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Sick leave prescriptions in general medicine: results from the ECOGEN study

Cyril Bègue[1,2,3*], Matthieu Peurois[1,2], Charlotte Orvain[1], Yves Roquelaure[4], Audrey Petit[4] and Aline Ramond-Roquin[1,2]

Abstract

Background Sick leave is a significant social and economic concern, with substantial costs and potential adverse consequences for patients. Understanding the factors influencing sick leave prescriptions is essential to improve their relevance and impact. The principal objective of this study was to describe general medicine consultations that led to sick leave prescriptions.

Methods The ECOGEN study, conducted from November 2011 to April 2012 in France, systematically analysed thousands of general medicine consultations. Data collected from 10,271 consultations, involving non-retired patients aged 18 to 65, provided insights into the determinants of sick leave prescriptions. Various patient and General Practitioners (GP) characteristics, consultation details, and health issues were considered.

Results 16.5% of the consultations analysed, resulted in sick leave prescriptions. Several determinants were identified. Older patients received fewer sick leave prescriptions. Laborers had higher prescription rates, reflecting their poorer health and harsh working conditions. Longer consultations were associated with lower prescription rates. Sick leave prescriptions varied by health issue, with higher rates for musculoskeletal, digestive, respiratory, social, and psychiatric problems.

Conclusion Understanding the determinants of sick leave prescriptions is essential for their appropriate use. This study reveals the intricate interplay of patient characteristics, health issues, and GP factors in these decisions. Despite the fact that the study was not specifically designed to study the prescription of sick leave and that the data relate to a relatively short period, the winter of 2011–2012, it provides important insights into the prescription of sick leave. Improved comprehension can enhance the relevance and effectiveness of sick leave prescriptions, benefiting both individuals and society. Further qualitative research is necessary to explore the underlying factors driving these decisions in greater detail.

Trial registration Not applicable.

Keywords Primary care, Sick leave, General practice, Referral, Health care organisation

*Correspondence:
Cyril Bègue
cyril.begue@univ-angers.fr
[1]Département de médecine générale, Univ Angers, Angers F-49000, France
[2]Univ Angers, POPS, SFR ICAT, Angers F-49000, France
[3]Univ Angers, Univ Rennes, EHESP, Irset (Institut de recherche en santé, SFR ICAT, Inserm, Angers UMR_S 1085, F-49000, France
[4]Univ Angers, CHU Angers, Univ Rennes, EHESP, Irset (Institut de recherche en santé, SFR ICAT, Inserm, Angers UMR_S 1085, F-49000, France

Introduction

Sick leave from work is a major challenge, both collectively and individually. Indeed, it entails substantial societal costs, both direct and indirect. Thus sick leave for ordinary illnesses amounted to 9,7 billion euros in 2022 [1]. Sick leaves are the subject of regular societal debate, with evident resolve on the part of the authorities involved to control the expenses generated, and therefore their prescription. For patients, while sick leave is an important component of therapeutic care, it is not without negative consequences when leave is prolonged, because, aside the loss of income, it can lead to social isolation, and even to a risk of professional exclusion [2].

To improve the relevance of the use of sick leave prescriptions, both on an individual level (risk/benefit balance for the patient), and on the collective level (societal costs, absenteeism), there is a need to understand and apprehend them more fully [3].

The conditions for obtaining and being prescribed sick leave from work vary across countries. For instance, in Portugal, sick leave from work can be prescribed by the employee him or herself, with certain limits in terms of duration and repetition through the year. But most often, it is a medical decision [4, 5].

In France, all physicians, including dentists and midwives, can prescribe sick leave. However, general practitioners remain the first prescribers, since 75% of sick leaves from work in 2002 were prescribed by General Practitioners (GP) [6].

Prescribing sick leave from work is a decision that can be complex. It is the result of an assessment of the physical and psychological functional abilities that are required for carrying out a given professional activity, and an assessment of the impact of work on health, whether positive or negative. It is not merely a matter of removing patients from their professional surroundings, but of integrating their sick leave into a therapeutic project, elaborated conjointly with the patient. In reality, sick leave prescriptions result from a two-stage process: the first is based on a resort to care, which is on the patient's initiative, while the second is based on the decision to prescribe, which stems from the global medical examination. The existing data on the subject is essentially drawn from the French medical health cover data and does not enable us to apprehend the clinical context or to distinguish what originates from the patient's request and what derives from the physician's decision to prescribe. It therefore seems necessary to study sick leave prescriptions on the scale of the consultation, particularly in primary care, establishing links with the clinical data from these consultations. Indeed, if certain decisional factors and certain difficulties encountered by practitioners on this subject have already been described, particularly in qualitative studies [7], we sorely lack more global data on the frequency, the determinants and the clinical context of sick leave prescriptions on a national scale.

