iztapalapa, Tláhuac, Xochimilco, and Milpa Alta are among the least developed [7]. The most significant socio-epidemiological changes impacting the health system include rising structural risks (such as unemployment, precarious employment, wage loss, and deteriorating living conditions), patterns of urban settlement and depopulation with poorer populations which were displaced to the metropolitan outskirts, demographic transitions, and increasingly complex disease and mortality profiles among the urban population [7]. In 2020, the borough of Coyoacán recorded a total ISSSTE-affiliated population of 203,831 beneficiaries, representing the 33.2% of the borough's total population. This figure underscores the significant role ISSSTE plays in delivering healthcare services to a substantial portion of Coyoacán's residents. Of this total, 80,720 beneficiaries (13.1% of the borough's population) were assigned to the División del Norte Family Medicine Clinic (CMF). The clinic's beneficiary population includes federal government employees, their family members, pensioners, and pensioners' family members. These figures highlight ISSSTE's position as one of the principal healthcare providers in Coyoacán, catering to a considerable share of the borough's population through its robust healthcare infrastructure. They also reflect the wider necessity of understanding population characteristics to effectively manage and allocate healthcare resources. In this context, it is essential to recognise the demographic characteristics of specific groups and their social environment to design effective public health policies and strategies [8]. Such insights enable the prioritisation of health issues and the development of targeted interventions in order to enhance overall population health.

1.1 The Aim of the Study.

To establish the sociodemographic, clinical characteristics, and epidemiological profile of the population served in a primary care unit in Mexico City.

2. MATERIAL AND METHODS

2.1 Study design and settings.

A descriptive, cross-sectional study was designed and conducted with Mexican patients attending outpatient consultations in the Family Medicine Specialty and General Medicine departments at the "División del Norte" FMC, ISSSTE, in Mexico City. The aim of the study was to establish the sociodemographic, clinical characteristics, and epidemiological profile of patients across all population groups (including new-borns, children [aged 0 to 9 years old], adolescents, mature adults, and the elderly population). The collection of the data followed a retrospective approach and was sourced from secondary data, from January 2022 to December 2022. The SIMEF system (Sistema de Información Médico Financiero by its acronym in Spanish) was used to gather sociodemographic variables (such as age, sex, outpatient consultations data) and comorbidities. The study was conducted from July 1st to October 31st, 2024.

2.2 Study Population, Data Collection and Instruments.

The study included all subjects (17,918) who attended follow-up appointments in the outpatient clinic of the Family Medicine Speciality and General Medicine Service, the MIDE module, Nutrition, Dentistry, Family Planning, and Gerontology from new-borns to elderly population (from both sexes). The data was collected through the "SIMEF" records. This system captures information on all consultations provided by the medical personnel. Initially, the patients were identified using the “SIMEF” system. Thenceforward, a data collection sheet was employed to gather detailed information such as (patient name, medical record number, date of birth, address, date of outpatient consultations) and sociodemographic factors (sex and age). The working tools used included Excel files generated monthly by the "SIMEF" system. The collected data was stored in an Excel workbook, which served as the statistical database for subsequent analysis. This procedure ensured the extracted data's accuracy, quality, and reliability, supporting the integrity of our study’s findings. Finally, a review of the new combined database was conducted to ensure consistency of the information.

2.3. Statistical analysis.

The categorical variables are described as absolute frequency and percentage, and quantitative variables as mean, standard deviation (SD), and interquartile range (IQR). Confidence Interval 95% (CI95%) was included. Categorical variables were compared using Yates' corrected chi-square (X^2) test and likelihood ratio, as appropriate. Quantitative variables were compared using the Mann-Whitney U test or Student's T test as appropriate. A P value < 0.05 (two-tailed test) was considered significant.

