SUPPLEMENTARY MATERIAL

Table 1S. Sociodemographic and clinical characteristics

Characteristics	N (300)	
Age at reference date*		
Median (Q1, Q3)	50	39; 62
	N	**%**
Sex		
Male	83	27,7%
Female	217	72,3%
Working status		
Employed, full-time	151	50,3%
Employed, part-time	30	10,0%
Homemaker	29	9,7%
Student	13	4,3%
Unemployed	16	5,3%
Retired	45	15,0%
Disabled	7	2,3%
Other	9	3,0%
Comorbidities[1]		
Do not know/no comorbidities	25	8,3%
With comorbidities	275	91,7%
Presence of allergic sensitization (diagnosed by blood or skin testing)	150	50,0%
Allergic rhinitis	108	36,0%
Heart disease	17	5,7%
Anxiety	77	25,7%
Anaphylaxis	21	7,0%
Arthritis	28	9,3%
Aspirin sensitivity	25	8,3%
Atopic dermatitis/Eczema	46	15,3%
Chronic bronchitis	21	7,0%
Chronic Obstructive Pulmonary Disease (COPD)	9	3,0%
Chronic sinusitis	27	9,0%
Depression	51	17,0%
Diabetes	17	5,7%
Emphysema	5	1,7%
GERD (heartburn/reflux)	64	21,3%
Hypertension	52	17,3%
Chronic rhinosinusitis with Nasal Polyps	42	14,0%
Sleep Apnea	25	8,3%
Stroke	3	1,0%
Others	44	14,7%
Clinician-reported		

Age at initial diagnosis (years)		
Median (Q1, Q3)	30	14; 46
Years since initial diagnosis		
Median (Q1, Q3)	13	6; 29
Spirometry performed in the last year		
Yes	256	85,3%
No	44	14,7%
Asthma medications		
ICS (monotherapy)	12	4,0%
ICS + LABA	243	81,0%
LAMA	100	33,3%
LTRA	66	22,0%
SABA	10	3,3%
OCS	16	5%
Biologics	30	10%
Exacerbations experienced in the last year		
Number of patients with a severe exacerbation	116	38,7%
Number of patients with an exacerbation that resulted in hospitalization for asthma for ≥ 24 hours	21	7,0%
Number of severe exacerbations	**N**	**%**
Mean (SD)	0,8	1,31
Median (Q1, Q3)	0	0; 1
Min, max	0	6
Number of exacerbations requiring short term OCS treatment for at least three days AND/OR increase of OCS dosis[1]		
Mean (SD)	1,1	1,14
Median (Q1, Q3)	1	0; 1
Min, max	0	5
Number of exacerbations requiring visit to an emergency room (stay ≥ 24 hours), unplanned office visit or treatment with systemic corticosteroid[1]		
Mean (SD)	0,8	0,8
Median (Q1, Q3)	1	0; 1
Min, max	0	4
Number of exacerbations that resulted in hospitalization for asthma for ≥ 24 hours		
Mean (SD)	0,2	0,58
Median (Q1, Q3)	0	0; 0
Min, max	0	4

*Out of 300 patients, 2 (0.7%) were adolescents (<18 years old)

Abbreviations: GERD, gastroesophageal reflux disease; ICS, inhaled corticosteroid; LABA, long-acting beta-agonist; LAMA, long-acting muscarinic antagonist; LTRA, leukotriene receptor antagonist; OCS, oral corticosteroid; SABA, short-acting beta-agonist.

Table 2S. Asthma control definition

Asthma control levels	ACT	Exacerbations		ACQ-6	AIRQ
		Use of OCS or emergency visits /no planned in the last 12 months	Hospitalisations in the last 12 months		
Well controlled	≥20	0	0	≤0,7	≤1
Not well controlled	16-19	1	0	0,8-1,5	2-4
Very poorly controlled	≤15	≥2	≥1	>1,5	≥5

[1]Among patients suffering any severe exacerbations

Table 3S. Performance characteristics of the AIRQ questionnaire for the Spanish cohort based on the participant's ACT score plus exacerbation history