ECOGEN (Eléments de COnsultation en medicine GENérale) was a French national descriptive study conducted in 2011, aiming to observe and analyse systematically thousands of general medicine consultations. Despite its relatively long existence, there is no equivalent data today that is more recent and able to offer the opportunity to study sick leave prescriptions in general medicine in France.

The principal objective of this study was to describe general medicine consultations that led to sick leave prescriptions, in terms of patient and prescriber socio-demographic characteristics and reasons for consultation.

Method

A secondary analysis performed on the ECOGEN database.

The ECOGEN study

ECOGEN was a French national multicentre cross-sectional descriptive study, conducted on the initiative of the French Collège National des Généralistes Enseignants, (CGNE) (general medicine teaching) from 28/11/2011 to 30/04/2012. The ECOGEN project aimed to describe the content of general medicine consultations.

This study was conducted on 128 general medicine surgeries with 54 interns (with each internship spread across several surgeries), from 27 Faculties of Medicine in France. The interns, who acted as observers for the study, were trained in observing and collecting data in a 2-day centralised seminar. They observed their Internship Supervisor's (IS) consultations, filling in a standardised observation grid in real time, after which they loaded the data onto a centralised database accessible online.

Data collection

The first part of data collection concerned the characteristics of the practitioner under observation, i.e. gender, location of the practice, conventional sector and mode of practice.

The interns then systematically collected data for all consultations one day a week using a standardised form. Data in the form included patient characteristics (age, gender, profession, social status), the characteristics of the consultations (duration, location) and their content in terms of reasons for consultation (RfC) as reported by the patients, Consultation Results (CR) corresponding to the GPs' conclusions, Care Procedures (CP) corresponding to actions conducted or planned by the GP during consultation. Data collection concerning RfC, CR and CP was carried out using the second version of the international classification in primary care (ICPC-2), designed by the World Organisation of national Colleges,

Academies and Academic Associations of General Practitioners/Family Physicians (WONCA).

Figure 1 shows the structuring of the data on consultation content in the ECOGEN project [8].

The data from the ECOGEN project presents a hierarchical structure (the procedure level is included in the consultation result level, which is itself included in the consultation level) and can be analysed on the scale of each of these levels.

Selection of the consultations used in this study

In order to include only consultations concerning patients in the population of working age, observations relating to patients aged 18 to 65 were selected, and those concerning retirees were excluded.

Identification of the consultations with sick leave prescriptions

ICPC-2 does not provide a specific coding for sick leave prescriptions, which would allow an immediate identification. Keywords and abbreviations "SL, leave, work, illness/sick, absence, professional, accident, prolongation, part-time and time" were therefore extracted from the verbatim to identify the procedures corresponding to sick leave from work. By also using the occupational status (work-related injury or work-related illness), two categories for sick leave were distinguished: ordinary sick leave and work-related injury or illness.

Three levels of analysis of the database were mobilised:

- The procedures, where each line corresponds to a procedure, associated with a consultation result. For each procedure, we thus knew whether or not it

