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Asthma Patients' Ambulatory Care Expenditures in 2006

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In France, asthma patients' total ambulatory medical expenditures is one and a half times higher than for non-asthmatics, according to data matching of IRDES' "Health, Health Care and Insurance" survey (ESPS) with Health Insurance claims. This is due to the condition itself, the level of asthma control and co-morbidities more frequently affecting asthma sufferers (allergies...).

The level of control is, however, insufficient for 6 out of 10 asthmatics and only 12.5% of them consulted an office-based pneumologist (10 % of asthma patients as a whole). General practitioners remain on the front line in asthma monitoring for all patients.

Medication is the highest item in all asthma-related ambulatory care expenditures but is concentrated among a percentage of varying consumers according to therapeutic class. A third of asthmatics receive no anti-asthma treatment. This suggests that health professionals can still improve asthma management in terms of education programs and risk-factor reduction (environmental measures).

In France, the level of asthma control is satisfactory for 4 out of 10 asthmatics; symptoms are either controlled or minimal. Inversely, for 6 out of 10 asthmatics, the level of control is insufficient: their symptoms are partly controlled in 46% of cases, and uncontrolled in 15% of cases. Among the latter, a quarter declared not taking controller medications[1] (IRDES, 2009) [Methods insert]. The present study completes these epidemiological findings by means of a socio-economic analysis based on data matching of the 2006 "Health, Health Care and Insurance" survey (ESPS) with Health Insurance claims. The latter providing the totality of asthmatics' medical consumption claimed, the medication treatment step declared in the ESPS survey is compared with the drugs effectively delivered (insert 1).

With this information, we can then attempt to answer a number of questions: What medications are prescribed to asthmatics? Who prescribes them? How asthma is monitored? Other than the socio-economic factors highlighted during the first phase of the study (the risk of insufficient control is higher for a low-income household), our interest here is to objectively measure asthma monitoring, the medications prescribed and delivered to patients, and to calculate overall costs (insert 2).

Total ambulatory care expenditures are 1.5 times higher for asthmatics than for non-asthmatics

An asthmatic's total ambulatory care expenditures integrate both treatment for asthma and other related pathologies. In 2006, asthma patients' average annual expenditure amounted to 1,605€ against 1,100€ for non-asthmatics of comparable age and sex groups, in other words 1.5 times higher. In addition to asthma

[1] Copy editor's note : Controllers are medications taken daily on a long-term basis.

treatment, a percentage of this additional cost is related to co-morbidities (graph 1). As the limited sample size precludes taking hospitalisations into account, the analysis focuses on ambulatory asthma monitoring where prevention of acute symptom exacerbations, potentially leading to emergency service consultations or costly hospitalisations, constitutes one of the main challenges.

Co-morbidity and levels of asthma control explain a major proportion of these additional costs

In 2006, medical expenditures are higher for asthmatics than for non-asthmatics and attest for additional non-asthma-related costs 1.2 times higher, that is to say 1,275€ *versus* 1,100€, respectively. One of the factors explaining these additional costs is probably the higher incidence of co-morbidity among asthmatics which includes pathologies related to atopic susceptibility (eczema, allergic rhinitis), gastro-œsophageal reflux, depression and/or anxiety, and obesity [Afrite *et al.*, 2008]. The other determining factor is the level of symptom control which underpins asthma management. The average annual medical expenditures for uncontrolled asthmatics is twice that for controlled asthmatics (2,920€ *versus* 1,371€). This is essentially due to higher asthma-related expenditures combined with co-morbidities; the volume of expenditures for related illnesses being doubled (1,125€ *versus* 2,207€).

Medical expenditures for partly controlled and controlled asthmatics are virtually the same (1,322 € *versus* 1,371 €), but the former would achieve better symptom control with better asthma treatment and monitoring thus improving their quality of life. These results, coherent with ESPS 1998 results [Com-Ruelle, 2000], raise a number of hypotheses: less overall atten-