AIRQ Models	LR+	LR-	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	AIC	AUC	Model Fit
					Full Anallysis Set (FAS)				
Univariate Model 1[1]									
AIRQ score cut-off									
≥ 1	2,37	0,04	97.7%	58.8%	85.7%	90.9%	238,467	78.2%	
≥ 2	6,33	0,12	89.3%	85.9%	94.1%	76.0%	200,992	87.6%	
≥ 3	16,01	0,26	75.3%	95.3%	97.6%	60.4%	221,578	85.3%	
≥ 4	53,37	0,38	62.8%	98.8%	99.3%	51.2%	243,073	80.8%	
≥ 5	0	0,51	48.8%	100%	100%	43.6%	271,113	74.4%	*
≥ 6	0	0,62	38.1%	100%	100%	39.0%	295,556	69.1%	*
≥ 7	0	0,74	25.6%	100%	100%	34.7%	320,31	62.8%	*
≥ 8	0	0,81	19.1%	100%	100%	32.8%	331,835	59.5%	*
≥ 9	0	0,92	8.4%	100%	100%	30.1%	349,203	54.2%	*
= 10	0	0,98	1.9%	100%	100%	28.7%	358,958	50.9%	*
Univariate Model 2[2]									
AIRQ score cut-off									
≥ 1	1.44	0	100%	30.4%	48.6%	100%	343,442	65.2%	*
≥ 2	2,05	0,03	98.3%	51.9%	57.4%	97.9%	301,819	75.1%	
≥ 3	2,99	0,11	92.4%	69.1%	66.3%	93.3%	282,227	80.7%	
≥ 4	4,56	0,18	85.7%	81.2%	75.0%	89.6%	266,195	83.5%	
≥ 5	8,46	0,28	74.8%	91.2%	84.8%	84.6%	261,068	83.0%	
≥ 6	16,30	0,38	63.0%	96.1%	91.5%	79.8%	271,116	79.6%	
≥ 7	40,31	0,56	44.5%	98.9%	96.4%	73.1%	306,681	71.7%	
≥ 8	60,84	0,67	33.6%	99.4%	97.6%	69.5%	332,002	66.5%	
≥ 9	0	0,85	15.1%	100%	100%	64.2%	371,925	57.6%	*
= 10	0	0,97	3.4%	100%	100%	61.1%	399,502	51.7%	*

*Quasi-complete separation of data points. The maximum likelihood estimate does not exist at this point. The validity of the model fit is questionable for this cut-off point
[1]Model 1 compared well-controlled vs. not well-controlled/very poorly controlled asthma
[2]Model 2 compared well-controlled/not well-controlled vs. very poorly controlled asthma
[3]Multivariate-adjusted model for age, sex, and asthma medication

Table 4S. Performance characteristics of the AIRQ questionnaire for the Spanish cohort based on the participant's ACQ-6 score plus exacerbation history

AIRQ Models	LR+	LR-	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	AIC	AUC	Model Fit
					Full Anallysis Set (FAS)				
Univariate Model 1[1]									
AIRQ score cut-off									
≥ 1	2,17	0,04	97.6%	54.9%	83.3%	90.9%	258,821	76.3%	
≥ 2	4,50	0,14	89.0%	80.2%	91.2%	76.0%	231,477	84.6%	
≥ 3	8,60	0,27	75.6%	91.2%	95.2%	61.9%	246,176	83.4%	
≥ 4	14,37	0,39	63.2%	95.6%	97.1%	53.0%	266,834	79.4%	
≥ 5	22,42	0,52	49.3%	97.8%	98.1%	45.6%	292,648	73.5%	
≥ 6	35,27	0,62	38.8%	98.9%	98.8%	41.3%	310,356	68.8%	
≥ 7	23,51	0,75	25.8%	98.9%	98.2%	36.7%	336,185	62.4%	
≥ 8	17,42	0,82	19.1%	98.9%	97.6%	34.7%	347,968	59.0%	
≥ 9	0	0,91	8.6%	100%	100%	32.3%	358,691	54.3%	*
= 10	0	0,98	1.9%	100%	100%	30.7%	369,282	51.0%	*
Univariate Model 2[2]									
AIRQ score cut-off									
≥ 1	1,49	0,02	99.3%	33.3%	55.9%	98.2%	350,198	66.3%	
≥ 2	2,30	0,04	97.8%	57.4%	66.2%	96.9%	291,762	77.6%	
≥ 3	3,70	0,12	91.3%	75.3%	75.9%	91.0%	268,129	83.3%	
≥ 4	5,77	0,21	81.9%	85.8%	83.1%	84.8%	267,648	83.8%	
≥ 5	12,52	0,32	69.6%	94.4%	91.4%	78.5%	268,618	82.0%	
≥ 6	22,89	0,45	56.5%	97.5%	95.1%	72.5%	292,503	77.0%	
≥ 7	63,39	0,61	39.1%	99.4%	98.2%	65.7%	329,023	69.3%	
≥ 8	46,96	0,71	29.0%	99.4%	97.6%	62.2%	356,974	64.2%	
≥ 9	0	0,87	13.0%	100%	100%	57.4%	388,656	56.5%	*
= 10	0	0,97	2.9%	100%	100%	54.7%	411,691	51.4%	*