2.4 Ethical Considerations.

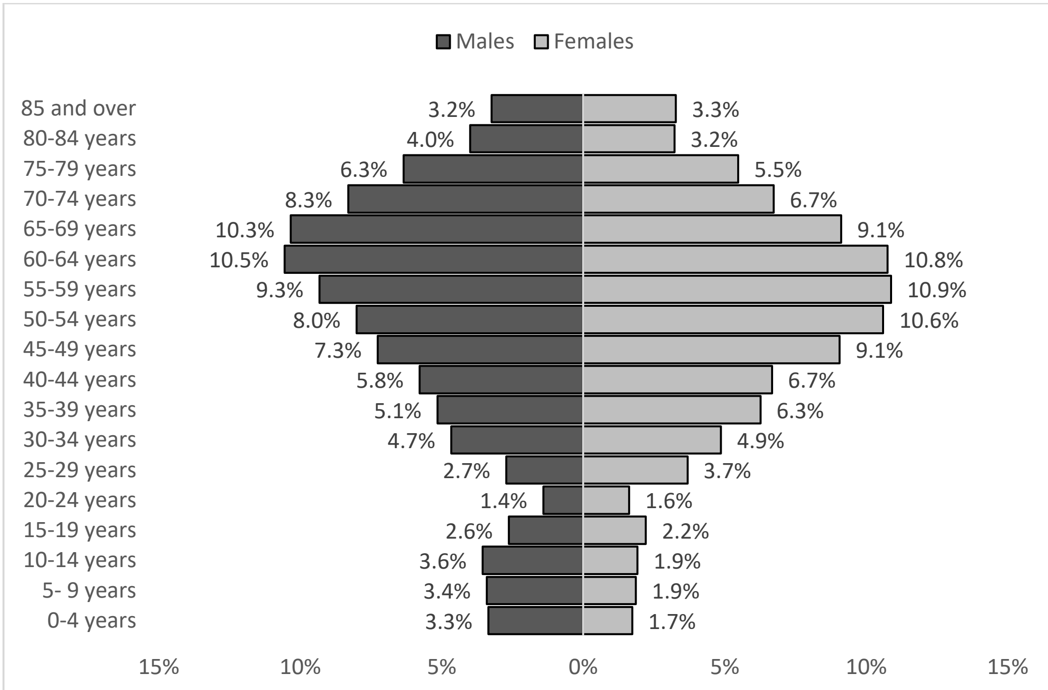
The study was conducted in accordance with the Good Clinical Practice Guidelines of our laws and the Declaration of Helsinki for human experiments. The protocol was approved by two committees: The Research Committee, and the Ethics Committee in Research of the FMC "División del Norte", ISSSTE. All data was handled with strict confidentiality to ensure the privacy and protection of participants' information.

3. RESULTS AND DISCUSSION.

3.1 Sociodemographic component of the study population.

The population pyramid is characterized by a progressive type, with a higher proportion of adults over 60 years of age and women (Figure 1).

Figure 1. Population pyramid, 2022.



Source: Prepared by the authors using data from the Medical Financial System (SIMEF) in 2022.

The 17,918 patients included in the study had an average age of 52.30 years old (SD=20.848), a median age of 55.00 years old (IQR=40-67 years), an age range of 108 years old, with a minimum age of 0 years old (new-borns) and a maximum age of 108 years old. The average age of the patients was similar (p= 0.788, using U Mann-Whitney test). However, the median age was higher in male patients compared to female patients (p=0.005, Median Test between independent groups). Male patients (n=6 629) had an average age of 51.67 years old (SD=22.442), a median age of 56.00 years old (IQR=38-68), an age range of 104 years old, with a minimum age of 0 (new-borns), and a maximum age of 104 years old, while, female patients (11 289) had an average age of 52.67 years old (SD = 19.844), with a median age of 55.00 years old (IQR=40-66.50), an age range of 108 years old, with a minimum age of 0 (new-borns) and a maximum age of 108 years old. In 2022, a total of 73,974 outpatient consultations were granted. The average of consultations was 6,165 (SD=457.9). Females demanded more consultations (p<0.0001) compared to males (n=48,416; 65.5%, CI95% 65.1-65.8 vs. n=25,558; 34.5%, CI95% 34.2-34.9). The average of consultations per month in women (n= 4,035; SD= 354.2) was significantly higher (p<0.001) than in men (n= 2,130; SD= 137.1). In the total population, the months with the lowest and highest demand for outpatient consultations were February and July, respectively (table 1). However, for the female population is June and July, unlike men who attended consultations more frequently in August and October. February was the month with the lowest demand of consultations in both sexes.

Table 1. Comparison of consultation granted by month and sex, in the study population.

