



Roche Nicolas¹, Nadif Rachel², Fabry-Vendrand Caroline³, Pillot Laura³, Thabut Gabriel³, Teissier Clément⁴, Bouée Stéphane⁴, Zins Marie⁵, Goldberg Marcel⁵

1. Service de Pneumologie, Hôpital Cochin, AHP Centre et Université de Paris, Paris, France, 2. Université Paris-Saclay, UVSQ, Univ. Paris-Sud, Inserm, Équipe d'Épidémiologie respiratoire intégrative, CESP, Villejuif, France, 3. AstraZeneca, Courbevoie, France, 4. Real World Evidence, CEMKA, Bourg La Reine, France, 5. Université Paris, UVSQ, Inserm, Cohortes Epidémiologiques en population, Villejuif, France

INTRODUCTION

Data on health care consumption and costs of asthma in the French population are scarce. CONSTANCES is a prospective general population cohort involving more than 200,000 volunteers which aims at providing epidemiological information on a vast variety of diseases.

OBJECTIVES

The objective of this study was to describe the burden of asthma in France according to GINA treatment steps.

METHODS

- Data (medical assessment & self-questionnaires) from participants included between 2012-2019 (n=162,725) were extracted and linked to the French claim and hospitalization database (SNDS) to obtain complete information on healthcare resources consumptions and costs.
- Participants were considered as current asthmatics if asthma was reported at inclusion and asthma symptoms and/or treatments were present at the 2019 inclusion/follow-up timepoint.
- Asthmatic participants were classified according to GINA treatments steps (no treatment, Step 1-2, Step 3-4 and Step 5).
- The results were compared with those of a group of never-asthmatic participants matched 1:1 with a propensity score based on age, sex, year of inclusion in the cohort, region of residence and EPICES score (a precariousness score).
- Healthcare resources consumption were collected from the SNDS for the year preceding the last self-questionnaire completed in 2019 and was valued from a societal perspective.

Table 1: Stepwise approach to control symptoms according to GINA 2017¹

	Step 1	Step 2	Step 3	Step 4	Step 5
Preferred controller		Low dose ICS	Low dose ICS LABA	Medium or High dose ICS LABA	Refer for add-on TRT (tiotropium, omalizumab, mepolizumab)
Other controller options	Consider low dose ICS	Leukotriene antagonists Low dose theophylline	Medium or High dose ICS Low dose ICS + LTRA (or theophylline)	Add tiotropium High dose ICS + LTRA (or + theophylline)	Add low dose OCS
Reliever	As needed SABA		As needed SABA or low dose ICS/formoterol		

ICS: inhaled corticosteroids; LABA: Long-acting beta 2 agonists; LTRA: Leukotriene receptor; OCS: oral corticosteroids; antagonists; SABA: Short-acting beta 2 agonists; TRT: treatment

RESULTS

Populations of analysis

- Answers on asthma diagnosis were available from patients and investigators in 162,725 participants. 6,948 asthmatics ("current asthma") were identified and matched with 6,948 never-asthmatic participants ("control group").
- Among the 6,948 asthmatics, 1,566 (22.5%) didn't receive any treatment and 165 couldn't be classified in a GINA step (atypical therapy).

Table 2: Demographic characteristics and BMI

	Control Group (n=6,783)	Current Asthma (n=6,783)	GINA 1 & 2 (n= 2,444 & 251)	GINA 3 & 4 (n= 1,054 & 1,315)	GINA 5 (n= 153)
Women	55.8%	55.4%	57.1%	54.1%	53.6%
Age, years (mean (SD))	44.6 (13.2)	45.2 (13.4)	42.3 (12.8)	49.0 (13.3)	56.4 (11.0)
BMI, kg/m ² (mean (SD))	24,7 (4.3)	25.7 (5.0)	25.5 (5.0)	26.3 (4.1)	27.8 (5.4)

Funding and conflict of interest

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Reference

1. GLOBAL INITIATIVE FOR ASTHMA. Global Strategy for Asthma Management and Prevention. Update August 2017. <http://ginasthma.org/download/317/>

