

1 **Appendix A: supplementary data**

2

3 Table 1. Correspondence between allergenic risk categories defined by RNSA and daily
4 airborne pollen concentration (Thibaudon *et al.*, 2008). RAEP = risque allergique
5 d'exposition aux pollens.

6

7 Allergenic risk Pollen concentration

8 (grains/m³*day)

9 RAEP=0 0

10 RAEP=1 1-2

11 RAEP=2 3-5

12 RAEP=3 6-12

13 RAEP=4 13-30

14 RAEP=5 >30

15

16

17 Table 2. Health costs (in M€) from *Ambrosia* allergy in the Rhône-Alpes region (data from ORS Rhône-Alpes, 2011, 2012, 2013, 2015). Given
 18 are a low cost estimate which accounts for the population that is most likely affected by ragweed allergy (number before slash) as well as a high
 19 cost estimate accounting for the whole regional population (number after slash). Data are based on the consumption of medical care and medical
 20 goods by persons affiliated to the general health insurance scheme. The costs were calculated as follows: (A) Costs of anti-allergic medication
 21 reimbursed during the *Ambrosia* flowering period (data from pharmacies; including costs not reimbursed by the insurance); (B) Costs of anti-
 22 asthmatic medication (treatments of asthma crisis) reimbursed during the *Ambrosia* flowering period; (C) Consultations by generalist doctors or
 23 specialist doctors linked to either the prescription of anti-allergic medication during the *Ambrosia* flowering period, or to research on specific
 24 Immunoglobulin E (IgE) throughout the year; (D) Annual costs for biological IgE tests, research on specific IgE, and for skin prick tests; (E)
 25 Annual costs for injectable desensitisation actions and allergological tests; (F) Annual costs for oral or sublingual desensitisation products; and
 26 (G) Per diems for sick leave of less than 20 days when linked to the prescription of anti-allergic drugs.

27

	2008	2009	2010	2011	2012	2013	2014	2015
29 Anti-allergic medications	1,95/3,17	2,12/3,33	2,37/3,78	3,54/5,57/	2,44/3,56	2,34/3,52	2,01/3,13	1,84/3,01
30 Anti-asthma medication	-	-	0,15/0,28	0,24/0,44	0,21/0,34	0,20/0,33	0,19/0,32	0,20/0,34
31 Medical consultations	2,08/3,09	2,67/3,84	2,53/3,65	4,36/6,21	3,55/4,81	3,10/4,43	2,72/3,98	3,48/5,13

32	Biological IgE ¹ and	0,09/0,15	0,11/0,18	0,11/0,17	0,14/0,22	0,12/0,17	0,13/0,19	0,12/0,18	0,23/0,32	skin prick
33	skin prick tests									
34	Injectable desensitisation	0,25/0,40	0,22/0,32	0,20/0,31	0,29/0,43	0,25/0,34	0,25/0,36	0,22/0,32	0,13/0,19	
35	Oral or sublingual	-	1,88/1,90	2,16/3,53	3,28/3,97	2,99/4,21	3,16/4,63	2,05/3,12	1,57/2,41	
36	desensitisation									
37	Work absenteeism	1,26/1,74	1,64/2,25	1,56/2,16	2,36/3,20	1,76/2,29	1,67/2,25	1,61/2,15	1,51/2,01	
38	Total	5,63/8,56	8,63/11,82	9,07/13,88	14,21/20,03	11,33/15,73	10,85/15,70	8,92/13,19	8,95/13,41	

39

40 ¹ In vitro diagnostic to measure the level of specific IgE in the sera of the patient.

41

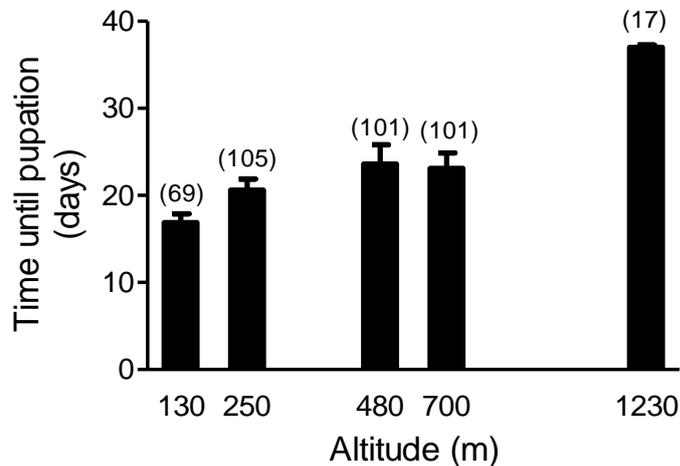
42 Table 3. Regression of the annual allergic risk (expressed as the cumulated number of days with RAEP ≥ 3 over the 13 stations) on estimated
43 annual health costs from *Ambrosia* allergy in the Rhône-Alpes region. Regressions were calculated with the log-transformed low and high
44 estimates of annual health costs (for further information see also Appendix A: Table 2).

45

46	Regression equation	Adjusted r-squared	p-value
47	$\log_{10}(\text{high_cost_estimate}) = 0.5883 + 0.0017 * (\text{number of days with RAEP} \geq 3)$	0.417	0.0498
48	$\log_{10}(\text{low_cost_estimate}) = 0.3348 + 0.0020 * (\text{number of days with RAEP} \geq 3)$	0.504	0.0292

49

50 Fig. 1. Developmental time of *Ophraella communa* (from egg stage to pupation) along an
51 altitudinal gradient in the Southern Alps. Numbers in brackets indicate the number of pupae
52 from which developmental time was recorded at each site.



53
54 The temperature-dependent developmental time of *Ophraella communa* was experimentally
55 assessed along an altitudinal gradient in the southern Alps, approximately 50 km North of the
56 Milan area. The five field sites were set up on sun-exposed grassland or in private gardens at
57 130 m (in the Po plain), 250 m, 480 m, 700 m and 1230 m. Greenhouse-reared, potted *A.*
58 *artemisiifolia* plants were exposed to female *O. communa* in a field cage set up at the lowest
59 elevation. Plants with freshly laid egg batches were individually covered with a gauze bag,
60 firmly attached to the pot with an elastic ribbon, and transferred within 48 hours after
61 oviposition to one of the five field sites in a randomized order. At the field site, plants were
62 placed within a 1 x 1 x 2 m gauze cage, dug together with the pots into the soil and regularly
63 watered. Two cohorts of 5-8 plants each were transferred to the five field sites, with the
64 exception of the highest site which only received plants from the second cohort. The first
65 cohort was set up between 29 June and 2 July and the second cohort between 8 and 10
66 August. Each field site was visited at least once a week to record the presence of life stages
67 on each *A. artemisiifolia* plant.

68