Month	Male (n=25,558) f, % (CI95%)	Female (n=48,416) f, % (CI95%)	Total (N=73,974) f, % (CI95%)	P value
January	2028, 7.9 (7.6-8.3)	3578, 7.4 (7.2-7.6)	5606, 7.6 (7.4-7.8)	0.001*
February	1813, 7.1 (6.8-7.4)	3169, 6.5 (6.3-6.8)	4982, 6.7 (6.5-6.9)	
March	2189, 8.6 (8.2-8.9)	4155, 8.6 (8.3-8.8)	6344, 8.6 (8.4-8.8)	
April	2125, 8.3 (8-8.7.0)	4049, 8.4 (8.1-8.6)	6174, 8.3 (8.1-8.5)	
May	2178, 8.5 (8.2-8.9)	4202, 8.7 (8.4-8.9)	6380, 8.6 (8.4-8.8)	
June	2175, 8.5 (8.2-8.8)	4412, 9.1 (8.8-9.4)	6587, 8.9 (8.7-9.1)	
July	2221, 8.7 (8.3-9.1)	4431, 9.2 (8.9-9.4)	6652, 9.0 (8.8-9.2)	
August	2279, 8.9 (8.6-9.3)	4166, 8.6 (8.3-8.9)	6445, 8.7 (8.5-8.9)	
September	2190, 8.6 (8.2-8.9)	4081, 8.4 (8.2-8.7)	6271, 8.5 (8.3-8.7)	
October	2279, 8.9 (8.6-9.3)	4247, 8.8 (8.5-9.0)	6526, 8.8 (8.6-9.0)	
November	1952, 7.6 (7.3-8.0)	3912, 8.1 (7.9-8.3)	5864, 7.9 (7.7-8.1)	
December	2129, 8.3 (8-8.7.0)	4014, 8.3 (8.1-8.5)	6143, 8.3 (8.1-8.5)	

**p-value was calculated using the Chi-square likelihood ratio. Confidence intervals are based on 1000 bootstrap samples. 95%CI: 95% confidence interval. Source: Prepared by the authors using data from the Medical Financial System (SIMEF) for the year 2022.*

Regarding age groups, elderly were the ones who mainly (p< 0.001attended consultations (Table 2). On children, adolescents and elderly population, children (p= 0.042) and men (p<0.001) attended consultations more frequently. Meanwhile, younger adult females (p<0.001) between 20 and 59 years old attended consultations more frequently (Table 2).

Table 2. Comparison of consultation by age group and sex, in the study population.

Ages group	Male (n= 25,558) f, % (IC95%)	Female (n= 48,416) f, % (IC95%)	Total (N= 73,974) f, % (IC95%)	P value
0-9 years	1,024; 4.0 (3.8-4.2)	896, 1.9 (1.7-2.0)	1,920; 2.6 (2.5-2.7)	<0.001*
10-19 years	980; 3.8 (3.6-4.1)	1,011; 2.1 (2.0-2.2)	1,991; 2.7 (2.6-2.8)	
20-59 years	9,855; 38.6 (38.0-39.2)	23,167; 47.8 (47.4-48.3)	33,022; 44.6 (44.3-45.0)	
60 years and above	13,699; 53.6 (53.0-54.2)	23,342; 48.2 (47.8-48.7)	37,041; 50.1 (49.7-50.4)	

**p-value was calculated using the Chi-square likelihood ratio. Confidence intervals are based on 1000 bootstrap samples. 95%CI: 95% confidence interval. Source: Prepared by the authors using data from the Medical Financial System (SIMEF) for the year 2022.*

Furthermore, SIMEF records show that the main type of consultation granted is subsequent (58,550 subsequent consultations; 79.1%, CI95% 78.9-79.4 vs. 15,424 first-time consultations; 20.9%, CI95% 20.6-21.1; p<0.001).

3.2 Epidemiological profile of the study population.

The leading causes of medical attention according to the International Classification of Diseases, Tenth Revision (ICD-10) were: 1) essential (primary) hypertension, 2) type 2 diabetes (T2D), 3) chronic obstructive pulmonary disease (COPD), 4) COVID-19 (virus identified), 5) hypothyroidism, 6) obesity (due to excess calories), 7) hyperlipidaemia, 8) acute pharyngitis, 9) convalescence following surgery, 10) other specified metabolic disorders, 11) (chronic) (peripheral) venous insufficiency, 12) prostatic hyperplasia, 13) unspecified low back pain, 14) depressive episode (unspecified) and 15) obesity (unspecified) (table 3).

Table 3. Main 30 codes of the international classification diseases, revision 10th, in the study population.