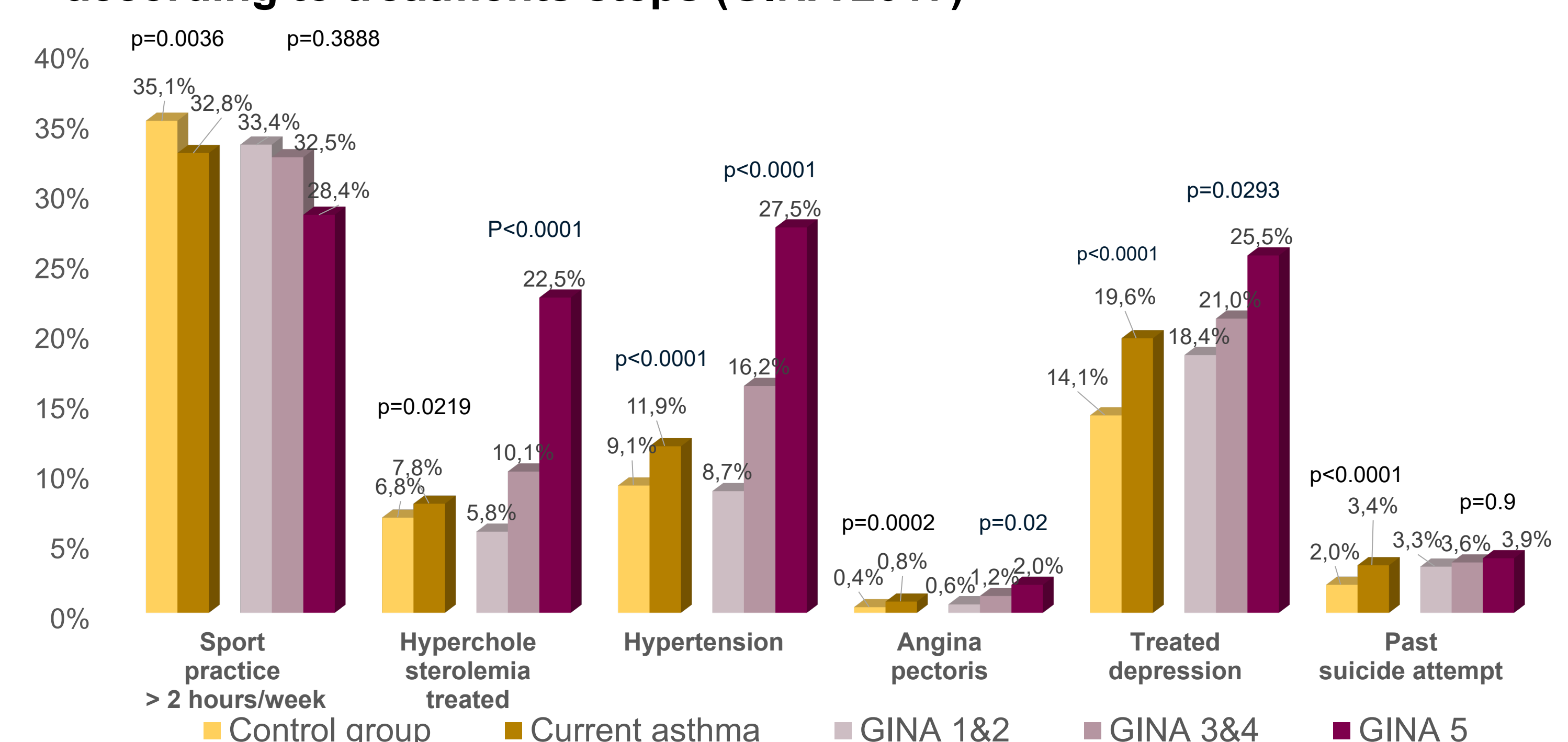
Symptoms

- The percentage of asthmatics woken up at night with breathing discomfort in the previous 12 months increased with the treatment step: from 44.1% for those in step 1 to 59.6% for those in step 5 (p <0.0001). In the control group of subject without asthma this percentage was 9.1% versus 44.1% for current asthma patients (p <0.0001).
- FEV1/FVC ratio was below 70% for 18.8% of current asthma patients and 4.5% in the control group (p<0.001). This percentage increased with the treatment step: 13.8% for steps 1&2, 26.7% for steps 3&4 and 47.9% for step 5.

Comorbidities

- The frequency of asthmatics with cardiovascular risk factors and co-morbidities, outpatient visits and hospitalizations increased with GINA treatment steps.

Figure 1: Comorbidities for asthmatics and control groups and according to treatments steps (GINA 2017)



Healthcare resources consumption and economic analysis

- Healthcare resources consumptions were higher for current asthma patients compared to control group and increased with treatment steps.
- Average total annual cost of ambulatory care was €2,644 for current asthma patients versus €1,887 for the control group (p<0,0001). This cost increased with treatment steps.

