

## Online Supplements

**Rhinitis phenotypes and multimorbidities in the general population Constances cohort**

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## **Supplement on the method - CONSTANCES**

### **Assets**

Constances is a "general purpose" population-based epidemiological cohort. It is a nationally representative sample of 220,000 adults aged between 18 and 69 years at inclusion.

Due to its population size, the quality and diversity of data, and its monitoring methods, Constances is a unique epidemiological research tool. Constances, is a research platform broadly accessible to the scientific community that can be compared to the largest international cohorts.

Constances is also a public health tool, designed to support the public health objectives of the French National Health Insurance Fund for Employees (CNAMTS) and of the national government, owing to the collection of highly diverse data from multiple sources on a representative sample.

Constances is an epidemiological surveillance tool, implemented through a partnership with the French institute for public health surveillance. Its data covers multiple domains, such as the epidemiological surveillance of occupational hazards.

The Constances project, managed through the participation of French local health insurance funds and health clinics, is a partnership between INSERM, Versailles Saint Quentin University (UVSQ), the French national health insurance fund (CNAMTS), the French national retirement pension fund (Cnav) and the support of the French Ministry of health (Directorate general for health). Constances has received French government funding for an 8-year period (Investment for the Future Program).

### **Protocol**

The goal of the Constances project is to implement a large epidemiological cohort aimed at contributing to the development of epidemiological research and to provide public health information. The purpose of this cohort, created in the context of a partnership between the French national health insurance fund (CNAM) and the French national Old-Age insurance fund (Cnav), is to constitute an infrastructure open to the research community. Constances is labelled National Biology and Health Research Infrastructure by the French government's Commissariat-General for Investment.

Constances is a "general purpose" research infrastructure designed to help analysing a broad range of scientific problems. Constances was also designed as a public health and surveillance tool, thanks to the particularly exhaustive nature of the system for collecting and monitoring a great variety of data from a large representative sample of the adult population covered by the General Social Security scheme.

Random sampling: subjects considered as eligible due to their age and place of residence are drawn randomly by stratified sampling with unequal probabilities, over-representing individuals with a higher probability of non-volunteering according to age, gender and SES. Random sampling is performed by the Cnav from the French national inter-scheme registry of

health insurance beneficiaries (RNIAM), linked to the National careers management system (SNGC).

Data flow: the Constances cohort constitutes a complex database with characteristics rendering it highly sensitive under the terms of the French data protection act, in particular due to the collection of personal data. Moreover, some data collected at the individual level come from linkage to national databases: National inter-scheme health insurance information system (SNIIRAM), causes of death information system (CépiDc-INSERM) and the Cnav (Annual Social Security declarations, Named quarterly data, absenteeism due to illness, Active solidarity income, maternity). Very strict data collection, organisation, and management constraints are required. The procedures in place conform to legislative and regulatory texts intended to preserve high-level personal data confidentiality and security.

### **Confidentiality, safety and security approvals**

All confidentiality, safety and security procedures were approved by the French legal authorities (online supplement 1). Approvals were obtained from the National Data Protection Authority on March 3, 2011 (Commission Nationale de l'Informatique et des Libertés—CNIL, French National Data Protection Authority (authorisation no. 910486)), the National Council for Statistical Information (Conseil National de l'Information Statistique—CNIS), the National Medical Council (Conseil National de l'Ordre des Médecins—CNOM), and the Institutional Review Board of the National Institute for Medical Research-INSERM (authorisation no. 01-011). All participants signed a written informed consent.

### **Health check and questionnaires**

The invitation to participate to Constances implies to undergo a health examination in a health clinic. The randomly drawn individuals first receive at home an invitation letter presenting the project, along with a mail-back coupon enabling them to give their consent.

The persons having consented to participate in Constances are invited by letter to come to a health screening center (HSC), specifying the date and location of the examination. They also receive two self-questionnaires to be filled in at home: a health and lifestyle questionnaire, and a professional calendar tracing their full job history.

In addition to the self-questionnaire completed at home, subjects undergo a health examination used to collect health-related data: clinical examination, blood analysis, blood pressure, weight, height and waist-to-hip ratio, electrocardiogram and spirometry, sight and hearing examination. This examination is standardised by means of Standard Operating Procedures (SOPs) and permanent quality control is ensured in collaboration with the ClinSearch company and the Asqualab and Eurocell associations.

Additional questionnaires, to be completed on-site (whole-life occupational exposures, women's health), are collected at the health clinic. The informed consent signature validates the collection of these data and authorises their use for research purposes.

Participants aged 45 years and over are invited to undergo a cognitive and functional check-up. This examination is performed by a neuropsychologist and includes a series of tests. The documents pertaining to this check-up (protocol, data collection form), along with related videos, are available on request.

A yearly postal or Web-based self-questionnaire is used for active follow-up at the subjects' homes, and an invitation to come to an HSC once every 4 years is scheduled for all cohort participants.

Moreover, health and socio-professional data, along with causes of death, are regularly retrieved from the national health insurance, retirement pension fund and mortality databases.

More information on the full Constances' protocol is available here:

<https://www.constances.fr/assets/pdf/Scientific-protocol-01-2015.pdf>

For further information see the Constances website: [https://www.constances.fr/index\\_EN.php](https://www.constances.fr/index_EN.php)

## Rhinitis questionnaire

English translation of the rhinitis part of the 2014 annual follow-up questionnaire (available in French at: <https://www.constances.fr/S2014>)

Q.22: “During your lifetime, have you ever had any nasal allergies including hay fever?”  
Yes/No

Q.23: “During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?” Yes/No

If yes:

- Q23.A: “Did your eyes itch or cry when you had these nose problems?” Yes/No
- Q23.B: “How old were you the first time?” .... Years
- Q23.C: “Have you had these nose problems in the last 12 months?” Yes/No

Questions 24 to 29 ask about nose problems you have had in the last 12 months.

Q.24: “In which month did you have these nose problems? (several answers possible)”  
January, February, March, April, May, June, July, August, September, October, November, December

Q.25: “What factor triggered or increased these nose problems? (several answers possible)”  
Dust mites or house dust, Animals, Air pollution, Change in weather, Tobacco, Pollens, Cold air, Other, Unknown

Q.26: “Have you had these nose problems for more than 4 days in a week?” Yes/No

If yes

- Q.26.A: “Did these problems last more than 4 consecutive weeks?” Yes/No

Q27: “For each of the following problems, indicate whether you have had it in the last 12 months and whether it has been bothersome. If you have not been affected by any of them, indicate this in the first column of the table.”

	I had this problem but:		
	I didn't have this problem	It bothered me without affecting my daily activities or my sleep	It has bothered me and affected my daily activities or sleep
The nose that flows like water			
Blocked nose (feeling like you can't breathe through your nose)			
Itchy nose			
Sneezing that is particularly violent and occurs in attacks			
Eyes that cry, red, itchy			

Q.28: “Have you used nasal corticosteroid sprays to treat these nose problems? (Nasacort, Nasonex, Avamys, Rhinocort, Beconase, Beclometasone...)” Yes/No

Q.29: “Have you used any oral antihistamines/anti-allergic treatments to treat these nose problems? (Aerius, Xyzall, Clarityne, Kestin, Virlix, Zyrtec, Cetirizine, Loratadine, Desloratadine...)” Yes/No

## **Definitions of nasal allergies, rhinitis duration, rhinitis severity and reported symptoms**

Nasal allergies: based on the answer to the Q.22 “*During your lifetime, have you ever had any nasal allergies including hay fever?*”.

Rhinitis duration and severity were defined according to the Allergic Rhinitis and its Impact on Asthma (ARIA) recommendations.(1) Rhinitis was considered to be persistent if symptoms occur more than four days per week and more than four consecutive weeks (Q.26). Otherwise, the symptoms were considered intermittent. Rhinitis was considered to be moderate/severe if at least one of the symptoms of rhinitis (rhinorrhea, nasal congestion, nasal pruritus, sneezing) has been reported as a disturbing problem affecting daily activities and sleep (Q.27). Otherwise, rhinitis was considered to be mild if none of the symptoms have been reported as a disturbing problem affecting daily activities and sleep.

Reported symptoms (rhinorrhea, nasal congestion, nasal pruritus, sneezing, associated-eye symptoms): if in Q.27 participants reported having this problem.

### **Alternate definitions of rhinitis**

Alternate definition of ever-rhinitis: yes to: “*During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?*” or yes to: “*During your lifetime, have you ever had any nasal allergies including hay fever?*”.

Alternate definition of ever AR = definition based on adaptation of the ECRHS question on nasal allergies (2): yes to: “*During your lifetime, have you ever had any nasal allergies including hay fever?*”.

Alternate definition 1 of current AR and NAR = Triggers-based:

- Current AR: Yes to: “*Have you had these nose problems in the last 12 months?*” and answer *pollens* or *dust mites* or *house dust*, or *animal* to: “*what factor triggered or increased these nose problems? (several answers possible)*”.
- Current NAR: Yes to: “*Have you had these nose problems in the last 12 months?*” and no answer *pollens* or *dust mites* or *house dust*, or *animal* to: “*What factor triggered or increased these nose problems? (several answers possible)*”.