Code	Records	Diagnosis
I10.X	16401	Essential (primary) hypertension.
E11.9	14062	Type 2 diabetes mellitus without complications.
J44.9	3312	Chronic obstructive pulmonary disease, unspecified.
U07.1	3127	COVID-19, virus identified.
E03.9	2572	Hypothyroidism, unspecified.
E66.0	2160	Obesity due to excess calories.
E78.5	2120	Hyperlipidaemia, unspecified.
J02.9	1642	Acute pharyngitis, unspecified.
Z54.0	1620	Convalescence following surgery.
E88.8	1611	Other specified metabolic disorders.
I87.2	1527	Venous insufficiency (chronic) (peripheral).
N40.X	1441	Benign prostatic hyperplasia.
M54.5	1429	Low back pain.
F32.9	1417	Major depressive disorder, single episode, unspecified.
E66.9	1331	Obesity, unspecified.
F41.9	1130	Anxiety disorder, unspecified.
H40.9	1109	Unspecified glaucoma.
R73.0	1070	Abnormal glucose.
I25.9	1053	Chronic ischemic heart disease, unspecified.
N39.0	975	Urinary tract infection, site not specified.
E78.2	964	Mixed hyperlipidaemia.
F41.2	935	Mixed anxiety and depressive disorder.
M06.9	909	Rheumatoid arthritis, unspecified.
N18.9	901	Chronic kidney disease, unspecified.
M17.9	832	Osteoarthritis of knee, unspecified.
Z12.4	814	Encounter for screening for malignant neoplasm of cervix.
K58.9	813	Irritable bowel syndrome without diarrhoea.
A09.9	762	Infectious gastroenteritis and colitis, unspecified.
G47.3	756	Sleep apnoea.
M81.9	692	Osteoporosis, unspecified.

Source: Prepared by the authors using data from the Medical Financial System (SIMEF) for the year 2022.

The five main causes of non-communicable chronic diseases were: hypertension, T2D, COPD, hypothyroidism and obesity (due to excess of calories). Regarding hypertension, a total of 4,870 subjects were treated. October was the month with the highest number of patients treated, and January with the lowest number of patients treated. A gradual and constant increase in the number of patients treated is observed from January to May, and a decrease in June. Subsequently, for the second half of the year, alternating increases and decreases are observed, with peaks observed in August, October and December (table 4). A total of 3,643 patients were treated for T2D. Likewise, it is observed a similar temporality to the cases of hypertension. In the first quarter of the year, the care provided increases continues in April. Subsequently, it is observed a decrease in the care provided, and in the months of May, June and July. In the last five months, an increase followed by a decrease in care is alternately observed (table 4).

The COPD was the third cause of care and a total of 576 patients were treated. The largest number of patients treated for COPD was in December and June. June was the month with the lowest number of cares. As with hypertension and T2D care, a constant increase in the number of cases provided is observed in the first three months of the year. However, in April and May, it is observed a decrease and an increase in the number of cases, respectively, and in July, there is a very significant decrease in the number of cases provided. In the second half of the year, it is observed the same temporality, there is an increase in the number of cases provided in July and August, and subsequently, peaks are observed in October and December and decreases in September and November (table 4).

The epidemiological behaviour for the fourth cause of care was different from the first three causes. A total of 1,002 patients with hypothyroidism were treated. In the first five months of the year it is observed a constant and gradual increase in accumulated cases. In June, there is a decrease, and it increases again in July and August. Subsequently, the decrease is observed in September, together with another increase in cases in October and November, culminating with another decrease in December (table 4).

Obesity (due to excess of calories) was the fifth cause of attention in patients with NCDs. The epidemiological behaviour of the accumulated cases of obesity does not correspond to the epidemiological behaviour of the accumulated cases of hypertension and T2D. Two important cases decreases are observed: the first during the period of June to July and the second in the period of November-December. There is also an increase in accumulated cases from January to May, with a plateau in March, April and May, and finally, in August another increase in cases was observed.

Table 4. Comparison of the main non communicable chronic diseases, per month, in the study population.

Month	Records-consultations					Patients treated				
	HTN	T2D	COPD	HT	Obes	HTN	T2D	COPD	HT	Obes
Jan	1133	1075	280	167	83	1085	979	263	159	82
Feb	1296	1133	288	172	191	1216	1045	264	166	185
Mar	1456	1291	310	227	243	1341	1157	283	214	236
Apr	1441	1334	299	227	245	1347	1228	268	215	237
May	1450	1273	307	244	242	1361	1179	282	231	233
Jun	1246	1181	62	205	199	1165	1086	55	199	190
Jul	1319	1119	278	230	180	1235	1020	268	210	172
Aug	1405	1193	284	226	189	1344	1119	271	212	187
Sept	1309	1103	269	201	173	1243	1019	261	194	170
Oct	1603	1255	340	252	175	1474	1132	276	235	170
Nov	1310	1029	217	219	123	1257	967	208	210	120
Dec	1433	1076	378	202	117	1296	979	276	189	115

Source: Prepared by the authors using data from the Medical Financial System (SIMEF) for the year 2022. HTN= hypertension, T2D= type 2 diabetes, COPD= chronic obstructive pulmonary disease, HT= hypothyroidism, Obes= obesity.