METHODS

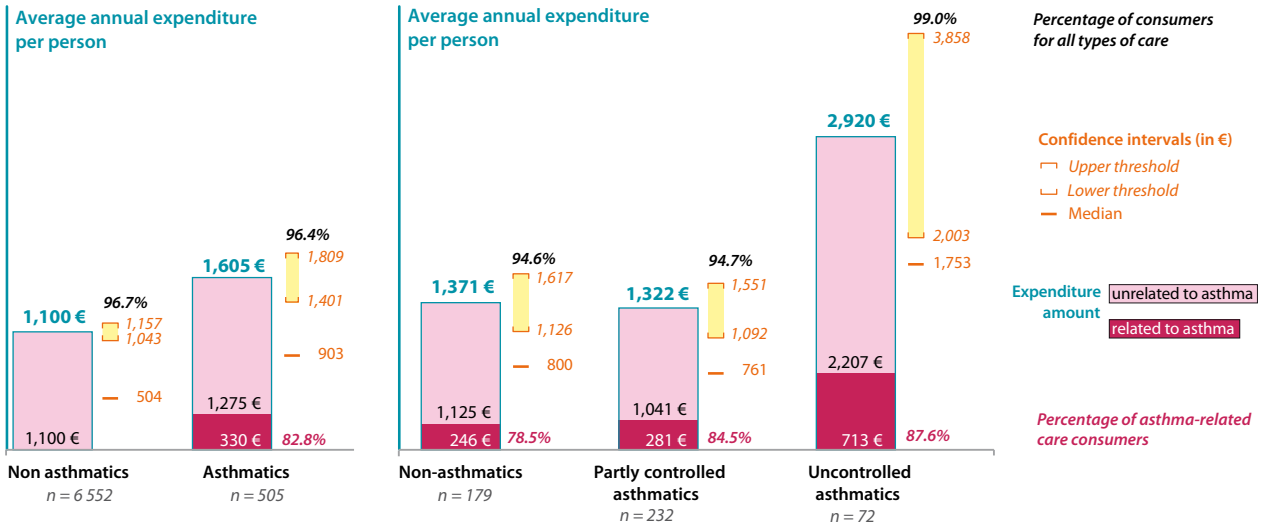
Asthma classification according to symptom control level in the 2006 ESPS survey

The classification of asthma according to level of control follows the revised 2006 Global Initiative for Asthma (GINA) recommendations. The ESPS 2006 does not provide data on emergency medication requirements and elementary pulmonary function data. The notion of symptom exacerbation is evaluated by the consulted GP and/or hospitalisation following an asthma attack. The classification presented below has been adapted, taking these factors into account.

Level of control	Classification rules	Clinical signs experienced over the last 12 months
Controlled	4 criteria	Diurnal symptoms: None or '< once a week' Nocturnal symptoms: None Limitations of activities : None Exacerbations: None
Partially controlled	1 or 2 criteria OR	Diurnal symptoms: '≥ once a week but < once a day' Nocturnal symptoms: from '< twice a month' to '2 to 4 times/week' Limitations of activities: Yes
	1 criterion	Exacerbations : Yes
Totally uncontrolled	3 criteria OR	Diurnal symptoms: '≥ once a week but < once a day' Nocturnal symptoms: from '< twice a month' to '2 to 4 times/week' Limitations of activities: Yes
	1 criterion	Diurnal symptoms : 'About once a day' or 'All the time' Nocturnal symptoms: 'Nearly every night'

G1

Total ambulatory medical expenditures per person in 2006 amongst non-asthmatics, and asthmatics according to symptom control levels



Reading guide: In 2006, 99 % of uncontrolled asthmatics consumed ambulatory medical care amounting to an average 2,920 € per year, of which 713 € related to asthma and 2,207 € for other motives; only 87.6 % of them made health insurance claims for asthma-related care. Their total expenditure is significantly higher than amongst other asthmatics. The symptom control level was able to be determined for only 483 out of the 505 asthmatics matched.

Source: IRDES, ESPS 2006 data matched with 2006 Health Insurance claims data.

T1

Structure of total ambulatory expenditures per person among non-asthmatics and asthmatics according to level of control in 2006