*Quasi-complete separation of data points. The maximum likelihood estimate does not exist at this point. The validity of the model fit is questionable for this cut-off point
[1]Model 1 compared well-controlled vs. not well-controlled/very poorly controlled asthma
[2]Model 2 compared well-controlled/not well-controlled vs. very poorly controlled asthma
[3]Multivariate-adjusted model for age, sex, and asthma medication

Table 5S. Agreement between AIRQ, ACT, and ACQ-6 score and physician assessment of asthma control

	Full Anallysis Set (FAS)										
	Physician global assessment of patient asthma control									Weighted Kappa[1]	95% CI[2]
	Well controlled			Not well controlled			Poorly controlled				
	N	%	95% CI	N	%	95% CI	N	%	95% CI		
AIRQ score assessment	102			124			74				
Missing	0	0%	0%; 3.6%	0	0%	0%; 2.9%	0	0%	0%; 4.9%	0,62	0.55; 0.68
Well controlled	77	75.5%	66.0%; 83.5%	18	14.5%	8.8%; 22.0%	1	1.4%	0.0%; 7.3%		
Not well controlled	25	24.5%	16.5%; 34.0%	63	50.8%	41.7%; 59.9%	11	14.9%	7.7%; 25.0%		
Very poorly controlled	0	0%	0%; 3.6%	43	34.7%	26.4%; 43.7%	62	83.8%	73.4%; 91.3%		
ACT assessment	102			124			74				
Missing	0	0%	0%; 3.6%	0	0%	0%; 2.9%	0	0%	0%; 4.9%	0,71	0.64; 0.77
Well controlled	87	85.3%	76.9%; 91.5%	13	10.5%	5.7%; 17.3%	2	2.7%	0.3%; 9.4%		
Not well controlled	15	14.7%	8.5%; 23.1%	76	61.3%	52.1%; 69.9%	8	10.8%	4.8%; 20.2%		
Very poorly controlled	0	0%	0%; 3.6%	35	28.2%	20.5%; 37.0%	64	86.5%	76.5%; 93.3%		
ACQ-6 assessment	102			124			74				
Missing	0	0%	0%; 3.6%	0	0%	0%; 2.9%	0	0%	0%; 4.9%	0,59	0.51; 0.65
Well controlled	87	85.3%	76.9%; 91.5%	24	19.4%	12.8%; 27.4%	5	6.8%	2.2%; 15.1%		
Not well controlled	12	11.8%	6.2%; 19.6%	45	36.3%	27.8%; 45.4%	6	8.1%	3.0%; 16.8%		
Very poorly controlled	3	2.9%	0.6%; 8.4%	55	44.4%	35.4%; 53.5%	63	85.1%	75.0%; 92.3%		

[1]Weighted Kappa was calculated using Cicchetti-Allison weights (linear weights)
[2] Kappa 1,000 bootstrap sample was used to calculate 95%CI