Regarding the proportion of the first five non-communicable diseases, by sex, we can observe that attention is directed mainly to women (p<0.001) (table 5).

Table 5. Comparison of the proportion of the main non communicable chronic diseases, per sex.

Sex	HTN (n=16,401)*	T2D (n=14,062)*	COPD (n=3,312)*	HT (n=2,572)*	Obes (n=2,160)*

	f, % (CI95%)	f, % (CI95%)	f, % (CI95%)	f, % (CI95%)	f, % (CI95%)
Male	6363, 38.8 (38.1-39.5)	5737, 40.8 (40-41.6)	1182, 35.7 (34.1-37.3)	315, 12.2 (11-13.5)	653, 30.2 (28.3-32.2)
Female	10038, 61.2 (60.5-61.9)	8325, 59.2 (58.4-60)	2130, 64.3 (62.7-65.9)	2257, 87.8 (86.5-89)	1507, 69.8 (67.8-71.7)

Source: Prepared by the authors using data from the Medical Financial System (SIMEF) for the year 2022. HTN= hypertension, T2D= type 2 diabetes, COPD= chronic obstructive pulmonary disease, HT= hypothyroidism, Obes= obesity.

Regarding to transmissible diseases,the main illnesses were: COVID-19, acute pharyngitis, urinary tract infection, infectious gastroenteritis and colitis, and acute tonsillitis. The main causes of care are related to respiratory diseases. COVID-19 (ICD-10 code U07.1) was the fourth cause of care in the Unit and the first cause of care for communicable diseases (CD). A total of 2,847 subjects were treated. The peaks of care for COVID-19 were in the months of January and July, and the months of least care were April and October (table 6). Similarly, a total of 1,598 subjects were treated for acute pharyngitis. The number of cases increased mainly in two periods (gradually and steadily): the first period from April to June and the second period from September to December. In the first quarter of the year, a steady decrease in cases was observed. In the same way, at the beginning of the second half of the year, in the months of July and August, the number of accumulated cases decreased (table 6).

Regarding to cases of urinary tract infections, in the first four months of the year, cases increase (from January to April), and remain stable in May, decrease in June and July, and increase again in August, finally they decrease from September to December. For cases of colitis and gastroenteritis of presumed infectious origin, peaks are observed in the months of January, March, May, June, August and November, compared to the corresponding previous months that presented a lower number of cases (February, April, October and December), excluding the months of July and September. The accumulated cases of acute tonsillitis show a very different epidemiological pattern. In January, more cases were reported than in February. Then in March, April and May it was observed a constant increase in cases, a decrease in June and July, it increased again in August, decreased in September and increased again in October; in November and December, the highest number of cases was recorded, although, in December there were fewer cases compared to November (table 6).

Table 6. Comparison of the main communicable diseases, per month, in the study population.

Month	Records-consultations					Patients treated				
	COVID	AP	UTI	IGC	AT	COVID	AP	UTI	IGC	AT
Jan	918	87	52	47	8	860	85	52	45	8
Feb	217	60	72	38	5	206	60	69	38	5
Mar	35	44	88	89	16	33	44	86	89	16
Apr	11	95	95	74	26	11	89	93	69	26
May	44	104	94	94	41	43	102	92	91	41
Jun	508	185	77	99	30	492	180	75	94	29
Jul	917	119	66	44	15	897	116	65	41	15
Aug	179	71	106	63	22	170	68	104	57	22
Sept	27	135	90	60	10	25	128	87	58	10
Oct	15	228	89	57	25	15	223	83	54	22
Nov	33	247	83	65	65	32	242	81	64	61

Dec	223	267	63	32	50	216	261	62	32	50

Source: Prepared by the authors using data from the Medical Financial System (SIMEF) for the year 2022. COVID= COVID-19, AP= acute pharyngitis, UTI= urinary tract infection, IGC= infectious gastroenteritis and colitis, AT= acute tonsillitis.