	Non asthmatics [NA]	Asthmatics [A]	Student test A *vs* NA	Controlled asthmatics [AC]	Insufficiently controlled asthmatics [AIC]	Student Test AC *vs* AIC
	N = 6 552	N = 505		N = 179	N = 304	
Care items						
GP sessions						
Consumer rate	**86.80%**	**90.70%**		**88.50%**	**90.90%**	
Average expenditure	**108 €**	**157 €**	**	**132 €**	**170 €**	**
Confidence intervals	*[105; 111]*	*[142; 172]*		*[113; 150]*	*[148; 191]*	
Median	*71*	*103*		*102*	*106*	
Medications						
Consumer rate	**89.90%**	**93.50%**		**90.50%**	**93.50%**	
Average expenditure	**375 €**	**723 €**	**	**626 €**	**764 €**	not significant
Confidence intervals	*[348; 401]*	*[619; 827]*		*[482; 772]*	*[618; 911]*	
Median	*83*	*265*		*193*	*317*	
Other care						
Consumer rate	**85.60%**	**85.20%**		**82.80%**	**85.10%**	
Average expenditure	**617 €**	**725 €**	*	**613 €**	**767 €**	not significant
Confidence intervals	*[578; 657]*	*[608; 841]*		*[491; 735]*	*[604; 930]*	
Median	*233*	*290*		*331*	*267*	
Ambulatory care in general						
Consumer rate	**96.7%**	**96.4%**		**94.6%**	**95.7%**	
Average expenditure	**1,100 €**	**1,605 €**	**	**1,371 €**	**1,701 €**	*
Confidence intervals	*[1 043; 1,157]*	*[1 401; 1,809]*		*[1 126; 1,617]*	*[1,414; 1,987]*	
Median	*504*	*903*		*800*	*956*	

Reading guide: All motives combined, the average annual expenditure in GP sessions for insufficiently controlled asthmatics is 170€ in 2006, significantly higher to that of controlled asthmatics that is of 132€.

Significance: * 5%, ** 10%.

Source: IRDES, ESPS 2006 data matched with 2006 Health Insurance claims data.

tion paid to their health, poorer access to care and, in all likelihood, a less rigorous medical compliance.

Insufficiently controlled asthmatics more frequently consult a GP

Symptom control not being achieved in insufficiently controlled asthmatics, category made up of partly controlled and uncontrolled patients, their medical treatment should be similar in terms of diagnostic and therapeutic costs. Thus, and because of the limited sample size, our analysis henceforwards groups together partly controlled and uncontrolled asthmatics.

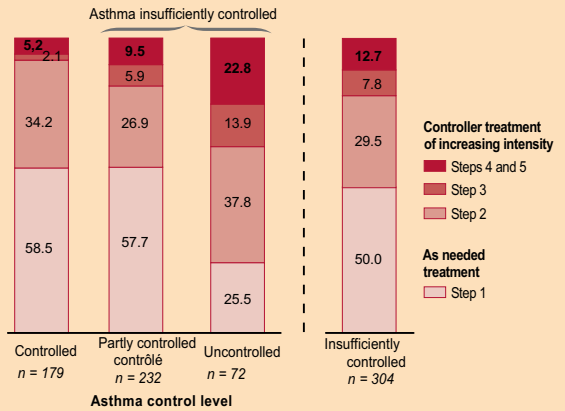
All indications combined, insufficiently controlled asthmatics can be distinguished from controlled asthmatics in that their GP consultation expenditures are 1.3 times higher (170€ *versus* 132€). Expenditures for prescribed medications and other care (specialists, medical auxiliaries, diagnostic procedures) are not statistically different (table 1).

Thus, co-morbidity and level of asthma control appear to explain asthmatics' additional medical expenditures, which can be as much related to asthma as to other associated pathologies. The fact of being asthmatic increases total general medicine expenditures and even more so medication expenditures, all motives

Insert 1

Distribution of declared treatment steps according to level of asthma control

Compared to the 1,076 asthmatics from the ESPS 2006, the 505 ESPS asthmatics matched with data from salaried workers' and self-employed' funds (CNAMTS and RSI respectively) do not present significantly different characteristics. The percentage of individuals declaring treatment steps 1 or 2 is barely higher (51.3% *versus* 50.1% and 29.5% *versus* 28.4% respectively) ; those of asthmatics having declared treatment step 3 is lower (5.4% *versus* 7.5%); and those of those having declared treatment steps 4 or 5 is similar (8.9% *versus* 9.4%)[a]. These differences do not justify additional weighting to that already applied the data-matched population as a whole.



The treatment steps are established following the GINA 2006 recommendations. Using a five tier system reflects the increase in the intensity of therapeutic treatment in terms of dosage and/or the quantity and nature of medications required to control asthma symptoms (from step 1: on-demand treatment of symptoms without long-term treatment; steps 2 to 4: more or less important daily requirement of inhaled corticosteroids associated or not with additional treatments; to step 5: oral corticosteroids). This definition of progressive treatment steps corresponds to the gradual intensity of clinical symptoms.

[a] *Cf. Questions d'économie de la santé* n° 138, 2008.

combined. Nevertheless, the insufficient control of symptoms is only significant in asthma monitored by GPs. Despite this higher cost for insufficiently controlled asthmatics, symptom control is not achieved. This raises the question of the structure of asthma-related expenditures and the adaptation of asthma management to symptoms.