Alternate definition 2 of current AR = Classification tree-based: this definition was adapted from the classification tree obtained by Burte *et al.* with an unsupervised approach to identify rhinitis.(3)

- Current AR: Yes to: “*Have you had these nose problems in the last 12 months?*” and yes to: “*During your lifetime, have you ever had any nasal allergies including hay fever?*” or answer *pollens* to: “*What factor triggered or increased these nose problems? (several answers possible)*” and Yes to: “*Did your eyes itch or cry when you had these nose problems?*”.
- Current NAR: Yes to: “*Have you had these nose problems in the last 12 months?*” and no to: “*During your lifetime, have you ever had any nasal allergies including hay fever?*” and no answer *pollens* to: “*What factor triggered or increased these nose problems? (several answers possible)*” or no to: “*During your lifetime, have*

*you ever had any nasal allergies including hay fever?” and answer pollens to: “What factor triggered or increased these nose problems? (several answers possible)” and no to: “Did your eyes itch or cry when you had these nose problems?”.*

**References:**

1. Bousquet J, Khaltaev N, Cruz AA, *et al.* Allergic Rhinitis and its Impact on Asthma (ARIA) 2008\*. *Allergy* 2008; **63**: 8–160.
2. ECRHS. Variations in the prevalence of respiratory symptoms, self-reported asthma attacks, and use of asthma medication in the European Community Respiratory Health Survey (ECRHS). *European Respiratory Journal* 1996; **9**: 687–95.
3. Burte E, Bousquet J, Varraso R, *et al.* Characterization of Rhinitis According to the Asthma Status in Adults Using an Unsupervised Approach in the EGEA Study. *PLoS ONE* 2015; **10**: e0136191.

## **Supplement on the method – EGEA**

EGEA is a cohort study based on an initial group of asthma cases recruited in chest clinics from five French cities (1991-1995) along with their first-degree relatives, and a group of controls. Briefly, 2047 children (<16 years) and adult participants were enrolled at baseline, including 348 participants with current asthma from chest clinics, their 1244 first-degree relatives, and 415 population-based controls. The protocol and descriptive characteristics of the EGEA study have been previously published.(1,2)

A 12-year follow-up of the initial cohort was conducted between 2003 and 2007 (EGEA2). Among the alive cohort (n=2002), 92% (n=1845) completed a short self-administered questionnaire, and among them 1602 (n=1571 adults aged  $\geq 16$  years) had a complete examination. As a follow-up study of EGEA2, the third survey (EGEA3, 2011-2013, n=1558) was conducted using self-completed questionnaire only.

The EGEA collection was certified ISO 9001 from 2006 to 2018.(3) Ethical approval was obtained from the relevant institutional review board committees (Cochin Port-Royal Hospital and Necker-Enfants Malades Hospital, Paris). All participants signed a written informed consent.

### **Analysis population of the present paper**

The analyses of the present paper were performed at EGEA2. Among the 1571 adults, those with missing data regarding the definitions of rhinitis (n=13), or the presence of nasal allergies (n=29) were excluded from the analyses.

A total of 842 participants reported current rhinitis and were included in the analyses.

### **Variables of interest**

Current rhinitis was defined by a positive response to: "*Have you had problems with sneezing, runny nose or stuffy nose when you didn't have a cold or flu in the last 12 months?*". Among the participants with current rhinitis, participants who responded positively to "*Have you ever had allergic rhinitis?*" or "*Have you ever had hay fever?*" were classified as AR otherwise as NAR.

Participants with ever-asthma were defined by a positive answer to: "*Have you ever had attacks of breathlessness at rest with wheezing?*" or "*Have you ever had asthma attacks?*" or if they were recruited as asthmatic cases at the first survey.<sup>2</sup>

Ever-conjunctivitis: positive answer to "*Have you ever had allergic conjunctivitis?*". Age of onset: answer to "*At what age did you first experience these nose problems?*".

Reported triggers of the symptoms of rhinitis: answer to "*In the last 12 months, what factors have triggered or increased these nose problems? a. dust mites or house dust b. pollens c. animals d. other*". Several responses were possible, participants who did not provide any of the possible answers were categorized as "no trigger reported".

SPTs to 12 aeroallergens ((indoor: cat, *Dermatophagoides pteronyssinus*, *Blattella germanica*; outdoor: olive, birch, *Parietaria judaica*, timothy grass, ragweed pollen and *Cupressus*; moulds: *Aspergillus*, *Cladosporium herbarum*, *Alternaria tenuis*) were performed.

### **Alternate definition of AR and NAR**

We performed the description of allergic and non-allergic rhinitis defined by SPT in EGEA2. Current rhinitis was defined by a positive response to: "*Have you had problems with sneezing, runny nose or stuffy nose when you didn't have a cold or flu in the last 12 months?*". Among the participants with current rhinitis, those who had at least one positive SPT were classified as SPT-based AR (AR-SPT), otherwise as SPT-based NAR (NAR-SPT).

### **EGEA cooperative group:**

Coordination: V Siroux (epidemiology, PI since 2013); F Demenais (genetics); I Pin (clinical aspects); R Nadif (biology); F Kauffmann (PI 1992-2012). Respiratory epidemiology: *Inserm ex-U 700, Paris*: M Korobaëff (Egea1), F Neukirch (Egea1); *Inserm ex-U 707, Paris*: I Annesi-Maesano (Egea1-2); *Inserm U 1018, Villejuif*: O Dumas, F Kauffmann, N Le Moual, R Nadif, MP Orszczyn (Egea1-2), R Varraso; *Inserm U 1209 Grenoble*: J Lepeule, V Siroux. Genetics: *Inserm ex-U 393, Paris*: J Feingold; *Inserm UMR 1124, Paris*: E Bouzigon, MH Dizier, F Demenais; *CNG, Evry*: I Gut (now CNAG, Barcelona, Spain), M Lathrop (now Univ McGill, Montreal, Canada). Clinical centres: *Grenoble*: I Pin, C Pison; *Lyon*: D Ecochard (Egea1), F Gormand, Y Pacheco; *Marseille*: D Charpin (Egea1), D Vervloet (Egea1-2); *Montpellier*: J Bousquet; *Paris Cochin*: A Lockhart (Egea1), R Matran (now in Lille); *Paris Necker*: E Paty (Egea1-2), P Scheinmann (Egea1-2); *Paris-Trousseau*: A Grimfeld (Egea1-2), J Just. Data management and quality: *Inserm ex-U155, Paris*: J Hochez (Egea1); *Inserm U 1018, Villejuif*: N Le Moual, L Orsi; *Inserm ex-U780, Villejuif*: C Ravault (Egea1-2); *Inserm ex-U794, Evry*: N Chateigner (Egea1-2); *Inserm UMR 1124, Paris*: H Mohamdi; *Inserm U1209, Grenoble*: A Boudier, J Quentin (Egea1-2).

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### **References**

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hyperresponsiveness and atopy) – descriptive characteristics. Clin Exp Allergy. 1999 Dec;29 Suppl 4:17–21.

3. Nadif R, Bouzigon E, Le Moual N, Siroux V. EGEA Collection: A Biobank Devoted to Asthma and Asthma-related Phenotypes. Open Journal of Bioresources. 2017;4(1):5. DOI: <http://doi.org/10.5334/ojb.24>

**Table S1: Comparison between participants included and non-included in the analysis**

	<b>Non-included (n=5965)</b>	<b>Included (n=20772)</b>	<b>p value</b>
Sex			0.0001
Men	2836 (47.5%)	9297 (44.8%)	
Women	3129 (52.5%)	11475 (55.2%)	
Age at inclusion, years	48.4 (13.6)	51.0 (12.6)	<0.0001
Tobacco status at inclusion			<0.0001
Never-smoker	2326 (41.7%)	9395 (47.2%)	
Ex-smoker	1736 (31.1%)	7366 (37.0%)	
Current smoker	1521 (27.2%)	3126 (15.7%)	
Educational level at inclusion			<0.0001
Less than high school	974 (16.7%)	1938 (9.4%)	
High school	2283 (39.2%)	6755 (32.9%)	
University	2566 (44.1%)	11825 (57.6%)	
Body-mass index at inclusion, kg/m <sup>2</sup>			<0.0001
<18.5	162 (2.8%)	449 (2.2%)	
[18.5 - 25[	2879 (49.5%)	11164 (54.7%)	
[25 - 30[	1855 (31.9%)	6492 (31.8%)	
≥ 30	918 (15.8%)	2308 (11.3%)	
Asthma at inclusion			<0.0001
Never asthma	4955 (86.0%)	17911 (88.0%)	
Ever asthma	805 (14.0%)	2440 (12.0%)	
Ever rhinitis at inclusion			<0.0001
Never rhinitis	2982 (52.0%)	11202 (55.1%)	
Ever rhinitis	2748 (48.0%)	9130 (44.9%)	

Data are mean (SD) or n (%)