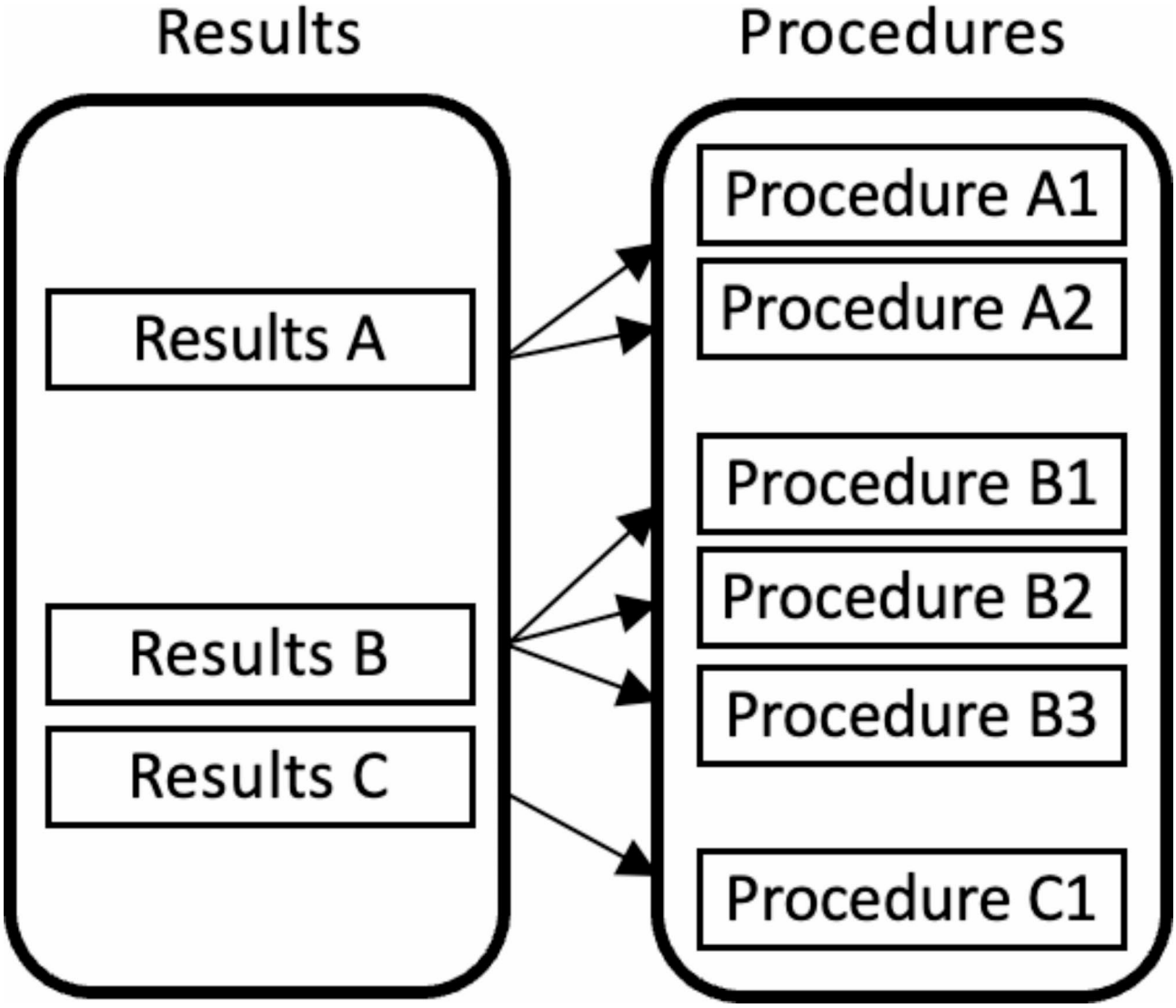

Fig. 1 Diagram for the structuring of a consultation in the ECOGEN project

corresponded to a sick leave from work (ordinary or work-related injury or illness).

- The consultation results, where each line corresponds to a consultation result associated with one or several procedures. If one of the procedures at least corresponded to a sick leave from work, the corresponding result would then be considered as associated with a sick leave from work.
- The consultations, where each line corresponds to a consultation including one or more results, associated with one or several procedures, if one of these procedures at least corresponded to a sick leave from work, the consultation was then associated with a sick leave from work.

Table 1 Characteristics of the study population

Patient gender (*n* = 10271)	*n*	%
Male	4071	39,6
Female	6200	60,4
Patient age (*n* = 10271)		
< 35 years old	3356	32,7
35–50 years old	3774	36,7
> 50 years old	3141	30,6
Patient profession (*n* = 10264)		
Employees	3968	38,7
Farmers	72	0,7
Self-employed workers	552	5,4
Executives	1023	10,0
Labourers	799	7,8
Intermediate professions	1230	12,0
Unemployed	2620	25,5
Duration of consultation (*n* = 10271)		
< 16 min	5621	54,7
≥ 16 min	4650	45,3
Gender IS (*n* = 10271)		
Male	6524	63,5
Female	3747	36,5
Age IS (*n* = 10271)		
< 50 years old	2641	25,7
≥ 50 years old	7630	74,3
Mode of practice (*n* = 10271)		
Alone	2117	20,6
Healthcare centre	136	1,3
Group practice	6065	59,0
Multi professional	1953	19,0
Location of the practice (*n* = 10271)		
Rural	1722	16,8
Semi-rural	2513	24,5
Urban	6036	58,8
Volume of consultations (*n* = 10271)		
< 5000	5098	49,6
≥ 5000	5173	50,4

Statistical analyses

First of all, the study population descriptive analyses were conducted for the patient characteristics (gender, age, and profession), the GP characteristics (gender, age, mode of practice, and annual volume of consultations) and the consultations (duration).

Logistic regressions aiming to model the probability of prescription of a sick leave (binary variable to be explained) were then performed. The first regression models were conducted on the level of consultations, with sick leave prescription as the variable to be explained, and the patients' age, gender and profession, the duration of consultation, the GPs' gender, age, mode of practice, location of the practice and volume of consultations as potential explicative variables, first of all using univariate models, followed by multivariate models, taking patient gender, age and profession into account.

Concerning results from the consultations, descriptive statistics were performed for the body-related domains; the same applied for results from the consultations accounting for 50% of the numbers in each body-related domain, as well as results from the consultations with a percentage of sick leaves exceeding 50%. The distribution of domains of the consultation results was analysed using a chi-squared test.