Asthma-related expenditures represent 21% of total ambulatory care for asthmatics

Asthma-related expenditures (insert 2), excluding hospitalisations, amounted to an average 331€ per year and per asthma patient in 2006 (table 2). As expected, medication represents the first item, with two thirds (69%) of total expenditures for an average cost of 227€ per asthma patient. Average spending per asthma patient represents 44€ for GP consultations and 60€ for all other asthma-related care. These averages cover considerable disparities, notably according to the level of symptom control.

Other than medication, asthma patients' use of specialist are is low

The remaining ambulatory asthma-related expenditures total 18% of asthma expenditures, that is an average 60€ per asthma patient in 2006.

One asthma patient in 12 had at least one asthma-related physiotherapy session over the last twelve months. Other diagnostic procedures (pulmonary radiography, allergenic and biological tests) and consultations with other specialists (ENT, paediatricians and internal medicine) have little weight in the total medical expenditures whatever the level of symptom control.

According to good practice guidelines (HAS 2004, GINA 2006), it is recommended that all insufficiently controlled asthmatics (6 out of 10 in our sample) consult a pneumologist and pass a pulmonary function test (PFT) at least once a year. Yet, only 12.5% of them consulted a pneumologist in 2006 and only 10% of asthmatics as a whole. Similarly, only one out of 10 asthmatics had a PFT over the last twelve months which was most frequently prescribed by a pneumologist (71% of cases)[2]. Yet, pulmonary function is one of the determining factors in the diagnosis and monitoring of asthma[3].

The general practitioner is on the front line in asthma monitoring

General practitioners (GP) are on the front line in asthma monitoring: on average, an asthma patient had 2.1 asthma-related sessions (consultations or visits), in other words a third of their total number of GP sessions. However, if for 46% of asthmatics none of the GP consultations resulted in the prescription of anti-asthma drugs during the course of the year, these sessions can nevertheless be asthma-related and the costs corresponding to this expenditure item underestimated.

Insufficient control gives rise to higher average expenditures but covers a number of disparities in asthma management

Average medical expenditures for insufficiently controlled asthmatics is 1.6 times higher than for controlled asthmatics (385€ *versus* 246€) [table 2]. This is essentially due to prescribed asthma medication representing 66.5% of total expenditures, that is 1.4 times higher than for controlled asthmatics (256€ *versus* 182€). Insufficiently controlled asthmatics equally spend 1.3 times more on GP consultations (48€ *versus* 36€). It should nevertheless be noted that over a third of these consultations are not a priori asthma related (36.0%)[4] . Non asthma-related expenditures, on average much higher (81€ *versus* 29€), only however concern a quarter of insufficiently controlled asthmatics and include pneumologist sessions for only 1 in 8 of these patients in 2006.

T2 **Structure of asthma-related ambulatory care expenditures and average expenditure per asthmatic according to control level in 2006**

	Asthmatics	Controlled asthmatics [AC]	Insufficiently controlled asthmatics [AIC]	Student Test AC *vs* AIC
	N = 505	N = 179	N = 304	
Asthma-related care items				
GP sessions				
Consumer rate	**59.9%**	**53.5%**	**63.6%**	
Average expenditure	**44 €**	**36 €**	**48 €**	**
Confidence intervals	*[39; 49]*	*[28; 44]*	*[41; 55]*	
Median	*20*	*20*	*21*	
Medications				
Consumer rate	**82.2%**	**77.9%**	**84.50%**	
Average expenditure	**227 €**	**181 €**	**256 €**	**
Confidence intervals	*[197; 256]*	*[137; 228]*	*[214; 296]*	
Median	*75*	*40*	*97*	
Other care				
Consumer rate	**23.9%**	**21.0%**	**25.6%**	
Average expenditure	**60 €**	**29 €**	**81 €**	**
Confidence intervals	*[42; 78]*	*[16; 40]*	*[52; 111]*	
Median	*0*	*0*	*0*	
Ambulatory care in general				
Consumer rate	**82.8%**	**78.5%**	**85.2%**	
Average expenditure	**331 €**	**246 €**	**385 €**	**
Confidence intervals	*[285; 376]*	*[189; 304]*	*[318; 450]*	
Median	*122*	*78*	*157*	

Reading guide: In 2006, 84.5% of insufficiently controlled asthmatics consumed asthma-related medications amounting to an average 256€, significantly higher than the average for controlled asthmatics that amounts to 182€.