**Table S2: Prevalence of rhinitis according to different definitions**

	Definition	n/N	Crude Prevalence [CI 95%]
<b>Ever-rhinitis</b>			
Main definition	Yes to: “During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?”	11098/20772	53.4% [52.8% – 54.1%]
Alternate definition	- Yes to: “During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?” or - Yes to: “During your lifetime, have you ever had any nasal allergies including hay fever?”	12207/20772	58.8% [58.1% – 59.4%]
<b>Ever AR</b>			
Main definition	- Yes to: “During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?” and - Yes to: “During your lifetime, have you ever had any nasal allergies including hay fever?”	7589/20772	36.5% [35.9% – 37.2%]
Alternate definition	Yes to: “During your lifetime, have you ever had any nasal allergies including hay fever?”	8698/20772	41.9% [41.2% - 42.5%]
<b>Ever NAR</b>			
Main definition	- Yes to: “During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?” and - No to: “During your lifetime, have you ever had any nasal allergies including hay fever?”	3509/20772	16.9% [16.4% – 17.4%]
<b>Current rhinitis</b>			
Main definition	Yes to: “Have you had these nose problems in the last 12 months?”	8069/20772	38.9% [38.2% – 39.5%]
<b>Current AR</b>			
Main definition	- Yes to: “Have you had these nose problems in the last 12 months?” and - Yes to: “During your lifetime, have you ever had any nasal allergies including hay fever?”	5806/20772	28.0% [27.3% – 28.6%]
Alternate definition 1	- Yes to: “Have you had these nose problems in the last 12 months?” and - Answer pollens or dust mites or house dust or animal to: “What factor triggered or increased these nose problems? (several answers possible)”	4208/20772	20.3% [19.7% – 20.8%]
Alternate definition 2	- Yes to: “Have you had these nose problems in the last 12 months?” and - Yes to: “During your lifetime, have you ever had any nasal allergies including hay fever?” or - Answer pollens to: “What factor triggered or increased these nose problems? (several answers possible)” and Yes to: “Did your eyes itch or cry when you had these nose problems?”	5858/20627	28.4% [27.8% – 29.0%]
<b>Current NAR</b>			
Main definition	- Yes to: “Have you had these nose problems in the last 12 months?” and - No to: “During your lifetime, have you ever had any nasal allergies including hay fever?”	2263/20772	10.9% [10.5% – 11.3%]
Alternate definition 1 = Triggers-based	- Yes to: “Have you had these nose problems in the last 12 months?” and - No answer pollens or dust mites or house dust or animal to: “What factor triggered or increased these nose problems? (several answers possible)”	3861/20772	18.6% [18.1% - 19.1%]
Alternate definition 2 = Classification tree-based	- Yes to: “Have you had these nose problems in the last 12 months?” and - No to: “During your lifetime, have you ever had any nasal allergies including hay fever?” and no answer pollens to: “What factor triggered or increased these nose problems? (several answers possible)” or - No to: “During your lifetime, have you ever had any nasal allergies including hay fever?” and answer pollens to: “What factor triggered or increased these nose problems? (several answers possible)” and no to: “Did your eyes itch or cry when you had these nose problems?”	2066/20627	10.0% [9.6% - 10.4%]
n/N:	number of cases/Total number of participants,	CI 95%:	Confidence Interval 95%

**Table S3: Comparison of participants with current Allergic Rhinitis (AR) and current Non-Allergic Rhinitis (NAR) according to alternate definitions**

	Main definition			Alternate definition 1: Triggers-based			Alternate definition 2: Classification tree-based		
	AR (n=5806)	NAR (n=2263)	p value	AR (n=4208)	NAR (n=3861)	p value	AR (n=5858)	NAR (n=2066)	p value
Sex			0.072			0.14			0.0056
Men	2468 (42.5%)	1012 (44.7%)		1782 (42.3%)	1698 (44.0%)		2471 (42.2%)	944 (45.7%)	
Women	3338 (57.5%)	1251 (55.3%)		2426 (57.7%)	2163 (56.0%)		3387 (57.8%)	1122 (54.3%)	
Age, years	51.7 (12.8)	52.4 (13.3)	0.032	49.5 (12.9)	54.5 (12.5)	<0.0001	51.5 (12.8)	52.5 (13.3)	0.0029
Tobacco status			0.0044			<0.0001			0.0059
Never-smoker	2534 (46.0%)	954 (44.3%)		1942 (48.5%)	1546 (42.2%)		2568 (46.2%)	870 (44.3%)	
Ex-smoker	2289 (41.5%)	870 (40.4%)		1580 (39.5%)	1579 (43.1%)		2299 (41.3%)	794 (40.4%)	
Current smoker	688 (12.5%)	330 (15.3%)		483 (12.1%)	535 (14.6%)		697 (12.5%)	302 (15.4%)	
Educational level			0.77			<0.0001			0.53
Less than high school	495 (8.6%)	200 (8.9%)		321 (7.7%)	374 (9.8%)		502 (8.7%)	183 (9.0%)	
High school	1717 (29.9%)	681 (30.4%)		1164 (28.0%)	1234 (32.3%)		1721 (29.7%)	630 (30.8%)	
University	3528 (61.5%)	1356 (60.6%)		2675 (64.3%)	2209 (57.9%)		3570 (61.6%)	1231 (60.2%)	
Body-mass index, kg/m <sup>2</sup>			0.34			0.094			0.089
<18.5	124 (2.2%)	48 (2.2%)		99 (2.4%)	73 (1.9%)		122 (2.1%)	43 (2.1%)	
[18.5 - 25[	3264 (57.5%)	1309 (59.0%)		2429 (58.9%)	2144 (56.9%)		3284 (57.3%)	1214 (60.0%)	
[25 - 30[	1690 (29.8%)	657 (29.6%)		1194 (28.9%)	1153 (30.6%)		1713 (29.9%)	585 (28.9%)	
≥ 30	599 (10.6%)	205 (9.2%)		404 (9.8%)	400 (10.6%)		612 (10.7%)	182 (9.0%)	
Asthma			<0.0001			<0.0001			<0.0001
Never asthma	4304 (75.7%)	2056 (92.5%)		2959 (71.8%)	3401 (89.9%)		4347 (75.8%)	1889 (93.1%)	
Ever asthma	1383 (24.3%)	166 (7.5%)		1165 (28.2%)	384 (10.1%)		1388 (24.2%)	141 (6.9%)	
Conjunctivitis			<0.0001			<0.0001			<0.0001
Never conjunctivitis	2317 (44.7%)	1652 (80.4%)		1628 (42.1%)	2341 (69.4%)		2369 (45.1%)	1532 (81.8%)	
Ever conjunctivitis	2868 (55.3%)	402 (19.6%)		2236 (57.9%)	1034 (30.6%)		2885 (54.9%)	342 (18.2%)	
Eczema			<0.0001			<0.0001			<0.0001
Never eczema	3021 (59.2%)	1561 (74.5%)		2202 (58.4%)	2380 (69.5%)		3078 (59.6%)	1436 (74.9%)	
Ever eczema	2081 (40.8%)	535 (25.5%)		1571 (41.6%)	1045 (30.5%)		2088 (40.4%)	481 (25.1%)	
Nasal allergies			<0.0001			<0.0001			<0.0001
Never nasal allergies	0 (0.0%)	2263 (100.0%)		439 (10.4%)	1824 (47.2%)		139 (2.4%)	2066 (100.0%)	
Ever nasal allergies	5806 (100.0%)	0 (0.0%)		3769 (89.6%)	2037 (52.8%)		5719 (97.6%)	0 (0.0%)	
Eosinophils count, cell/mm <sup>3</sup>	208.6 (146.4)	177.3 (117.9)	<0.0001	212.1 (147.6)	186.3 (129.0)	<0.0001	207.9 (146.1)	176.2 (116.4)	<0.0001
Age of onset of rhinitis, year	24.3 (15.3)	34.6 (17.5)	<0.0001	23.1 (14.7)	31.9 (17.5)	<0.0001	24.5 (15.4)	34.5 (17.7)	<0.0001
Reported triggers of rhinitis symptoms <sup>†</sup>									
Dust mites or house dust	1937 (33.4%)	235 (10.4%)	<0.0001	2172 (51.6%)	0 (0.0%)	<0.0001	1946 (33.2%)	198 (9.6%)	<0.0001
Animals	677 (11.7%)	55 (2.4%)	<0.0001	732 (17.4%)	0 (0.0%)	<0.0001	675 (11.5%)	48 (2.3%)	<0.0001