The statistical significance threshold retained was 5%.

Results

The ECOGEN database included 20 613 consultations. After excluding the under 18-year-olds, the over-65-year-olds and the retirees, 10 271 consultations remained for the study.

In this population, 60.4% of the patients were women, 36.7% were aged between 35 and 50, and 38.7% were employed (Table 1).

It can be noted that among the 2 620 unemployed patients, 467 were students. Once the retirees had been excluded from the analysis, the other 2 153 patients with no employment were in different situations (jobseekers, unemployed by choice, disabled, etc.), and some of them were already on sick leave from work.

Concerning the GP profiles, 63.5% of the consultations were carried out by male GPs, 74.3% by GPs aged 50 or over, in a group surgery for 59% and in suburban areas for 58.8%. The mean number of consultation results was 1.94 per consultation and 54.7% of the consultations lasted less than 16 min.

Among the 10 271 consultations analysed, 1 693 led to a sick leave prescription, with a mean percentage of sick leave per consultation of 16.5%. Among the sick leaves prescribed, 1 520 were in a context of ordinary illnesses and 173 were for work-related injury or illness.

Concerning the consultation results, among the 19 775 consultation results, 1 715 were associated with a sick

leave, i.e. a mean percentage of sick leaves per consultation result of 8.7% (Fig. 2).

Table 2 presents the level of sick leave prescriptions per consultation according to patient and GP characteristics, in univariate and multivariate analyses.

According to the univariate analyses, the levels of sick leave were significantly lower among female patients than among male patients (15.9% *versus* 17.4%, OR = 0.89 [0.66–0.87], $p < 0.001$), and among executives than among employees (14.8% *versus* 24%, OR = 0.55 [0.45–0.66], $p < 0.001$).

The levels of sick leave prescription were significantly lower when consultations lasted less than 16 min (15,5% *versus* 17,3%, OR = 0,87 [0,79 – 0,97], $p = 0{,}011$), and lower in healthcare centres than in single practice (9% *versus* 16,1%, OR = 0,37 [0,19 – 0,74], $p = 0{,}005$), but they did not differ across other modes of practice, the location of the practice or the volume of consultations.

According to the multivariate model, sick leaves were less frequent among the 25–50 year-olds ($_{adj}$OR=0,80 [0,71 – 0,91], $p = 0{,}001$) and the over 50-year-olds ($_{adj}$OR=0,63 [0,55 – 0,73], $p < 0{,}001$) compared to the under 35-year-olds. Sick leaves were also slightly more frequent among labourers, but not significantly so.

Concerning the analyses per domain of consultation results, the levels of sick leave were significantly different ($p < 0.001$) from the mean of 8.7% according to the domain of the ICPC classification concerned (Tables 3 and 4).

The highest levels of sick leave prescriptions concerned the locomotive (17%), digestive (15%), respiratory (14%), social (14%) and psychological (11%) domains. In these domains, dorso-lumbar syndromes (31% and 25%, respectively), gastro-intestinal infections (41%) and gastroenteritis of presumed infectious origin (46%), influenza (53%), the loss of a parent (31%), problems at work (32%), and depression (20%) accounted for particularly high levels of sick leave prescription.

The lowest levels of sick leave concerned the following domains: the endocrine system (1%), general (2%), haematological (3%), cardiovascular (3%), dermatological (3%), urological (4%) and ophthalmological (4%). In these domains however, certain consultation results registered relatively high levels of sick leave prescription, for instance vertigo (22%), cuts (20%), pyelonephritis (25%), and genital diseases (31%).

Discussion

Main results

A sick leave was prescribed in 16.5% of the consultations among non-retired patients aged 18 to 65. The frequency of sick leave prescriptions varied according to the patient's age, socio-professional category, the duration of consultation, and the GP's mode of practice. It also varied according to the health problem concerned, particularly so for locomotive function, the digestive and respiratory tract, and social issues.