Significance: * 5%, ** 10%.

Source: IRDES, ESPS 2006 data matched with 2006 Health Insurance claims data.

[2] This non-consultation rate is nevertheless underestimated in that, as previously indicated only consultations resulting in the prescription of anti-asthmatic drugs are associated with asthma

[3] It should be noted here that consultations with hospital pneumologists and PFTs carried out in hospital are not correctly accounted for in Health Insurance data which minimises the weight of these procedures in our data.

[4] This rate is, however, overestimated given that in this analysis are considered asthma-related only those consultations resulting in the prescription and purchase of anti-asthma drugs.

Medications dominate ambulatory asthma-related expenditures

Prescription asthma medication expenditures are analysed through overall expenditure by therapeutic class and volume using the number of 'boxes' of medication delivered. Different therapeutic classes of drugs are involved in the treatment of asthma. Anti-asthma drugs (β2 mimetics, inhaled corticosteroids and add-on treatments) have a more specific action on the symptoms whereas adjuvant drugs (anti-allergy drugs, antibiotics, vaccines) act on environmental factors and treat allergy or infections of the upper respiratory tract. The 'pure' anti-asthma drugs (β2 mimetics and inhaled corticosteroids) added to oral corticosteroids prescribed for asthma constitute the major part of asthma-related drug expenditures (65%, that is 148€ per year and per asthma patient), way above add-on treatments (26€) and adjuvant drugs (53€). In reality, medication expenditures are more or less concentrated among a percentage of consumers that vary according to therapeutic class. Thus the consumption rate among asthmatics (at least one prescription delivered) is 63.5% for 'pure' anti-asthma treatment, 14.5 for add-on treatment and 73.5% for adjuvant treatment (table 3).

Expenditures in antihistamines are higher among insufficiently controlled asthmatics

Among insufficiently controlled asthmatics, total expenditures in antihistamines (β2 mimetic, inhaled and oral corticosteroids, and add-on treatments) is almost 1.5 times higher than for controlled patients (198€ *versus* 138€). This average nevertheless hides a number of disparities since, if 13% of insufficiently controlled asthmatics (see insert 1) are already at a high treatment step (4 or 5), the others could benefit from a higher treatment step better adapted to their symptoms: half are at step 1 (no treatment or as-needed reliever medication), 29% take low doses

T3 **Total average annual expenditures for asthma-related medications prescribed in ambulatory care in 2006 among asthmatics by therapeutic indication and control level**

			Asthmatics	Controlled asthmatics [AC]	Insufficiently controlled asthmatics [AIC]	Student Test AC *vs* AIC
			N = 505	N = 179	N = 304	
Therapeutic indication	**Classes of drugs**					
Treatment of an asthma attack (A)	Short-term beta blockers (β2CDA = R03A4)	**Consumer rate**	**40.3%**	**31.5%**	**45.3%**	
		Amount spent	**10 €**	**6 €**	**13 €**	
		Confidence intervals	*[7; 13]*	*[3; 9]*	*[8; 17]*	
Long-term treatment (B)	Inhaled corticosteroids (CSI = R03D1)	**Consumer rate**	**23.0%**	**18.4%**	**25,2%**	
		Amount spent	**28 €**	**24 €**	**31 €**	
		Confidence intervals	*[19; 37]*	*[12; 37]*	*[18; 43]*	
	Short-term beta mimetics (β2LDA = R03A3)	**Consumer rate**	**7.4%**	**6.0%**	**8.4%**	
		Amount spent	**12 €**	**8 €**	**14 €**	
		Confidence intervals	*[7; 17]*	*[1; 15]*	*[7;21]*	
	Fixed associations of CSI and β2LDA (R03F1)	**Consumer rate**	**29.2%**	**21.8%**	**34.1%**	
		Amount spent	**94 €**	**82 €**	**105 €**	
		Confidence intervals	*[75; 113]*	*[48; 116]*	*[81; 129]*	
	Oral corticosteroids (H02A2)	**Consumer rate**	**28.5%**	**21.3%**	**32.7%**	
		Amount spent	**4 €**	**2 €**	**4 €**	
		Confidence intervals	*[3; 4]*	*[2; 3]*	*[3; 6]*	
Pure anti-asthma treatments (A + B = C)		**Consumer rate**	**63.5%**	**56.8. %**	**67.7%**	
		Amount spent	**148 €**	**122 €**	**167 €**	**
		Confidence intervals	*[125; 171]*	*[86; 161]*	*[136; 197]*	
Additional treatment (D)	Oral antileucotrines , xanthines, cromones, anticholinergiques alone or associated	**Consumer rate**	**14.5%**	**8.2%**	**18.1%**	
		Amount spent	**26 €**	**16 €**	**31 €**	
		Confidence intervals	*[18; 34]*	*[4; 27]*	*[20; 41]*	
Total anti-asthma treatments (C + D = E)		**Consumer rate**	**63.9%**	**56.8%**	**68.1%**	
		Amount spent	**174 €**	**138 €**	**198 €**	*
		Confidence intervals	*[147; 200]*	*[97; 181]*	*[161; 234]*	
Adjuvant treatments (F)	Anti-allergy, antibiotics à visée potentiellement respiratoire, flu vaccines and antipneumoccocique	**Consumer rate**	**73.5%**	**70.5%**	**74.8%**	
		Amount spent	**53 €**	**43 €**	**58 €**	
		Confidence intervals	*[46; 59]*	*[34; 53]*	*[49; 67]*	
All asthma-related medications combined (E + F = G)		**Consumer rate**	**82.2%**	**77. 9%**	**84.5%**	
		Amount spent	**227 €**	**181 €**	**256 €**	**
		Confidence intervals	*[197; 256]*	*[137; 228]*	*[214; 296]*	