	Main definition			Alternate definition 1: Triggers-based			Alternate definition 2: Classification tree-based		
	AR (n=5806)	NAR (n=2263)	p value	AR (n=4208)	NAR (n=3861)	p value	AR (n=5858)	NAR (n=2066)	p value
Air pollution	1560 (26.9%)	287 (12.7%)	<0.0001	1361 (32.3%)	486 (12.6%)	<0.0001	1590 (27.1%)	235 (11.4%)	<0.0001
Change in weather	1677 (28.9%)	601 (26.6%)	0.037	1240 (29.5%)	1038 (26.9%)	0.010	1689 (28.8%)	546 (26.4%)	0.037
Tobacco	359 (6.2%)	93 (4.1%)	0.0003	315 (7.5%)	137 (3.5%)	<0.0001	356 (6.1%)	86 (4.2%)	0.0011
Pollens	3035 (52.3%)	231 (10.2%)	<0.0001	3266 (77.6%)	0 (0.0%)	<0.0001	3144 (53.7%)	88 (4.3%)	<0.0001
Cold air	1423 (24.5%)	627 (27.7%)	0.0030	1055 (25.1%)	995 (25.8%)	0.47	1433 (24.5%)	585 (28.3%)	0.0005
Other	735 (12.7%)	282 (12.5%)	0.81	478 (11.4%)	539 (14.0%)	0.0004	733 (12.5%)	267 (12.9%)	0.63
Unknown	1573 (27.1%)	1100 (48.6%)	<0.0001	410 (9.7%)	2263 (58.6%)	<0.0001	1562 (26.7%)	1051 (50.9%)	<0.0001
Reported symptoms†									
Rhinorrhoea	4051 (75.1%)	1215 (59.0%)	<0.0001	2969 (74.9%)	2297 (65.9%)	<0.0001	4084 (74.9%)	1111 (59.0%)	<0.0001
Nasal congestion/obstruction	4000 (76.3%)	1257 (62.1%)	<0.0001	2886 (75.0%)	2371 (69.3%)	<0.0001	4019 (75.9%)	1148 (61.9%)	<0.0001
Nasal itching	3445 (67.0%)	767 (39.7%)	<0.0001	2696 (70.4%)	1516 (46.7%)	<0.0001	3476 (66.9%)	670 (37.9%)	<0.0001
Sneezing	4073 (75.9%)	1055 (52.2%)	<0.0001	3098 (78.1%)	2030 (59.3%)	<0.0001	4104 (75.6%)	958 (51.7%)	<0.0001
Associated-eye symptoms	3693 (68.8%)	698 (35.3%)	<0.0001	2943 (73.9%)	1448 (43.0%)	<0.0001	3768 (69.4%)	574 (31.7%)	<0.0001
Number of reported symptoms	3.6 (1.3)	2.3 (1.3)	<0.0001	3.7 (1.2)	2.7 (1.4)	<0.0001	3.5 (1.3)	2.3 (1.3)	<0.0001
Rhinitis severity			<0.0001			<0.0001			<0.0001
Mild	2862 (59.9%)	1391 (75.8%)		2132 (59.7%)	2121 (69.8%)		2902 (60.0%)	1286 (76.3%)	
Moderate/severe	1913 (40.1%)	445 (24.2%)		1441 (40.3%)	917 (30.2%)		1938 (40.0%)	399 (23.7%)	
Rhinitis duration			<0.0001			0.11			<0.0001
Intermittent	3798 (68.4%)	1624 (74.9%)		2884 (71.0%)	2538 (69.3%)		3863 (68.8%)	1465 (73.9%)	
Persistent	1758 (31.6%)	544 (25.1%)		1179 (29.0%)	1123 (30.7%)		1750 (31.2%)	518 (26.1%)	
Rhinitis treatment			<0.0001			<0.0001			<0.0001
Neither oral antihistamines nor intranasal corticoids	1911 (34.1%)	1596 (73.5%)		1255 (30.7%)	2252 (61.1%)		1954 (34.5%)	1484 (74.7%)	
Oral antihistamines only	1204 (21.5%)	118 (5.4%)		1022 (25.0%)	300 (8.1%)		1204 (21.3%)	95 (4.8%)	
Intranasal corticoids only	700 (12.5%)	325 (15.0%)		376 (9.2%)	649 (17.6%)		705 (12.4%)	304 (15.3%)	
Oral antihistamines and intranasal corticoids	1794 (32.0%)	131 (6.0%)		1439 (35.2%)	486 (13.2%)		1802 (31.8%)	104 (5.2%)	

Data are mean (SD) or n (%), †: several possible answers

Current rhinitis: Yes to Q.23 “During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?”

AR Main definition: current rhinitis and Yes to Q.22: “During your lifetime, have you ever had any nasal allergies including hay fever?”

NAR Main definition: current rhinitis and No to Q.22: “During your lifetime, have you ever had any nasal allergies including hay fever?”

AR Alternate Definition 1: current rhinitis and answer pollens or dust mites or house dust or animal to Q.25: “What factor triggered or increased these nose problems? (several answers possible)”

NAR Alternate Definition 1: current rhinitis and no answer pollens and dust mites and house dust and animal to Q.25: “What factor triggered or increased these nose problems? (several answers possible)”

AR Alternate Definition 2: current rhinitis and Yes to Q.22: “During your lifetime, have you ever had any nasal allergies including hay fever?” or Answer pollens to Q.25: “What factor triggered or increased these nose problems? (several answers possible)” and Yes to Q.23.A “Did your eyes itch or cry when you had these nose problems?”

NAR Alternate Definition 2: current rhinitis and No to Q.22: “During your lifetime, have you ever had any nasal allergies including hay fever?” or no to Q.23.A “Did your eyes itch or cry when you had these nose problems?”

Kappa concordance coefficient between the main definition and the alternate definition 1 = 0.37

Kappa concordance coefficient between the main definition and the alternate definition 2 = 0.96

**Table S4: Characteristics of participants with current Allergic Rhinitis (AR) or current Non-Allergic Rhinitis (NAR) including ever-asthma status in EGEA**

	AR			NAR		
	Never asthma (n=174)	Ever asthma (n=380)	p-value	Never asthma (n=176)	Ever asthma (n=83)	p-value
Sex			0.49			0.01
Men	81 (46.6%)	189 (49.7%)		68 (38.6%)	46 (55.4%)	
Women	93 (53.5%)	191 (50.3%)		108 (61.4%)	37 (44.6%)	
Age, years	44.7 (15.4)	38.4 (15.8)	<0.0001	48.3 (15.2)	37.2 (17.3)	<0.0001
Tobacco status			0.23			0.01
Never-smoker	85 (48.9%)	189 (49.9%)		90 (51.1%)	51 (61.5%)	
Ex-smoker	50 (28.7%)	86 (22.7%)		51 (29.0%)	10 (12.1%)	
Current smoker	39 (22.4%)	104 (27.4%)		35 (19.9%)	22 (26.5%)	
Educational level			0.12			0.25
Less than high school	35 (21.0%)	62 (17.3%)		51 (30.2%)	19 (23.2%)	
High school	43 (25.8%)	124 (34.5%)		44 (26.0%)	18 (22.0%)	
University	89 (53.3%)	173 (48.2%)		74 (43.8%)	45 (54.9%)	
Conjunctivitis			0.04			0.80
Never conjunctivitis	92 (53.8%)	166 (44.2%)		134 (77.0%)	62 (78.5%)	
Ever conjunctivitis	79 (46.2%)	210 (55.9%)		40 (23.0%)	17 (21.5%)	
Eczema			0.0003			0.02
Never eczema	110 (64.0%)	178 (47.2%)		130 (74.3%)	49 (59.8%)	
Ever eczema	62 (36.1%)	199 (52.8%)		45 (25.7%)	33 (40.2%)	
All SPTs			0.0006			<.0001
No positive SPT	45 (29.2%)	53 (15.8%)		110 (77.5%)	27 (41.5%)	
At least one positive SPT	109 (70.8%)	282 (84.2%)		32 (22.5%)	38 (58.5%)	
Indoor SPTs			<.0001			<.0001
No positive SPT	80 (52.0%)	108 (32.2%)		119 (83.8%)	31 (47.7%)	
At least one positive SPT	74 (48.1%)	227 (67.8%)		23 (16.2%)	34 (52.3%)	
Mould SPTs			0.19			0.01
No positive SPT	130 (84.4%)	266 (79.4%)		136 (95.8%)	56 (86.2%)	
At least one positive SPT	24 (15.6%)	69 (20.6%)		6 (4.2%)	9 (13.9%)	
Outdoor SPTs			0.03			<.0001
No positive SPT	69 (44.8%)	115 (34.3%)		125 (88.0%)	36 (55.4%)	
At least one positive SPT	85 (55.2%)	220 (65.7%)		17 (12.0%)	29 (44.6%)	
Number of positive SPTs	1.9 (1.8)	2.6 (1.9)	<.0001	0.4 (0.9)	1.6 (1.6)	<.0001
Immunoglobulin E, IU/ml	82.3 (34.5-201.0)	160.2 (68.7-385.0)	<.0001	43.4 (15.4-105.0)	119.4 (32.1-350.0)	<.0001
Blood eosinophils count, cell/mm <sup>3</sup>	191.6 (125.5)	260.1 (200.6)	<.0001	170.7 (143.9)	262.0 (208.6)	0.001
Age of onset of rhinitis, year	24.9 (15.8)	14.3 (12.3)	<.0001	34.4 (17.9)	20.9 (18.4)	<.0001
Reported triggers of rhinitis symptoms†						
Dust mites or house dust	57 (32.8%)	206 (54.2%)	<.0001	40 (22.7%)	29 (34.9%)	0.04
Animals	29 (16.7%)	133 (35.0%)	<.0001	5 (2.8%)	12 (14.5%)	0.0004
Pollens	121 (69.5%)	250 (65.8%)	0.38	37 (21.0%)	13 (15.7%)	0.31
Other	20 (11.5%)	33 (8.7%)	0.30	55 (31.3%)	19 (22.9%)	0.16
No trigger reported	12 (6.9%)	25 (6.6%)	0.89	54 (30.7%)	23 (27.7%)	0.63
Reported symptoms†				0 (0.0%)		
Rhinorrhoea	114 (72.2%)	288 (81.4%)	0.02	67 (46.5%)	39 (52.0%)	0.44
Sneezing	141 (87.0%)	315 (88.0%)	0.76	104 (68.4%)	48 (63.2%)	0.43
Associated-eye symptoms	135 (86.0%)	289 (80.5%)	0.13	92 (60.1%)	47 (59.5%)	0.93
Impairment in daily activities			0.01			0.002
None	86 (49.4%)	155 (40.8%)		139 (79.0%)	48 (57.8%)	
A little	61 (35.1%)	123 (32.4%)		27 (15.3%)	21 (25.3%)	
Moderate	22 (12.6%)	68 (17.9%)		8 (4.6%)	9 (10.8%)	
A lot	5 (2.9%)	34 (9.0%)		2 (1.1%)	5 (6.0%)	
Duration			0.10			0.45
<1 month/year	70 (40.5%)	116 (30.6%)		87 (49.7%)	38 (45.8%)	
>1 month/year and <4 days/week	47 (27.2%)	117 (30.9%)		30 (17.1%)	17 (20.5%)	
>1 month/year and >4 days/week	56 (32.4%)	143 (37.7%)		58 (33.1%)	27 (32.5%)	