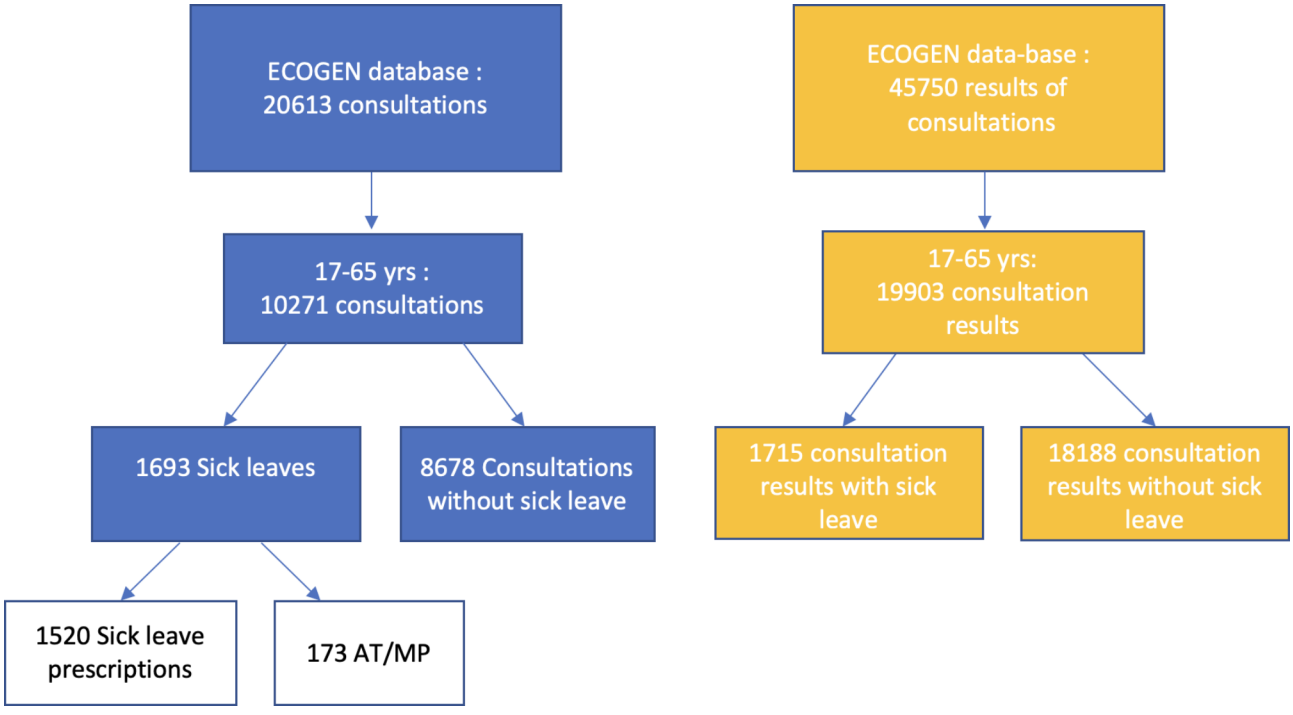

Fig. 2 : Study flowchart

Table 2 Levels of sick leave prescriptions according to patient, GP and consultation characteristics

	No sick leave	Sick leave*	Percentage of sick leaves	Univariate logistic regression		Multivariate logistic regression	
	n = 8578	*n* = 1693		OR	*p*-value	OR	*p*-value
Gender							
Male	3362	709	17,4	-	-	-	-
Female	5216	984	15,9	0.89 (0.80–0.99)	**0.039**	0.92 (0.82–1.03)	0.158
Age							
< 35 years old	2780	576	17,2	-	-	-	-
35–50 years old	3085	689	18,3	1.08 (0.95–1.22)	0.228	0.80 (0.71–0.91)	**0.001**
> 50 years old	2713	428	13,6	0.76 (0.66–0.87)	**< 0.001**	0.63 (0.55–0.73)	**< 0.001**
Profession (7 missing)							
Employees	3015	953	24,0	-	-	-	-
Farmers	71	1	1,4	0.04 (0.01–0.32)	**0.002**	0.05 (0.00–0.22)	**0.003**
Skilled workers	503	49	8,9	0.31 (0.23–0.42)	**< 0.001**	0.31 (0.23–0.42)	**< 0.001**
Executives	872	151	14,8	0.55 (0.45–0.66)	**< 0.001**	0.55 (0.45–0.66)	**< 0.001**
Labourers	576	223	27,9	1.22 (1.03–1.45)	**0.020**	1.19 (1.00–1.43)	0.054
Intermediary profession	974	256	20,8	0.83 (0.71–0.97)	**0.020**	0.83 (0.71–0.97)	**0.018**
Unemployed	2560	60	2,3	0.07 (0.06–0.10)	**< 0.001**	0.07 (0.05–0.09)	**< 0.001**
Duration of consultation							
< 16 min	4647	974	17,3	-	-		
>=16 min	3931	719	15,5	0.87 (0.79–0.97)	**0.011**		
Internship supervisors' gender							
Male	5422	1102	16,9	-	-		
Female	3156	591	15,8	0.92 (0.83–1.03)	0.141		
Internship supervisors' age							
< 50 years old	2214	427	16,2	-	-		
>=50 years old	6364	1266	16,6	1.03 (0.91–1.16)	0.613		
Mode of practice							
Solo	1777	340	16,1	-	-		
Centre	127	9	6,6	0.37 (0.19–0.74)	**0.005**		
Group	5033	1032	17,0	1.07 (0.94–1.23)	0.311		
Multiprofessional	1641	312	16,0	0.99 (0.84–1.18)	0.941		
Location of practice							
Rural	1433	289	16,8	-	-		
Semi-rural	2096	417	16,6	0.99 (0.84–1.16)	0.871		
Urban	5049	987	16,4	0.97 (0.84–1.12)	0.670		
Volume of consultations							
< 5000	4258	840	16,5	-	-		
>=5000	4320	853	16,5	1.00 (0.90–1.11)	0.986		