Reading guide: Only 67.7% of insufficiently controlled asthmatics received 'pure' anti-asthma treatment in 2006, for an average expenditure of 167€, significantly higher than the corresponding average expenditure for controlled asthmatics.

Significance: * 5%, ** 10%

Source: IRDES, ESPS 2006 data matched with 2006 Health Insurance claims data.

of inhaled corticosteroids (step 2) and 8% are at step 3 (average dose of inhaled corticosteroids more or less associated with a long-acting β2 drug) [table 3].

Fixed-combinations form over half the expenditures in anti-asthma drugs

The fixed-combinations of inhaled corticosteroids and long-acting β2 mimetics constitute the highest expenditure item in 2006, that is an average 94€ per asthma patient, considering all asthmatics, the different classes of anti-asthma drugs and excluding adjuvant drugs. These expenditures are higher among insufficiently controlled asthmatics than among controlled asthmatics (105€ versus 82€). In reality, this expenditure item is concentrated among 29.2% of consumers (table 3).

Inhaled corticosteroids (ICS) generate expenditures that are on average three times lower (28€) and concern 23% of consumers. The long-acting β2 mimetics cost even less (12€) and are delivered to only 7.4% of asthmatics whereas according to GINA 2006 recommendations, they should only be prescribed in association with inhaled corticosteroids. Short-acting β2 mimetics are more generally prescribed (40.3% of consumers) despite a lower associated expenditure (10€). Oral corticosteroids, prescribed on-demand to treat exacerbations or in the case of a controller treatment for severe asthma, concern 28.5% of asthmatics but represent a minimal expenditure per asthmatic (4€), the cost of a box being very low. Among the additional treatments, leukotriene antagonists are the most prescribed: 9% of asthmatics have had at least one delivery (19€ on average per asthmatic).