Data are mean (SD) or geometric mean (quartile 1 – quartile 3) or n (%), †: several possible answers, all SPTs: skin prick tests to 12 aeroallergens: indoor: cat, *Dermatophagoides pteronyssinus*, *Blattella germanica*; outdoor: olive, birch, *Parietaria judaica*, timothy grass, ragweed pollen and *Cupressus*; moulds: *Aspergillus*, *Cladosporium herbarum*, *Alternaria tenuis*

**Table S5: Characteristics of participants with current allergic rhinitis (AR) or current non-allergic rhinitis (NAR) defined by SPTs and including ever-asthma status in EGEA**

	AR-SPT			NAR-SPT		
	Never asthma (n=141)	Ever asthma (n=320)	p-value	Never asthma (n=155)	Ever asthma (n=80)	p-value
Sex			0.02			0.56
Men	60 (42.6%)	175 (54.7%)		56 (36.1%)	32 (40.0%)	
Women	81 (57.5%)	145 (45.3%)		99 (63.9%)	48 (60.0%)	
Age, years	40.6 (14.3)	35.9 (15.1)	0.002	51.3 (14.8)	47.9 (16.7)	0.11
Tobacco status			0.45			0.46
Never-smoker	72 (51.1%)	171 (53.4%)		78 (50.3%)	37 (46.3%)	
Ex-smoker	34 (24.1%)	61 (19.1%)		49 (31.6%)	23 (28.8%)	
Current smoker	35 (24.8%)	88 (27.5%)		28 (18.1%)	20 (25.0%)	
Educational level			0.11			0.98
Less than high school	21 (14.9%)	46 (14.5%)		50 (32.3%)	25 (31.3%)	
High school	34 (24.1%)	107 (33.8%)		41 (26.5%)	21 (26.3%)	
University	86 (61.0%)	164 (51.7%)		64 (41.3%)	34 (42.5%)	
Conjunctivitis			0.05			0.06
Never conjunctivitis	76 (55.1%)	143 (45.3%)		110 (71.9%)	46 (59.7%)	
Ever conjunctivitis	62 (44.9%)	173 (54.8%)		43 (28.1%)	31 (40.3%)	
Eczema			<.0001			0.99
Never eczema	98 (70.0%)	143 (45.0%)		100 (64.9%)	52 (65.0%)	
Ever eczema	42 (30.0%)	175 (55.0%)		54 (35.1%)	28 (35.0%)	
Indoor SPTs			0.002			-
No positive SPT	44 (31.2%)	59 (18.4%)		-	-	
At least one positive SPT	97 (68.8%)	261 (81.6%)		-	-	
Mould SPTs			0.47			-
No positive SPT	111 (78.7%)	242 (75.6%)		-	-	
At least one positive SPT	30 (21.3%)	78 (24.4%)		-	-	
Outdoor SPTs			0.20			-
No positive SPT	39 (27.7%)	71 (22.2%)		-	-	
At least one positive SPT	102 (72.3%)	249 (77.8%)		-	-	
Number of positive SPTs	2.4 (1.6)	3.0 (1.6)	0.0004	-	-	-
Immunoglobulin E, IU/ml	95.8 (46.7-209.0)	197.1 (86.1-451.0)	<.0001	40.5 (15.4-91.3)	49.8 (16.7-138.0)	0.32
Blood eosinophils count, cell/mm <sup>3</sup>	198.0 (130.5)	259.6 (191.9)	0.0006	170.1 (140.1)	229.9 (212.3)	0.03
Age of onset of rhinitis, year	21.7 (13.1)	13.3 (11.9)	<.0001	36.1 (18.3)	24.3 (16.6)	<.0001
Reported triggers of rhinitis symptoms†						
Dust mites or house dust	53 (37.6%)	182 (56.9%)	0.0001	32 (20.7%)	24 (30.0%)	0.11
Animals	26 (18.4%)	124 (38.8%)	<.0001	4 (2.6%)	3 (3.8%)	0.62
Pollens	96 (68.1%)	208 (65.0%)	0.52	42 (27.1%)	25 (31.3%)	0.50
Other	13 (9.2%)	25 (7.8%)	0.61	49 (31.6%)	17 (21.3%)	0.09
No trigger reported	7 (5.0%)	17 (5.3%)	0.88	45 (29.0%)	22 (27.5%)	0.81
Reported symptoms†						
Rhinorrhoea	95 (70.4%)	241 (78.8%)	0.06	66 (50.4%)	47 (67.1%)	0.02
Sneezing	123 (88.5%)	264 (85.4%)	0.38	98 (70.0%)	50 (71.4%)	0.83
Associated-eye symptoms	112 (83.6%)	248 (80.5%)	0.45	88 (63.3%)	49 (65.3%)	0.77
Impairment in daily activities			0.009			0.001
None	75 (53.2%)	141 (44.1%)		113 (72.9%)	38 (47.5%)	
A little	47 (33.3%)	98 (30.6%)		27 (17.4%)	23 (28.8%)	
Moderate	17 (12.1%)	52 (16.3%)		11 (7.1%)	13 (16.3%)	
A lot	2 (1.4%)	29 (9.1%)		4 (2.6%)	6 (7.5%)	
Duration			0.05			0.25
<1 month/year	64 (45.7%)	108 (33.8%)		72 (46.8%)	28 (35.4%)	
>1 month/year and <4 days/week	32 (22.9%)	91 (28.4%)		35 (22.7%)	23 (29.1%)	
>1 month/year and >4 days/week	44 (31.4%)	121 (37.8%)		47 (30.5%)	28 (35.4%)	

Data are mean (SD) or geometric mean (quartile 1 – quartile 3) or n (%), † : several possible answers, all SPTs : skin prick tests to 12 aeroallergens : indoor : cat, *Dermatophagoides pteronyssinus*, *Blattella germanica* ; outdoor : olive, birch, *Parietaria judaica*, timothy grass, ragweed pollen and *Cupressus* ; moulds : *Aspergillus*, *Cladosporium herbarum*, *Alternaria tenuis*

**Table S6: Characteristics of participants with current Allergic Rhinitis (AR) including ever-asthma (A) and ever-conjunctivitis (C) status in EGEA**

	AR alone (n=92)	AR and C (n=79)	AR and A (n=166)	AR and C and A (n=210)	p- value
Sex					0.39
Men	48 (52.2%)	32 (40.5%)	85 (51.2%)	102 (48.6%)	
Women	44 (47.8%)	47 (59.5%)	81 (48.8%)	108 (51.4%)	
Age, years	43.9 (16.2)	45.5 (14.8)	36.4 (15.4)	40.1 (16.0)	<0.0001
Tobacco status					0.37
Never-smoker	40 (43.5%)	44 (55.7%)	78 (47.0%)	111 (53.1%)	
Ex-smoker	29 (31.5%)	19 (24.1%)	40 (24.1%)	44 (21.1%)	
Current smoker	23 (25.0%)	16 (20.3%)	48 (28.9%)	54 (25.8%)	
Educational level					0.07
Less than high school	20 (23.0%)	15 (19.5%)	33 (21.4%)	28 (13.9%)	
High school	24 (27.6%)	18 (23.4%)	58 (37.7%)	66 (32.8%)	
University	43 (49.4%)	44 (57.1%)	63 (40.9%)	107 (53.2%)	
Eczema					0.001
Never eczema	58 (64.4%)	49 (62.0%)	87 (53.4%)	90 (42.9%)	
Ever eczema	32 (35.6%)	30 (38.0%)	76 (46.6%)	120 (57.1%)	
All SPTs					0.003
No positive SPT	25 (30.9%)	20 (28.6%)	26 (18.2%)	26 (13.8%)	
At least one positive SPT	56 (69.1%)	50 (71.4%)	117 (81.8%)	162 (86.2%)	
Indoor SPTs					<.0001
No positive SPT	46 (56.8%)	34 (48.6%)	41 (28.7%)	65 (34.6%)	
At least one positive SPT	35 (43.2%)	36 (51.4%)	102 (71.3%)	123 (65.4%)	
Mould SPTs					0.63
No positive SPT	69 (85.2%)	59 (84.3%)	114 (79.7%)	150 (79.8%)	
At least one positive SPT	12 (14.8%)	11 (15.7%)	29 (20.3%)	38 (20.2%)	
Outdoor SPTs					0.01
No positive SPT	35 (43.2%)	32 (45.7%)	60 (42.0%)	52 (27.7%)	
At least one positive SPT	46 (56.8%)	38 (54.3%)	83 (58.0%)	136 (72.3%)	
Number of positive SPTs	1.6 (1.6)	2.1 (2.1)	2.4 (1.9)	2.7 (1.8)	0.0002
Immunoglobulin E, IU/ml	79.2 (30.9-196.0)	86.9 (36.3-209.0)	162.9 (67.8-394.0)	157.5 (68.9-351.3)	<.0001
Blood eosinophils count, cell/mm <sup>3</sup>	179.6 (128.3)	206.7 (122.0)	260.2 (184.4)	259.9 (213.7)	0.001
Age of onset of rhinitis, year	23.1 (15.5)	27.2 (15.9)	14.9 (12.8)	13.6 (11.9)	<.0001
Reported triggers of rhinitis symptoms†					
Dust mites or house dust	28 (30.4%)	27 (34.2%)	95 (57.2%)	111 (52.9%)	<.0001
Animals	14 (15.2%)	15 (19.0%)	48 (28.9%)	84 (40.0%)	<.0001
Pollens	67 (72.8%)	53 (67.1%)	93 (56.0%)	155 (73.8%)	0.002
Other	8 (8.7%)	11 (13.9%)	18 (10.8%)	15 (7.1%)	0.31
No trigger reported	6 (6.5%)	6 (7.6%)	12 (7.2%)	12 (5.7%)	0.92
Reported symptoms†					
Rhinorrhoea	62 (73.8%)	50 (70.4%)	121 (77.1%)	163 (84.5%)	0.04
Sneezing	76 (88.4%)	63 (86.3%)	138 (87.3%)	173 (88.3%)	0.97
Associated-eye symptoms	69 (83.1%)	63 (88.7%)	112 (71.8%)	173 (86.9%)	0.001
Impairment in daily activities					0.005
None	53 (57.6%)	32 (40.5%)	80 (48.2%)	75 (35.7%)	
A little	25 (27.2%)	35 (44.3%)	47 (28.3%)	73 (34.8%)	
Moderate	12 (13.0%)	9 (11.4%)	27 (16.3%)	40 (19.1%)	
A lot	2 (2.2%)	3 (3.8%)	12 (7.2%)	22 (10.5%)	
Duration					0.01
<1 month/year	43 (47.3%)	27 (34.2%)	61 (37.0%)	55 (26.2%)	
>1 month/year and <4 days/week	26 (28.6%)	19 (24.1%)	49 (29.7%)	67 (31.9%)	
>1 month/year and >4 days/week	22 (24.2%)	33 (41.8%)	55 (33.3%)	85 (40.5%)	