* Ordinary illness + Work-related injury or illness

Level of prescriptions

It is difficult to compare the level of sick leave prescriptions with the literature, as there is little data on the subject in the literature. In a 1996 Swedish study, 8.8% of general medicine consultations led to a sick leave, with a variability across GPs from less than 5–25% [9].

Determinants of sick leave prescriptions linked to the patient characteristics

Age

The fact that the oldest patients were less often prescribed a sick leave could be explained by two phenomena. First of all, the "healthy worker" effect is a selection effect. Indeed, only people in a good state of health continue to work as they age, and they therefore remain liable to be prescribed a sick leave [10]. Secondly, the oldest people are more often prone to chronic pathologies (40% of the consultation results from the ECOGEN study concerned a chronic health problem) and are therefore overrepresented among patients seeing their GP, who follows their pathology without necessarily resorting to a sick leave if the pathology does not lead to work-related incapacity [11]. Finally, in cases of work-related incapacity, these patients sometimes need prolonged sick leave that is not renewed at each consultation. Indeed,

Table 3 Levels of sick leave prescription according to the domain concerned

	No sick leave	Sick leave*	Percentage of sick leaves (%)
	n = 18,060	*n* = 1715	
System			
A (General)	3358	83	2%
A98 (Health management, medical prevention)	2224	0	0%
B (Haematological)	191	6	3%
B80 (Anaemia by B9 or B12 deficiency	42	1	2%
B90 (HIV / AIDS)	44	0	0%
B99 (Other blood-related conditions	22	3	12%
D (Digestive)	1309	229	15%
D01 (Generalised abdominal pain)	103	8	7%
D02 (Abdominal pain, epigastric pain)	81	4	5%
D12 (Constipation)	122	1	1%
D70 (Gastrointestinal infection)	109	75	41%
D73 (Gastroenteritis presumed infectious)	97	83	46%
D84 (Oesophageal disorders)	160	0	0%
F (Ophthalmological)	137	6	4%
F70 (Infectious conjunctivitis)	37	0	0%
F71 (Allergic conjunctivitis)	24	0	0%
F72 (Blepharitis, stye, chalazion)	17	0	0%
H (ENT)	259	16	6%
H70 (External otitis)	35	1	3%
H71 (Acute otitis media)	43	2	4%
H81 (Excess earwax)	42	0	0%
H82 (Ménière's disease)	35	10	22%
K (Cardiovascular)	1405	37	3%
K86 (Hypertension with no complications)	754	2	0%
L (Locomotor)	2482	518	17%
L03 (Lumbar symptoms and complaints)	112	22	16%
L15 (Knee symptoms and complaints)	100	11	10%
L18 (Muscular pain)	124	13	9%
L83 (Cervical syndrome)	100	19	16%
L84 (Dorso-lumbar syndrome with no imagery	244	80	25%
L86 (Dorso-lumbar syndrome with imagery)	203	90	31%
L87 (Bursitis not classified elsewhere)	245	36	13%
L99 (other osteo-articulatory disease	138	34	20%
N (Neurological)	569	42	7%
N01 (Headache)	61	0	0%
N88 (Epilepsy)	50	0	0%
N89 (Migraine)	145	6	4%
N94 (Neuritis, peripheral neuropathy)	50	5	9%
P (Psychological)	1876	223	11%
P06 (Sleep disturbance)	233	4	2%
P74 (Anxiety disorders)	248	24	9%
P76 (Depression)	545	148	21%

* Ordinary sick leave + work-related injury or illness

professionally active people with long-term illnesses seem to have more prolonged sick leaves [6].

Socio-professional category

Our study evidenced a particularly high percentage of sick leaves among labourers. This could be mainly explained by the fact that labourers are generally in a poorer state of health and have a lower life expectation than executives, for instance [12]. In addition, labourers' working conditions are usually harsher than in other socio-professional categories. Indeed, a study in 2013 on working conditions in France showed that 63% of labourers were exposed to at least 3 physical constraints, against 46% of retail employees and 8% of executives [13].