3.3 Discussion.

The essential functions of public health include monitoring, evaluation, and analysis of population health trends. Health service coverage can be assessed from multiple perspectives [9]. On the one hand, there is "financial coverage," which concerns the population’s ability to access care according to their payment ability [9]. And on the other hand, coverage can be analysed in terms of service utilisation and availability, which relates the quantity and type of healthcare services to population size, measuring actual service usage based on geographic availability and accessibility [9]. In this context, health coverage is fundamentally a function of population size [9]. Within its sphere of influence, the FMC "División del Norte" covers over 100 neighbourhoods. This represents approximately the 13% of the population in the Coyoacán borough of Mexico City. Additionally, our data allowed us to determine that elderly and females are the main populations that demand outpatient services. Globally, there is an observed epidemiological shift within the elderly population, which presents a significant challenge for society and healthcare systems in terms of medical care provision, particularly regarding to budget allocation for health services [10]. These services must adapt appropriately to an aging population [10]. This shift also creates challenges in designing and developing new public policies based on factors associated with each country’s population [10]. In recent decades, numerous policies and initiatives have been developed to strengthen health systems at local, national, regional, and global levels [9]. Although the World Health Organization (WHO) proposes general action strategies to achieve active aging, where public policy plans must be based on the sociodemographic characteristics of each population [10-11]. To achieve this, it is important to know the population dynamics, which is a fundamental demographic measure to adopt key policies, based on real data. Thus they generate systemic changes, achieving active and healthy aging, and resulting in a comprehensive public health response [10]. Globally, there is an accelerated increase in the elderly population [10-11]. Estimates suggest that by 2050, the proportion of elderly people will double compared to the population recorded in 2000, rising from 11% to 22% [11]. In the Americas and the Caribbean, it is estimated that this demographic will represent the17% by 2030 [11]. This demographic shift is expected to be faster and more intense in low- and middle-income countries (LMIC) [10-11]. Moreover, the number of subjects aged 80 and over projected to reach 395 million by 2050 [11]. In Mexico, elderly people aged 60 and over account for 10.4% of the national population, where Mexico City has the highest proportion of elderly individuals at 11.3% (higher to national proportion) [11]. In addition, elderly people attended within the ISSSTE represent the 19.7% of the population (nearly double the national figure and significantly higher than the estimated 2030 figure for the Americas and the Caribbean) [11]. Our findings show that our population is 2 and 2.4 times over the national attended elderly people within ISSSTE and for region of the Americas and the Caribbean population, respectively. Even, it is 3.9 times higher to the national Mexican population. Aging presents a substantial social and governance challenge in terms of medical care, budget allocation, healthcare services, public policy, and the design of inclusive programmes [10-11]. Coupled with the epidemiological transition, the rise in chronic illnesses and their consequences affect the quality of life of elderly individuals throughout their lives [10-11]. All countries around the world have been going through an important demographic transition: from young to increasingly aging populations [12]. This distribution between young and elderly (dependent) populations is important for the economic and social functioning of countries [12]. “In the United States, under-5s were already outnumbered by those older than 64 in the 1960s. In Spain it occurred at around the year of 1970, while in South Korea, it occurred approximately in 2000.” [12]. For many countries, this crossover point is still to come. In South Africa, it's expected to happen around the year of

2035 [12]. In the Americas and the Caribbean, the situation of elderly individuals is diverse, and their quality of life depends on income, health, autonomy, intergenerational integration, and the infrastructure and health conditions provided by each country for its citizens, which do not always ensure quality [11]. Life quality is a crucial issue that affects individuals, families, and society as a whole. This concept is gaining renewed relevance in relation to aging, highlighting the need to support elderly individuals to maximise their health, functional capacity, and security [11]. NCDs represent the world's leading cause of death and the 86% of premature deaths (before age 70) occur in LMIC [13]. People of all age groups, regions and countries are affected by NCDs, but are often associated with elderly people [13]. Evidence shows that 17 million NCDs deaths occur before the age of 70. According to the WHO, the main types of NCDs are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as COPD and asthma) and diabetes. Some of our data are on line with WHO facts. Two of the five main NCDs are similar. Hypertension and T2D represent the largest share of patients receiving care, with seasonal variations that may reflect broader environmental, behavioural, or healthcare access factors. The peaks observed in October and December could be discussed regarding to seasonal health factors, possible holiday-related dietary changes, or healthcare access issues that impact patient behaviour at specific times of the year. Additionally, the fewer patients attending in January might suggest a seasonal lull, possibly due to holiday closures or a decline in patients' adherence to treatment.