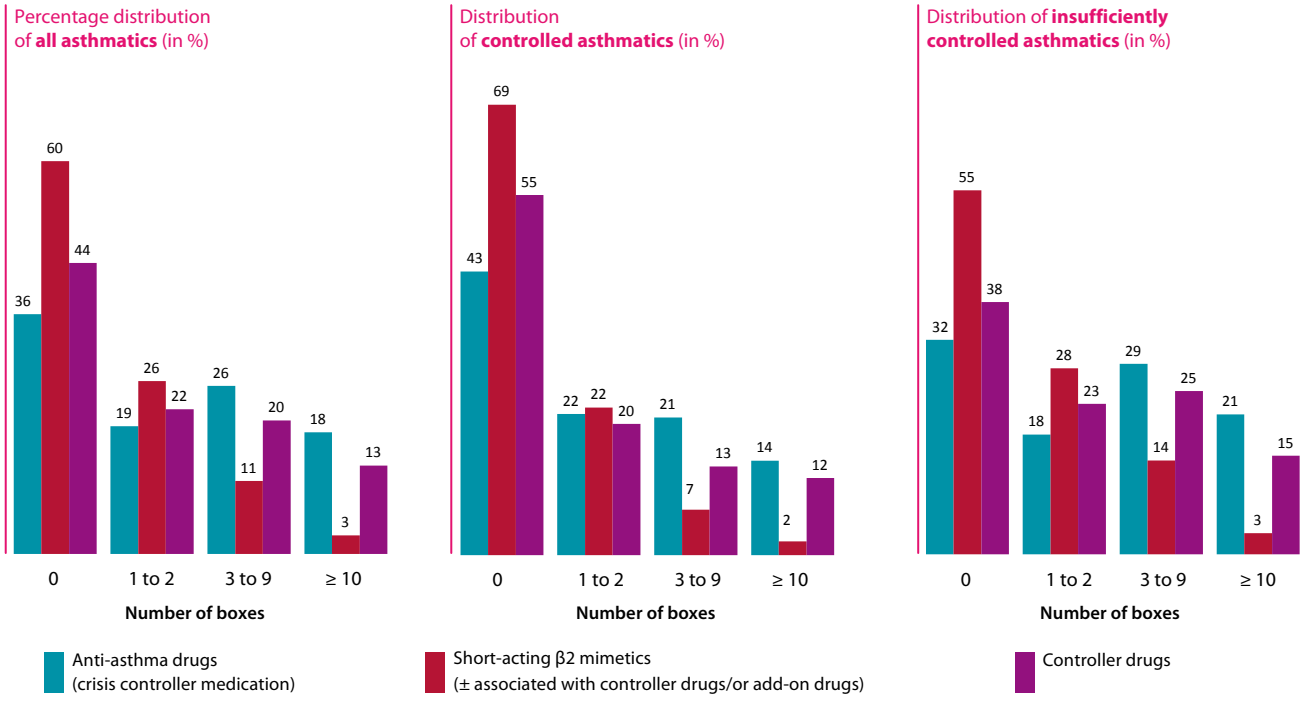
For all the therapeutic classes combined, the consumption rate and average expenditure levels are higher in cases of insufficiently controlled asthma. These results, obtained from ambulatory claims data, match drug sales data that, in terms of turnover, equally place fixed drug combinations in the lead in comparable proportions.

Context

In France, asthma management constitutes one of the hundred priority objectives fixed by the 2004 Public Health law.
Its prevalence is in continuous progression increasing from 5.8% in 1998 to 6.7% in 2006.
In parallel, since 2000 the mortality rate and the number of hospitalisations related to asthma have diminished except among young children aged 4 or under.
These results suggest an improvement in the overall caredelivered to asthma patients.
A first analysis on the prevalence of asthma and its determinants was published by IRDES in 2009. It was based on data collected among the general population by means of questions integrated into the Health, Health Care and Insurance survey (ESPS) in 2006. This study completes the epidemiological results based on the 2006 ESPS survey by the medico- economic analysis of associated data from National Health insurance reimbursements. This research programme was carried out in partnership with InVS, AstraZeneca and Novartis.

Average annual expenditures on asthma medications per patient do not reflect

G2 **Distribution of asthmatics according to number of anti-asthma medication boxes delivered in 2006 and symptom control level**



Reading guide: In 2006, 38% of insufficiently controlled asthmatics did not acquire a single box of anti-asthma drugs, 23% acquired only one to two boxes, 25% 3 to 9 boxes and 15% 10 or more boxes.

Note: * Significance at 5%, ** Significance at 10 %.

Source: IRDES, ESPS 2006 data matched with 2006 Health Insurance claims data.

the disparities in therapeutic treatments. Moreover, it integrates a price effect that is possible to subtract by volume analysis according to the number of presentations or 'boxes' delivered (boxes, inhalers, etc.)..

The therapeutic coverage of asthma patients is extremely disparate

The number of 'boxes', even though approximate as it does not account for content or dosage variations, allows an initial estimation of the therapeutic coverage of asthmatics to be established over time. In effect, according to the posology, a 'box' can frequently cover one, two or even three months of treatment.

All levels of symptom control combined, 36% of asthmatics are not delivered a single 'box' of anti-asthma drugs during the course of the year. If this percentage decreases from 43% among controlled asthmatics to 32% among insufficiently controlled asthmatics, it nevertheless remains high among the latter given their symptoms (graph 2).