Table 4 Levels of sick leave prescription according to the domain concerned (continued)

	No sick leave	Sick leave*	Percentage of sick leaves (%)
	n **= 18,060**	***n*** **= 1715**	
System			
R (Respiratory)	2189	365	14%
R74 (Acute infection of the upper respiratory tracks)	760	114	13%
R75 (Acute or chronic sinusitis)	188	46	20%
R78 (Acute bronchitis)	202	31	13%
R80 (Influenza)	85	95	53%
S (Dermatological)	978	34	3%
S03 (Wart)	33	0	0%
S04 (localised sweeling on the skin)	29	1	3%
S10 (Boil)	40	1	2%
S18 (Cut)	45	11	20%
S71 (Herpes Simplex)	38	0	0%
S74 (Dermatophytosis)	87	1	1%
S87 (Atopic dermatitis, eczema)	51	2	4%
S88 (Dermatitis, contact dermatitis	58	0	0%
S91 (Psoriasis)	30	0	0%
S96 (Acne)	48	0	0%
S99 (Other skin disease)	43	0	0%
T (Endocrine)	1512	9	1%
T86 (Hypothyroidism)	207	0	0%
T90 (Non-insulin-dependent diabetes)	284	1	0%
T93 (lipid metabolism disorder)	434	0	0%
U (Nephrological)	298	20	6%
U70 (Pyelonephritis)	18	6	25%
U71 (Cystitis, other urinary infection)	132	5	4%
W (Obstetrics)	585	44	7%
W11 (Oral contraception)	268	0	0%
W78 (Pregnancy)	147	22	13%
X (Gynaecological)	435	21	5%
X02 (Period pain)	25	0	0%
X05 (Absence of periods)	30	0	0%
X08 (Intermenstrual bleeding)	25	0	0%
X11 (Symptoms and complaints linked to the menopause)	66	0	0%
X72 (Vaginal candidiasis)	32	2	6%
X76 (Female breast cancer)	32	4	11%
X84 (Vaginitis or vulvitis not classified elsewhere)	19	1	5%
X99 (Other female genital disease)	13	7	35%
Y (Urological)	121	5	4%
Y07 (Sexual impotence not classified elsewhere)	17	0	0%
Y73 (Prostatitis)	14	1	7%
Y85 (Benign prostatic hypertrophy)	33	0	0%
Z (Social)	356	57	14%
Z05 (Problem at work)	77	37	32%
Z12 (Relationship issues with work partners)	30	1	3%
Z16 (Relationship problems with children)	22	0	0%
Z22 (Problems due to illness of a family member)	30	0	0%
Z23 (Loss of a family member)	18	8	31%

* Ordinary sick leave + work-related injury or illness

The level of sick leaves was particularly low among self-employed workers. This could be explained by the fact that the self-employed choose their business over their health. It was thus demonstrated that, compared to surviving employees, self-employed workers more often continued to work after cancer, and worked for longer. Similarly, even if the self-employed are a heterogeneous category, their relatively good state of health, and the fact that at least some of them have a health cover scheme for independent workers that provides a less favourable social protection (although the differences are tending to decrease), could also contribute to fewer resorts to sick leave [14].

Other factors linked to patient characteristics, in particular their functional abilities, their ability to arouse empathy, their cognitive and behavioural status, their ability to adapt, their potential secondary advantages, their social situation, or potential psychiatric comorbidities, for instance, are liable to influence the prescription of sick leave, as was demonstrated in a European study by Merkus et al. [15]. The ECOGEN study did not enable us to examine these specific factors.

Determinants of sick leave prescriptions linked to health problems

The statistical analyses showed that the levels of sick leave were particularly high for consultation results relating to locomotive, digestive, respiratory, social or psychiatric problems.

Locomotive pathologies mainly concerned muscular-skeletal disorders, including lumbago. Lumbago was in fact the second reason for resorting to a GP, leading to a sick leave in one in fives instances and accounting for the third cause of disability recorded in the general health cover scheme [16]. Deriving from the working conditions, lumbago and muscular-skeletal disorders are often the source of disability at work and are often the trigger for sick leave prescriptions.

Concerning digestive and respiratory problems, they could correspond to acute infectious pathologies, for which the main reason for consultation can be to obtain a sick leave prescription. The period during which the study was carried out (November 2011-April 2012) also needs to be taken into account, mainly winter, a season when acute infections and epidemics are the most frequent. Indeed, patients who saw their GP for influenza registered higher levels of sick leave (53%), as did those who presented gastroenteritis (46%). These are indeed acute viral pathologies that do not require any specific treatment, which suggests that obtaining sick leave is one of the main reasons for seeing a GP for these pathologies.

Conversely, the levels of sick leave prescriptions were particularly low for endocrine, dermatological, haematological ophthalmological and urological pathologies. Indeed, endocrine and haematological pathologies tend to be more chronic but do not systematically require a sick leave prescription. As for dermatological pathologies, they entail less functional impairment and therefore less frequently require sick leave.