Globally, the increase in the burden of NCDs, including hypertension, has been larger in LMICs compared to high-income countries. [14-16] An estimate of 1.28 billion adults aged 30–79 worldwide have hypertension and approximately two-thirds are living in LMICs [14-16]. The prevalence has increased in both urban and rural areas, especially in LMICs (with a stronger trend in the last one) and varies across regions and country income groups [14-16]. "The WHO African Region has the highest prevalence of hypertension (27%) while the WHO Region of the Americas has the lowest prevalence of hypertension (18%)" [14]. Several risk factors may explain some of the regional heterogeneity in hypertension prevalence, such as sex, age, education, race, high sodium intake, low potassium intake, obesity, alcohol consumption, physical inactivity and unhealthy diet [15-17]. Moreover, hypertension is the leading preventable risk factor for cardiovascular disease (CVD), all-cause mortality, and disability worldwide [15-16]. Even, the coexistence of T2D and hypertension confers a dramatically increased risk (2- to 4-fold) of CVD, end-stage kidney disease, and death, compared with the normotensive and nondiabetic adults [18]. Similarly, T2D is a complex, chronic condition requiring continuous medical care with multifactorial risk-reduction strategies beyond glucose management [19]. Ongoing diabetes self-management education and support are critical to empower people, preventing acute complications, and reducing the risk of long-term complications [19]. Significant evidence supports a range of interventions to improve diabetes outcomes [19]. These disparities suggest that healthcare systems in LMICs could be facing a rapidly increasing burden of NCDs, and in some cases, a substantial burden of infectious diseases, and a combination with respiratory illness such as COPD [15]. This trend is on line with our findings. COPD is a progressive respiratory condition with significant complications, including increased CV risk, respiratory failure, and lung cancer [20] It imposes an increasing burden on society through both direct and indirect costs. [20]. In the European Union, respiratory diseases account for an estimated of 6% of the total annual healthcare expenditure, with COPD representing the 56% (€38.6 billion) of these costs [20]. In the United States, the annual economic burden of COPD is approaching $40 billion [20]. The most significant components of the total COPD cost are hospitalisation, follow-up through outpatient care, and medications used to manage the disease, particularly for patients requiring long-term oxygen therapy [21-23]. In Mexico, the annual direct medical costs for treating patients with moderate and severe COPD, are approximately $1,150 and $2,320, respectively [21]. The prevalence of COPD also varies by region and population [20]. In 2020, the global prevalence of COPD was 10.6% [20]. However, in Latin America and the Caribbean population, the prevalence was 8.9% [24]. The projected COPD prevalence by 2050 is 15.1% for sub-Saharan Africa (projected to become the most prevalent region) [20]. The second and third projected regions, by the same year, are East Asia and Pacific as well as South Asia, respectively. In our study population, the variations in patient numbers for COPD show a distinct pattern, with peak cases in December and a significant dip in June, possibly associated with seasonal environmental factors such as: pollution levels or respiratory infection rates. These fluctuations might indicate a need for targeted interventions during specific times of the year to manage exacerbations in these patients, such as: enhanced respiratory support services in winter. For hypothyroidism and obesity, which present different seasonal trends, the data might suggest more complex or indirect relationships with lifestyle factors, healthcare access, or even variations in medication compliance. The peaks and troughs for hypothyroidism and obesity indicate a need for targeted patient support programmes that account for these cyclical patterns, particularly around dietary habits (it is recommended to promote foods rich in omega-3, antioxidants, iodine, selenium, zinc, and vitamin D to support healthy thyroid hormone production, however, seaweed should be avoided due to its excessive iodine content, which could disrupt thyroid function) and physical activity that could impact metabolic control. The prevalence rate of primary hypothyroidism in the general population varies from 0% to 8% in population of the USA and from 0% to 7% in European population, similar to our data [25]. Moreover, the prevalence of overweight varied by region, from 31% in the WHO Southeast Asia Region and the African Region (similar to our data) to 67% in the Americas Region [26].