Data are mean (SD) or n (%), †: several possible answers, all SPTs: skin prick tests to 12 aeroallergens: indoor: cat, *Dermatophagoides pteronyssinus*, *Blattella germanica*; outdoor: olive, birch, *Parietaria judaica*, timothy grass, ragweed pollen and *Cupressus*; moulds: *Aspergillus*, *Cladosporium herbarum*, *Alternaria tenuis*

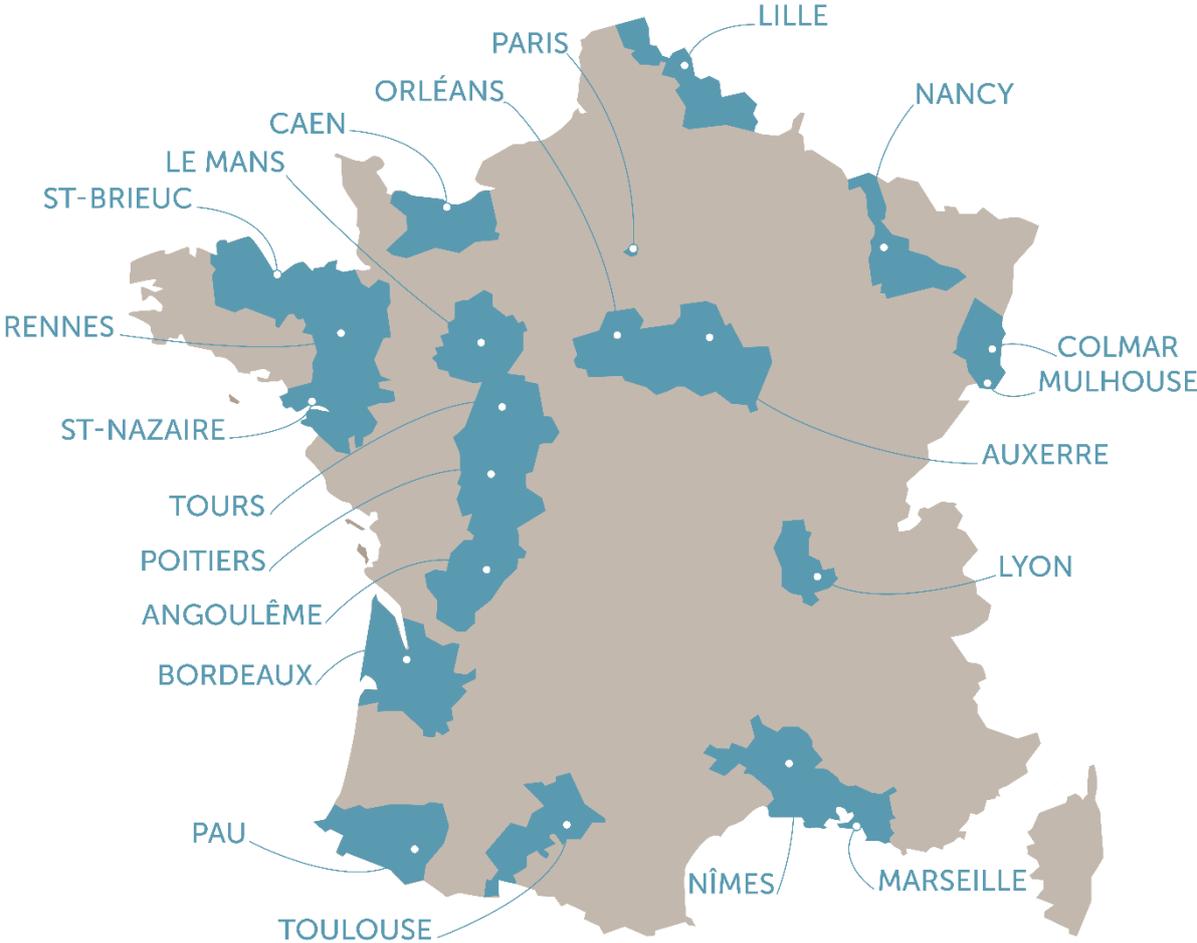
**Table S7: Characteristics of participants with current Allergic Rhinitis (AR) defined by SPTs including ever-asthma (A) and ever-conjunctivitis (C) status in EGEA**

	AR-SPT alone (n=76)	AR-SPT and C (n=62)	AR-SPT and A (n=143)	AR-SPT and C and A (n=173)	p-value
Sex					0.06
Men	35 (46.1%)	24 (38.7%)	83 (58.0%)	89 (51.5%)	
Women	41 (54.0%)	38 (61.3%)	60 (42.0%)	84 (48.6%)	
Age, years	38.6 (14.1)	42.8 (14.6)	33.9 (14.9)	37.8 (15.2)	0.001
Tobacco status					0.86
Never-smoker	36 (47.4%)	35 (56.5%)	77 (53.9%)	93 (53.8%)	
Ex-smoker	20 (26.3%)	12 (19.4%)	28 (19.6%)	32 (18.5%)	
Current smoker	20 (26.3%)	15 (24.2%)	38 (26.6%)	48 (27.8%)	
Educational level					0.15
Less than high school	14 (18.4%)	7 (11.3%)	26 (18.4%)	20 (11.6%)	
High school	18 (23.7%)	15 (24.2%)	48 (34.0%)	59 (34.3%)	
University	44 (57.9%)	40 (64.5%)	67 (47.5%)	93 (54.1%)	
Eczema					<.0001
Never eczema	53 (70.7%)	42 (67.7%)	71 (50.4%)	70 (40.5%)	
Ever eczema	22 (29.3%)	20 (32.3%)	70 (49.7%)	103 (59.5%)	
Indoor SPTs					0.001
No positive SPT	26 (34.2%)	18 (29.0%)	18 (12.6%)	40 (23.1%)	
At least one positive SPT	50 (65.8%)	44 (71.0%)	125 (87.4%)	133 (76.9%)	
Mould SPTs					0.89
No positive SPT	61 (80.3%)	48 (77.4%)	108 (75.5%)	133 (76.9%)	
At least one positive SPT	15 (19.7%)	14 (22.6%)	35 (24.5%)	40 (23.1%)	
Outdoor SPTs					0.11
No positive SPT	22 (29.0%)	15 (24.2%)	39 (27.3%)	30 (17.3%)	
At least one positive SPT	54 (71.1%)	47 (75.8%)	104 (72.7%)	143 (82.7%)	
Number of positive SPTs	2.2 (1.3)	2.8 (1.9)	2.9 (1.7)	3.1 (1.6)	0.0006
Immunoglobulin E, IU/ml	92.4 (46.4-197.0)	102.3 (48.0-209.0)	212.2 (90.0-495.0)	184.4 (84.1-385.0)	<.0001
Blood eosinophils count, cell/mm <sup>3</sup>	182.3 (136.6)	219.3 (121.5)	271.3 (198.4)	249.4 (187.5)	0.004
Age of onset of rhinitis, year	20.7 (12.9)	23.0 (13.3)	14.3 (13.1)	12.5 (10.9)	<.0001
Reported triggers of rhinitis symptoms†					
Dust mites or house dust	26 (34.2%)	25 (40.3%)	83 (58.0%)	99 (57.2%)	0.0007
Animals	13 (17.1%)	13 (21.0%)	44 (30.8%)	79 (45.7%)	<.0001
Pollens	50 (65.8%)	45 (72.6%)	77 (53.9%)	130 (75.1%)	0.001
Other	9 (11.8%)	3 (4.8%)	15 (10.5%)	9 (5.2%)	0.14
No trigger reported	4 (5.3%)	3 (4.8%)	11 (7.7%)	5 (2.9%)	0.29
Reported symptoms†					
Rhinorrhoea	52 (71.2%)	41 (69.5%)	102 (74.5%)	135 (81.8%)	0.14
Sneezing	66 (88.0%)	55 (90.2%)	116 (84.7%)	144 (85.7%)	0.73
Associated-eye symptoms	56 (77.8%)	53 (89.8%)	98 (72.1%)	146 (86.9%)	0.002
Impairment in daily activities					0.004
None	46 (60.5%)	28 (45.2%)	76 (53.2%)	64 (37.0%)	
A little	21 (27.6%)	25 (40.3%)	34 (23.8%)	62 (35.8%)	
Moderate	8 (10.5%)	8 (12.9%)	21 (14.7%)	30 (17.3%)	
A lot	1 (1.3%)	1 (1.6%)	12 (8.4%)	17 (9.8%)	
Duration					0.02
<1 month/year	38 (50.7%)	26 (41.9%)	57 (39.9%)	50 (28.9%)	
>1 month/year and <4 days/week	19 (25.3%)	11 (17.7%)	37 (25.9%)	53 (30.6%)	
>1 month/year and >4 days/week	18 (24.0%)	25 (40.3%)	49 (34.3%)	70 (40.5%)	