Figure 2: Healthcare resources consumption during one year for asthmatics and control groups and according to treatments steps (GINA 2017)

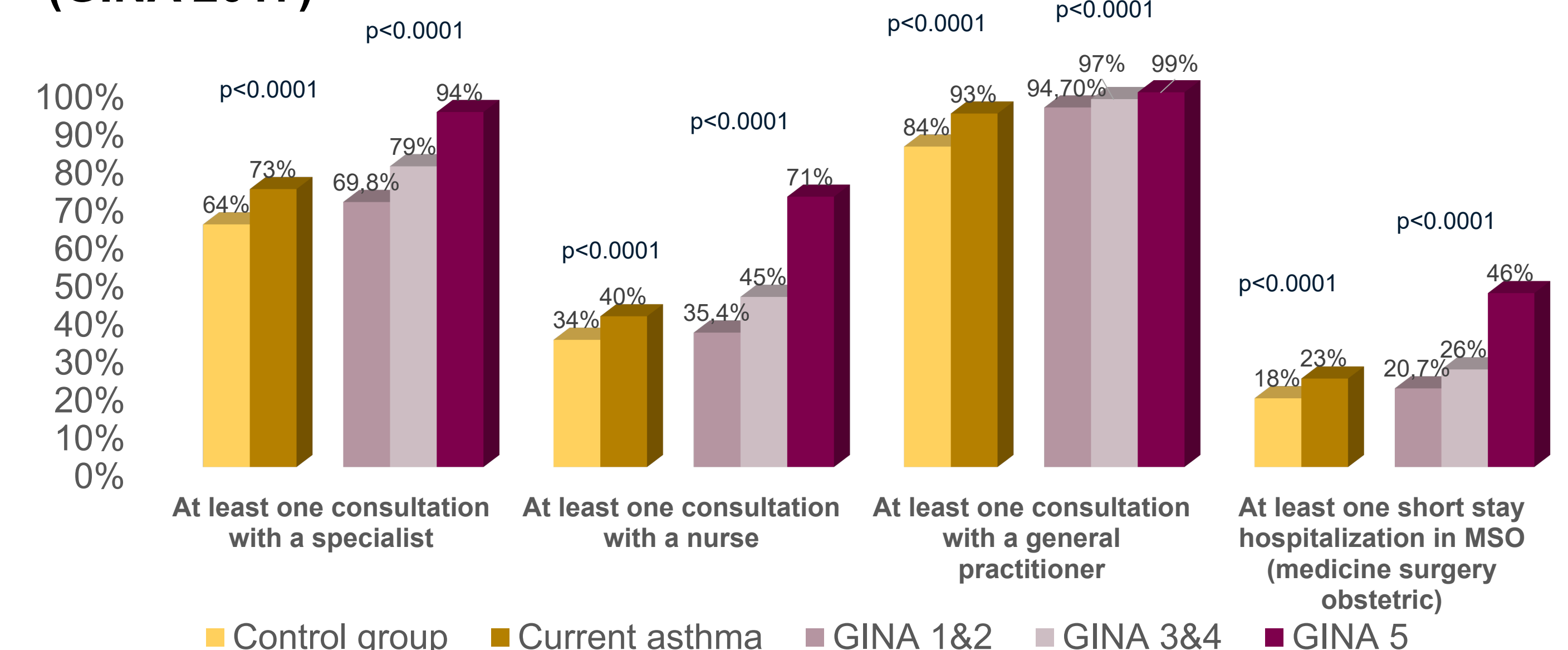


Table 3: Total mean cost/year/per participant for asthmatics and control groups and according to treatments steps (GINA 2017)

	Control Group (n=6,783)	Current Asthma (n=6,783)	GINA 1 & 2 (n= 2,444 & 251)	GINA 3 & 4 (n= 1,054 & 1,315)	GINA 5 (n= 153)
Medical fees	470	609	574	685	1,238
Dentist	140	151	138	172	250
Pharmacy	296	568	393	764	3187
Biologic exams	82	96	90.3	98.8	227.6
Paramedics	101	140	128	154	384
Medical devices	224	274	241	323	674
Transports	16	27	21	33	133
Other costs	47	61	59	66	160
Total cost (ambulatory care)	1376	1925	1647	2,296	6,252
Total cost (hospitalisations)	511	719	633	810	2,341
Total cost	1,887	2,644	2,280	3,106	8,593

CONCLUSION

The economic burden of asthma can be estimated at €757 per year and per patient on average in the population and increases with GINA treatment steps, as well as the burden of symptoms and comorbidities.