Regarding to a communicable disease, COVID-19 remains a prominent cause of care demand, with notable peaks in January and July, suggesting a potential seasonal or environmental influence, such as: colder weather or increased indoor gatherings. These data are similar to data report by Li Y et al., who sowed that the human seasonal coronaviruses (sCoVs) were prevalent during the winter months in most temperate sites excluding China [27]. However, in China and in tropical sites the sCoVs tended to be less seasonal [27]. In temperate sites, the 53.1% of annual sCoV cases (interquartile range [IQR], 34.6%–61.9%) occurred during the influenza season [27]. We identified seasonal spikes in COVID-19 from December through February, similar to data reported by Wiemken TL et al, who showed seasonal pikes from November to April, for USA and Europe [28]. Our data (consistent with findings in other populations), support the implementation of annual preventive measures against SARS-CoV-2, such as administering seasonal booster vaccines [28]. These vaccines may be available in a similar timeframe as those in place for influenza [28]. This pattern highlights the need for flexible resource allocation and possibly intensified public health campaigns during these peak times. Further investigation into the associated factors to these seasonal peaks could help inform targeted preventive measures and optimise healthcare delivery during high-demand periods. The second most common communicable disease, acute pharyngitis, shows a different seasonal pattern, with increased cases in spring (suggesting bacterial pharyngitis) [29] and late autumn (suggesting enteroviral infections), potentially linked to seasonal changes or specific environmental factors, such as pollen or humidity. The clear reduction in cases during the mid-summer months suggests that respiratory pathogens associated with pharyngitis may spread less effectively during warmer weather, aligning with seasonal respiratory illness patterns observed in similar settings. However, our findings differ from those reported by Kennis M et al., who observed a distinct seasonal trend, with the average incidence of Group A Streptococcus pharyngitis peaking in winter and declining during the summer [30]. The UTIs show a distinct temporal pattern, with increased cases in the first half of the year and another peak in August, possibly reflecting variations in hydration levels, lifestyle changes, or even healthcare-seeking behaviour. Urinary tract infections (UTIs) are more common in the summer and early fall than other times of the year [31]. However, we observed a peak in spring (different to the literature reports). This is due to warmer temperatures, which increase the risk of UTIs in many ways. These trends could guide public health recommendations around UTI prevention, such as hydration reminders during high-incidence months. Infectious gastroenteritis and colitis exhibit peaks that do not fully align with other diseases, showing sporadic spikes in months such as January, May, and August. This pattern suggests multiple influencing factors, including seasonal dietary habits, water quality, or food safety incidents, which may increase vulnerability during specific times. Viral gastroenteritis is more frequent in cool seasons (November through April), and sporadic occurrence in year-round [32-33]. However, in our study population was more frequent in spring. Tailoring public health interventions to these peaks might reduce incidence, particularly through educational initiatives on hygiene and food safety. Finally, the epidemiological pattern of acute tonsillitis, with consistent increases in late autumn and early winter, indicates a heightened need for respiratory infection control measures, such as public health messaging on hygiene and vaccination, in order to prevent spread during high-incidence periods. Tonsillitis is more common in winter and early spring, but it can occur at any time during the year [34]. However, in our study population, the highest peak was et the end of autumn.

To understand these epidemiological behaviours provides an opportunity to examine resource allocation within healthcare systems, particularly for outpatient and preventive care. The different temporal patterns across these conditions could inform the development of targeted public health campaigns, such as seasonal health advisories, lifestyle modification support, and enhanced chronic disease management strategies during peak periods. This evidence-based approach could enhance patient outcomes and optimise healthcare delivery by aligning resources more effectively with seasonal demand patterns.

3.4 Limitations and applications.

Descriptive and cross-sectional studies are used to provide a systematic description of a situation and cannot be used to establish cause and effect relationships. Understanding these epidemiological patterns enables healthcare systems to optimise resource allocation, particularly for outpatient and preventive care. Seasonal variations across conditions highlight the need for targeted public health interventions, such as: seasonal health campaigns to address peaks in communicable diseases, lifestyle modification support for managing chronic conditions, enhanced disease management strategies for COPD, hypertension, and T2D during high-demand periods.

This evidence-based approach can improve patient outcomes and healthcare delivery by aligning resources more effectively with temporal patterns of demand, contributing to a more resilient public health system.

The disparity between the number of female participants (n=11,289) and male participants (n=6,629) does not affect the validity or the results of the study, as this is a descriptive study. The primary objective of descriptive studies is to provide an accurate representation of the characteristics and behaviour of the entire population that has been studied. This includes reflecting any inherent gender distribution within the population.

Rather than introducing bias, the unequal gender distribution observed in this study is an important finding in itself, offering insights into demographic patterns or potential healthcare-seeking behaviours that are relevant to the population under investigation. Therefore, the results remain valid, as they are based on the actual composition of the study population.

4. CONCLUSION.

The study highlights the need for targeted interventions to improve management in primary care settings. The demographic and clinical characteristics of the patients in this study highlight the complex landscape of distinct temporal trends for each NCDs and CDs. Understanding these trends can improve evidence-based decisions on resource planning and preventive measures. Proactively aligning resources with anticipated seasonal peaks and implementing targeted health campaigns can improve patient care and alleviate pressures on healthcare systems during high-demand periods.

DISCLAIMER.

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT.

A medical professional informed all participants about the study's objective, its benefits, and potential adverse events. After providing a clear explanation, the collection of the signatures of those who voluntarily decided to participate in the study, ensuring that participants had sufficient time to read and sign the corresponding informed consent form.

ETHICAL APPROVAL.

This study was conducted in accordance with good clinical practices as defined by Mexican legislation and the Declaration of Helsinki for research involving human subjects. The protocol was approved by two committees: The Research Committee and the Ethics Committee in Research of the Family Medicine Clinic "División del Norte", ISSSTE. The Data was treated confidentially.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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