Data are mean (SD) or geometric mean (quartile 1 – quartile 3) or n (%), †: several possible answers, all SPTs: skin prick tests to 12 aeroallergens: indoor: cat, *Dermatophagoides pteronyssinus*, *Blattella germanica*; outdoor: olive, birch, *Parietaria judaica*, timothy grass, ragweed pollen and *Cupressus*; moulds: *Aspergillus*, *Cladosporium herbarum*, *Alternaria tenuis*

**Figure S1: Location of the participating Health Screening Centers in France**

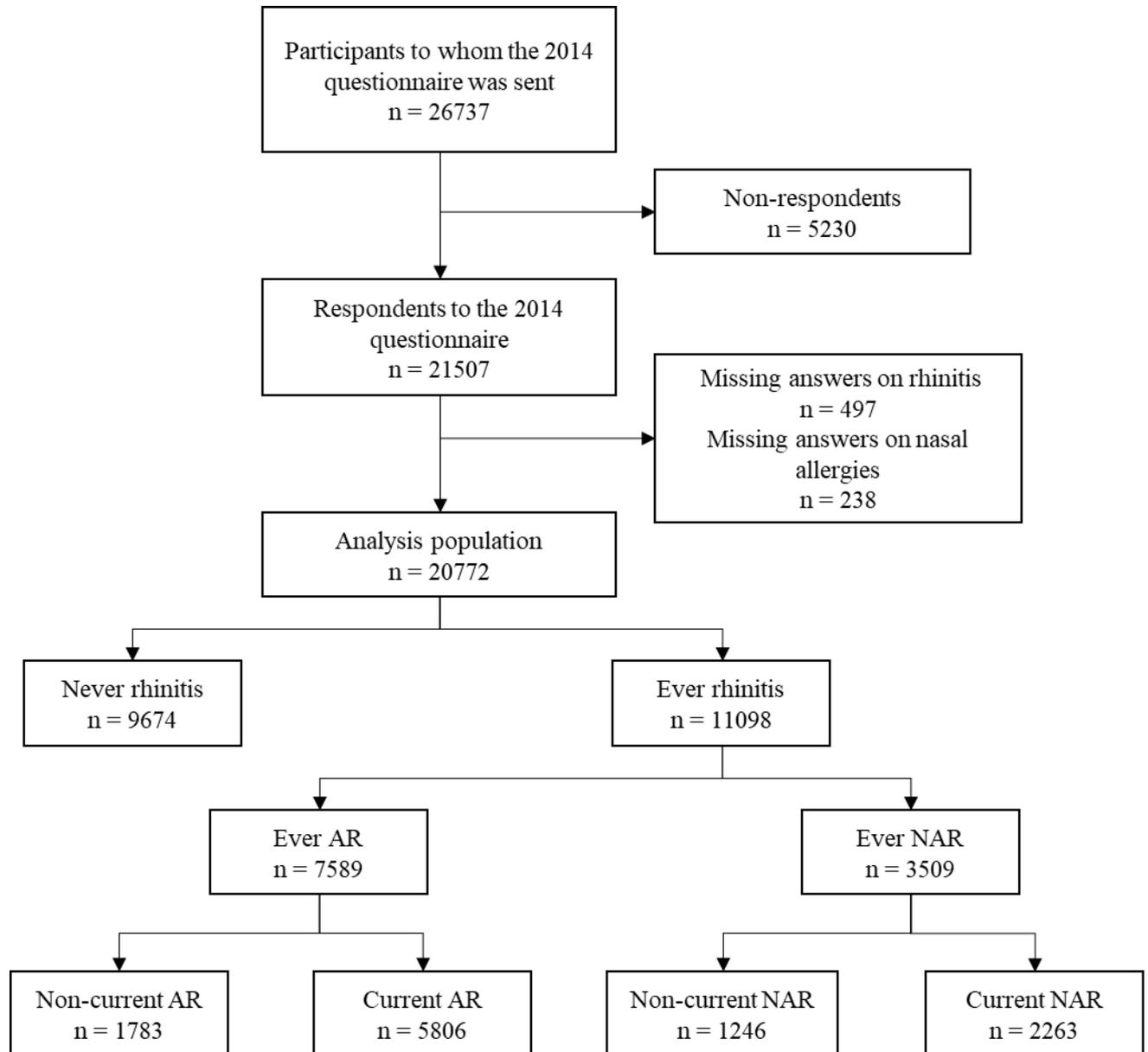
Three health screening centers were located in Paris.



**Figure S2: Flowchart**

AR: Allergic Rhinitis

NAR: Non-Allergic Rhinitis



### Figure S3: Percentage of participants reporting symptoms by months

#### A: Current Allergic Rhinitis

Current rhinitis: Yes to Q.23 *“During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?”*

.... AR Main definition: current rhinitis and Yes to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”*

- - AR Alternate Definition 1: current rhinitis and answer pollens or dust mites or house dust or animal to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”*

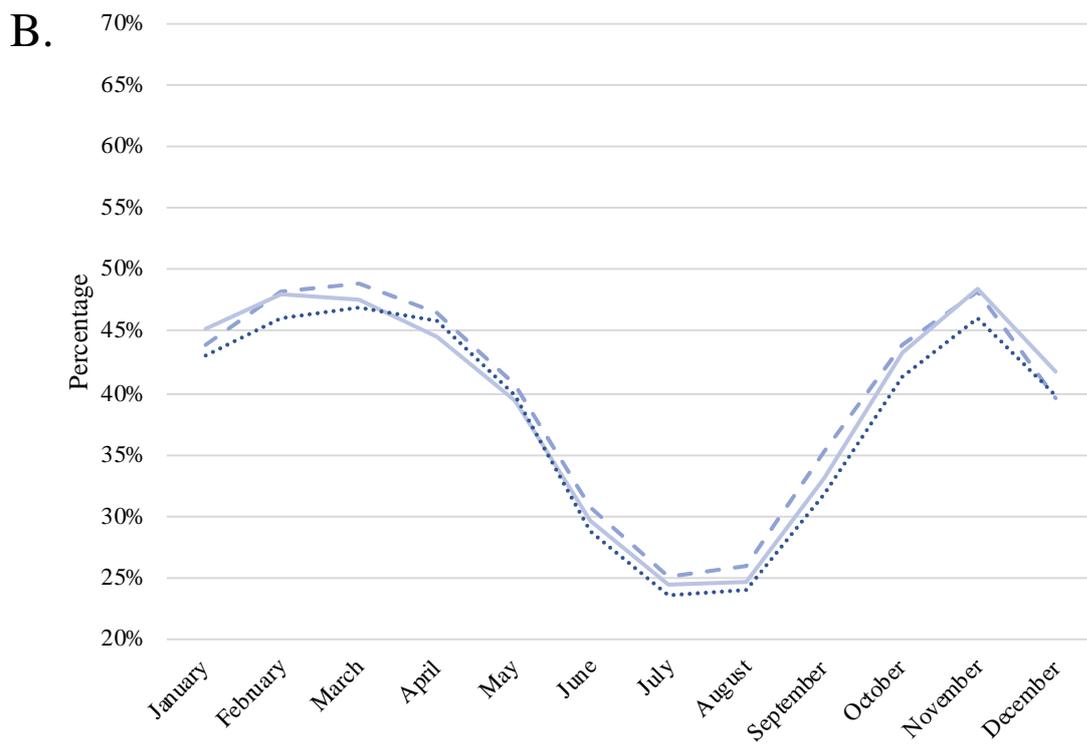
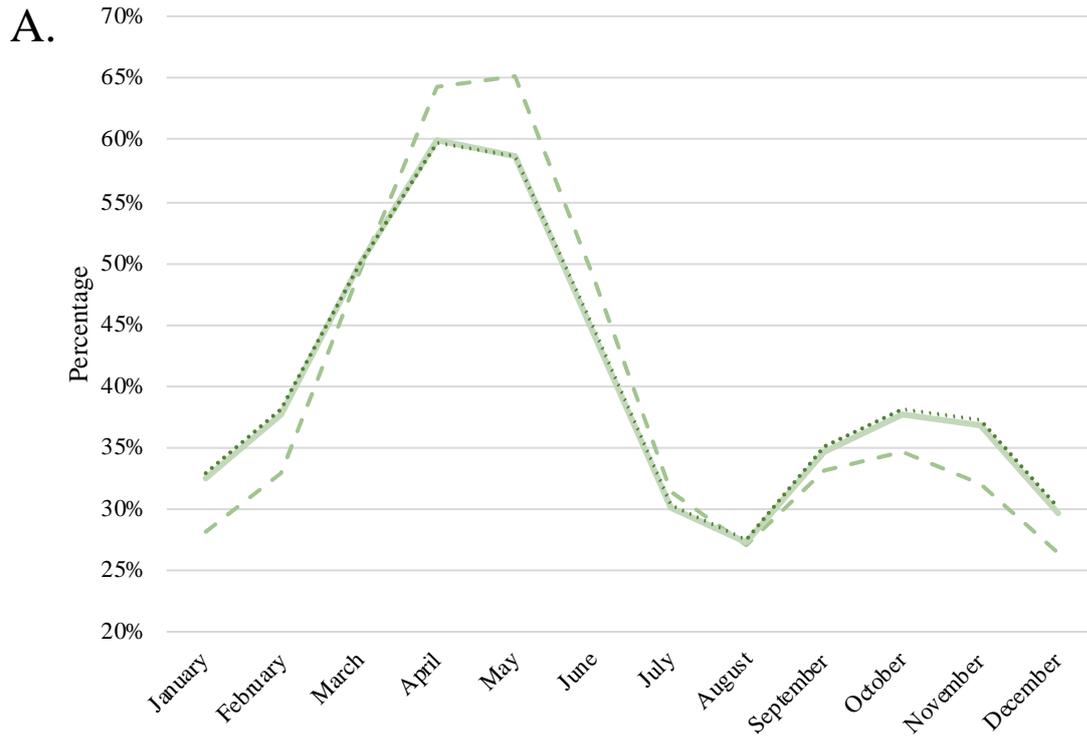
— AR Alternate Definition 2: current rhinitis and Yes to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”* or Answer pollens to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”* and Yes to Q.23.A *“Did your eyes itch or cry when you had these nose problems?”*