Concerning controller medication, 55% of controlled asthmatics did not acquire a single box , 20% 1 to 2 boxes, 13% 3 to 9 boxes and 1% 10 or more boxes. Among insufficiently controlled asthmatics, the percentage of those having received none or only 1 to 2 boxes remains high, 38% and 23% respectively. According to good practice recommendations, these patients should benefit from continuous annual or periodic treatment, but only 25% received 3 to 9 boxes and 15% 10 or more boxes delivered in 2006.

As for treatment in the case of an asthma attack, 60% of asthmatics did not receive a single box of short-acting β2 mimetics, 26% 1 to 2 boxes and 14% 3 or more boxes. The latter figure, concerning 9% of controlled asthmatics, reaches 17% among insufficiently controlled asthmatics. The number of boxes of anti-asthma drugs delivered to an asthmatic, together with the percentage of consumers and the average annual cost per therapeutic class, provides additional information on the therapeutic coverage of asthmatics and reveals considerable disparities indicating that asthma treatment is frequently insufficient and, in a certain number of cases, somewhat lacking.

* * *

A considerable proportion of asthmatics never achieved symptom control due to insufficient treatment. A better ambulatory asthma management would greatly improve asthma patients' quality of life by preventing periods of acute symptom exacerbations and complications that can prove dramatic, lead to expensive hospitalisations and even death.

The results presented here already highlight the fact that health professionals can still improve asthma management and monitoring in terms of managing environmental factors, notably by treating the causes of allergies, adapting medications to symptom severity and lung function measurements, taking co-morbidities into account and providing therapeutic education to improve patient compliance.

Furthermore, health professionals, notably general practitioners and pneumologists, should be informed as to the existence of patent social inequalities (income, education level, habitat…) as they have an influence on patient management. In effect, we demonstrated [Afrite *et al.*, 2008] that access to care weighed more heavily on uncontrolled asthmatics; if effective medications exist they are nevertheless costly and not integrally reimbursed.

In view of this, and to measure the economic repercussions of a more adapted treatment of asthma, a simulation of the costs generated by a first phase asthma management programme following GINA 2006 recommendations has been scheduled. This would include the characterisation of asthma patients whose treatment is the furthest removed from recommended good practice, (does it concern the most underprivileged populations?) and to evaluate the extent of the financial effort required. ♦

Insert 2

Nature of ambulatory medical services related to asthma

Only ambulatory care expenditures are analysed here as the size of our sample does not allow for an analysis of expenditures related to hospitalisation, which remains a rare event.

Three main expenditure items are identified: medications, GP consultations and other asthma-related expenditures.

For the general medicine sessions (consultations, visits, technical or specialist procedures), we only retain procedures carried out by practitioners responsible for the care of asthma patients (general practitioners, pneumologists, paediatricians, ENT and internal medicine specialists). When a session is associated with the delivery of anti-asthma, the hypothesis is that there is a high probability that the consultation is asthma related. A certain number of sessions that do not result in a prescription for anti-asthma drugs are nevertheless part of routine asthma monitoring and thus the cost of care of asthmatics may be under-estimated. On the contrary, in the absence of other respiratory co-morbidities, all consultations with a pneumologist have been related to asthma.

Other treatments group together sessions with other specialists, auxiliary medical procedures, technical procedures and medical biology.

Among the auxiliary medical procedures physiotherapy sessions are considered as being related to asthma in the absence of other co-morbidities that could justify its utilization (chronic rheumatic diseases, respiratory diseases such as BPCO or emphysema, cardiovascular diseases…).

Technical procedures include pulmonary radiography, bronchial fibroscopy, respiratory function tests (RFTs), arterial blood gas, nocturnal oximetry, 6-minute timed-walking test, desensitization acts, and allergy tests.

Medical biology concerns theophylline levels as well as specific and total dosing of IgE.

In France, asthma is one of the hundred priority objectives fixed by the 2004 Public Health Act. Its prevalence increases regularly, increasing from 5.8% in 1998 to 6.7% in 2006. In parallel, since 2002, the mortality rate from asthma and the number of hospitalisations have diminished, with the exception of young children up to 4 years old. These results suggest a global improvement in the care of asthma patients. A first analysis on the prevalence of asthma and its determinants was published by IRDES in 2009 from data collected among the general population through questions integrated in the 2006 Health, Health Care and Insurance Survey (ESPS). This study completes the epidemiological results based on ESPS 2006 using a medico-economic analysis of associated data from health insurance claims data. This research programme was carried out thanks to a partnership with the National Institute for Public Health Surveillance (InVS), AstraZeneca and Novartis.

FURTHER INFORMATION

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