Determinants for sick leave prescriptions linked to GPs

Our study showed that longer consultations were associated with lower levels of resort to sick leave prescription. As sick leave prescriptions can generate a form of negotiation, refusing a sick leave prescription can indeed take more time, to listen to and exchange with the patient [17]. Furthermore, follow-up consultations for chronic illnesses that do not require a sick leave are generally long, whereas consultations for acute pathologies (of the infectious type) are generally shorter [18].

Strengths and limitations of the study

This work was based on the ECOGEN study, which enabled us to examine a large number of consultations on a national scale that were systematically coded, which therefore enabled us to obtain robust statistical power.

The ECOGEN study was not specifically designed to study sick leave prescriptions. While the use of the ICPC-2 classification enables systematic collection of certain types of data, it can lack precision for other types of data. Indeed, there is no specific code allocated to sick leave from work. It was therefore necessary to detect corresponding procedures using verbatim, which is often imprecise or lacking, and thus a possible source of information bias that could have led to an underestimation of the frequency of sick leave prescriptions. The number of sick leaves could also have been underestimated due the fact that a certificate of work-related injury or illness without explicit mention of sick leave was not considered as a sick leave. Furthermore, the duration of sick leaves was not available, and there was no information as to whether they were initial sick leaves or whether they had been prolonged. Finally, certain aspects of the context (patient-doctor relationship, patients' socio-professional context, functional abilities, etc.) were not included, so that it was not possible to study the determinants of prescription exhaustively.

The study was carried out from November to April, during the winter season, which is not representative of annual activity, with an over-representation of seasonal diseases such as influenza.

The fact that all the GPs in the study were internship supervisors could entail issues on their representativeness. However, a comparison of the internship supervisor data from the ECOGEN study with data concerning GPs in France for the year 2012 did not show any significant difference for mean age, gender, professional sector, number of annual consultations and location of practice

[11]. Furthermore, a study by Letrilliart et al. showed that internship supervisors' patients were globally representative of patients in general medicine consultations. However, this same study, using 3 indicators (diabetes follow-up, anti-flu vaccination and mammography follow-up), suggested that internship supervisors potentially had better clinical performances than French GPs [19]. Finally, data was lacking to determine whether being an internship supervisor was liable to introduce a bias concerning sick leave prescriptions.

In the end, therefore, this study makes it possible to present national clinical data relating to the prescription of sick leave during consultations with general practitioners, independently of social security reimbursement data.

Conclusion and perspectives

This work has enabled us to examine the main determinants of sick leave prescriptions and to identify the patient and consultation characteristics leading to these prescriptions. Thus, 16.5% of the consultations concerning non-retired patients aged 18 to 65 led to a sick leave prescription. This prescription level appeared low among older patients, executives or in the case of longer consultations. Alongside, the level of sick leave prescription was higher in case of consultation results relating to the locomotive, digestive, and respiratory systems, and to social issues. Although the fact that the study was not specifically designed to study the prescription of sick leave and that the data relate to a relatively short period, the winter of 2011–2012, it provides important insights into the prescription of sick leave. In fact, there is no other national study that exhaustively and systematically examines GP consultations. This makes it possible to obtain clinical data on the prescription of sick leave in general practice from a large national sample. A better understanding of sick leave prescriptions could contribute to improving the relevance of their prescription. It would therefore be interesting to conduct a qualitative study specifically on the determinants of sick leave prescriptions, enabling a more refined understanding of what is at stake when prescribing sick leaves.

Abbreviations

CGNE	French Collège National des Généralistes Enseignants
CR	Consultation Results
CP	Care Procedures
ECOGEN	Eléments de COnsultation en medicine GENérale
GP	General practitioners
IS	Internship Supervisor's
RfC	Terms of reasons for consultation

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Author contributions

CB and AR coordinated the study and writing of the manuscript. CB, MP and CO participated in the data analysis. MP, CO, YR and AP contributed to the drafting of the manuscript.

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Data availability

The datasets analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

A flyer in the GP waiting room informed patients about the study. GPs presented the study to patients at the beginning of the consultation and obtained their written informed consent. The ECOGEN study was declared to the French competent authorities: Comité consultatif sur le traitement de l'information en matière de recherche dans le domaine de la santé (CCTIRS, n° 11605), Commission nationale de l'informatique et des libertés (CNIL, n° 1549782). An ethics committee approved the ECOGEN study (CPP Sud-Est IV, Lyon, France, registration number: L11-149, approval date: 10/11/2011) and included consent for ancillary studies on the ECOGEN database. All procedures performed in the study involving human participants were in accordance with the national research committee and with the 1964 Helsinki declaration.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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