#### B: Current Non-Allergic Rhinitis

.... NAR Main definition: current rhinitis and No to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”*

- - NAR Alternate Definition 3: current rhinitis and no answer pollens and dust mites and house dust and animal to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”*

— NAR Alternate Definition 4: current rhinitis and No to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”* and no answer pollens to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”* or no to Q.23.A *“Did your eyes itch or cry when you had these nose problems?”*



#### **Figure S4: Triggers of rhinitis symptoms (several possible answers)**

##### **A: Current Allergic Rhinitis**

Current rhinitis: Yes to Q.23 *“During your lifetime, have you ever had a problem with sneezing, or a runny, or a blocked nose when you did not have a cold or the flu?”*

.... AR Main definition: current rhinitis and Yes to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”*

- - AR Alternate Definition 1: current rhinitis and answer pollens or dust mites or house dust or animal to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”*

— AR Alternate Definition 2: current rhinitis and Yes to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”* or Answer pollens to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”* and Yes to Q.23.A *“Did your eyes itch or cry when you had these nose problems?”*

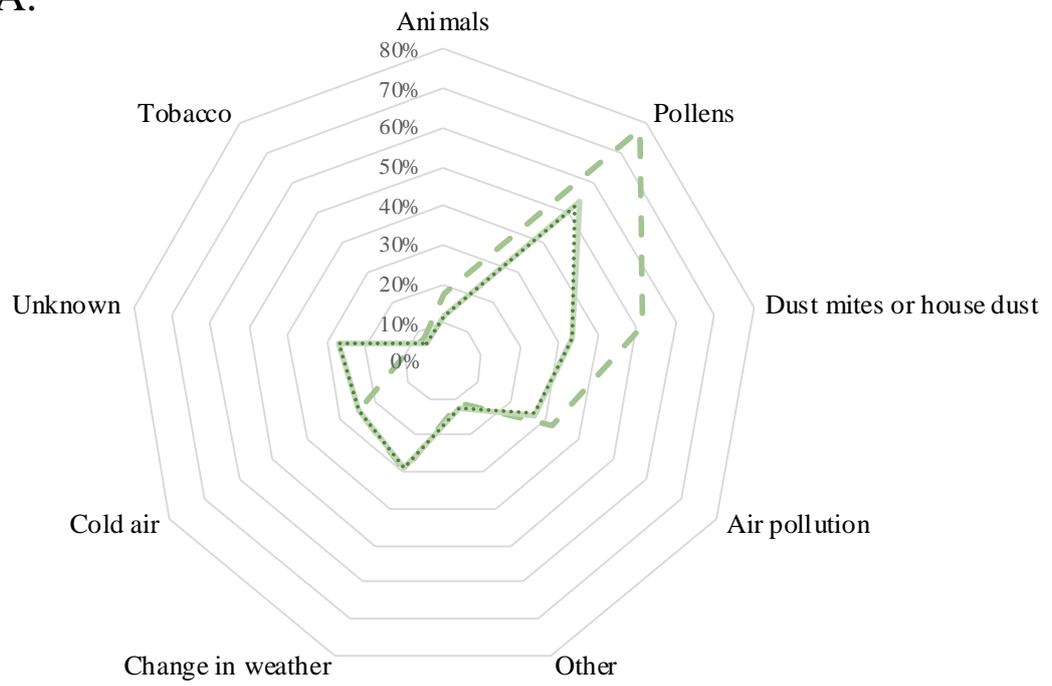
##### **B: Current Non-Allergic Rhinitis**

.... NAR Main definition: current rhinitis and No to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”*

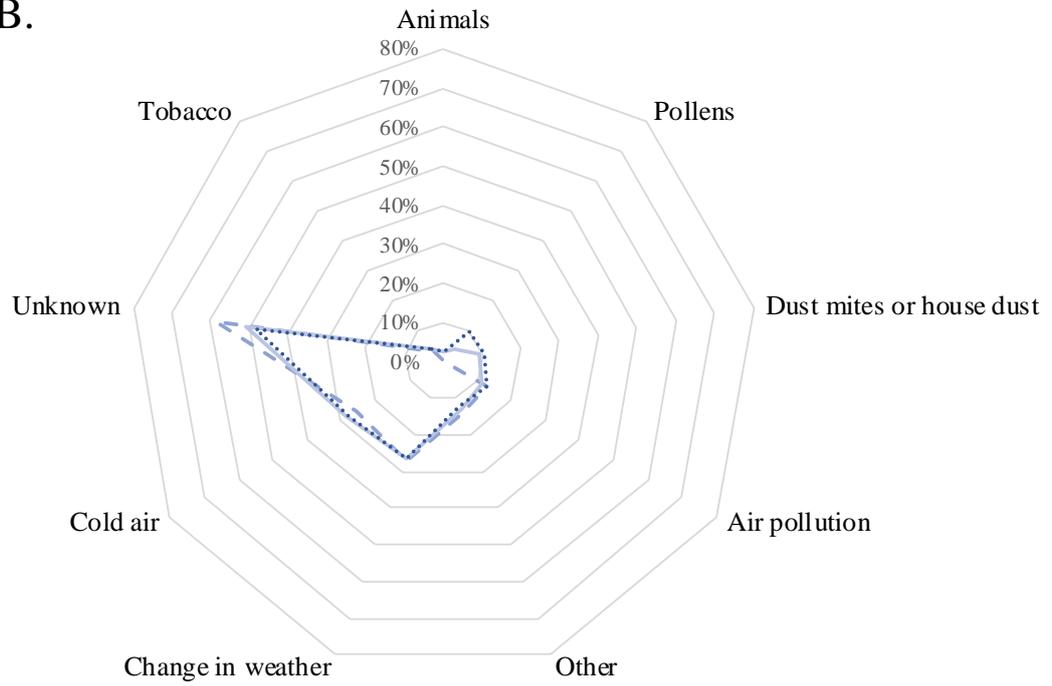
- - NAR Alternate Definition 3: current rhinitis and no answer pollens and dust mites and house dust and animal to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”*

— NAR Alternate Definition 4: current rhinitis and No to Q.22: *“During your lifetime, have you ever had any nasal allergies including hay fever?”* and no answer pollens to Q.25: *“What factor triggered or increased these nose problems? (several answers possible)”* or no to Q.23.A *“Did your eyes itch or cry when you had these nose problems?”*

A.



B.



**Figure S5: Comparison between Constances and EGEA for prevalence of ever-eczema, mean age of onset, and mean eosinophils count**

Blue filling: results from Constances

Hatched orange filling: results from EGEA

AR alone: current Allergic Rhinitis alone

AR + C: current Allergic Rhinitis and ever-conjunctivitis without ever-asthma

AR + A: current Allergic Rhinitis and ever-asthma without ever-conjunctivitis

AR + C + A: current Allergic Rhinitis and ever-conjunctivitis and ever-asthma

