Table S1. Characteristics of the included studies assessing prevalence of rhinitis before puberty (<11y)

Study Ref (N=46)	Country	Sampling method	Residency	Method for assessing PR	Sample analysed	Study period	Rhinitis	
							M (%)	F (%)
Ahn et al [S1]	Korea	Children from 1st year of elementary (6292 schools) and middle school (3137 schools) were chosen from a random sample of 45 primary and 40 middle schools across the nation (7 metropolitan regions and 9 provinces).	Rural/Urban	ISAAC Q	8115	2010	6-7y 429/1958 (21.9)	6-7y 305/1931 (15.8)
Al-Riyami et al [S2]	Oman	A nationwide sample of public schools were chosen for conducting the stratified multistage sampling method, using the 10 health regions of Oman as a strata. The first stage of sampling consisted of randomly selecting schools as primary sample units from each health region. In the second stage, one class was chosen randomly from each school as the secondary sample unit with participation of all children in the selected class. The total national target sample was distributed among the 10 regions of the country using the proportion allocation method.	U/NR	ISAAC Q	3893	-	6-7y 263/1624 (16.2)	6-7y 209/1550 (13.5)
Amarasekera et al [S3]	Sri Lanka	Children in the fifth grade of school, attending 17 state schools in the 3 districts of the Western Province of Sri Lanka. Participating schools were selected by multi-stage stratified randomisation. In the first stage, stratification was done by type of schools recognised by the Ministry of Education. In the second stage, schools of each type were randomly selected from rural and urban areas, in proportion to the size of the urban and rural populations of the province. In the third stage, in each selected school, one class in Grade 5 was randomly selected as the study population.	Rural/Urban	ISAAC Q	511	2006	10y 67/277 (24.2)	10y 37/234 (15.8)
Annesi-Maesano et al [S4]	France	Recruited schoolchildren (9-10 years) from unclear sample "including 6 cities", "401 randomly chosen classrooms in 108 primary schools attended by 6590 children"	Urban	ISAAC Q	6590	-	9-10y (13.1)	9-10y (10.7)

Anthracopoulos et al [S5]	Greece	3 separate cross-sectional surveys of 8-10 year old children. Identical methodology in the targeting, distribution and collection of the parental questionnaire.	Urban	Other Q "Current" refers to "in the last 2 years".	2417	1991	8-10y 64/1181 (5.4)	8-10y 59/1236 (4.8)
					3076	1998	8-10y 97/1507 (6.4)	8-10y 104/1569 (6.6)
					2725	2003	8-10y 113/1337 (8.5)	8-10y 104/1388 (7.5)
Arnedo-Pena et al [S6]	Spain	Phase III (2001-2002) included schoolchildren from 8 centres (Asturias, Barcelona, Bilbao, Pamplona, Madrid, Castellon, Valencia, Cartagena) and results were compared with phase I (1993-1994). In 3 centres schools were selected by simple randomisation, and the rest of the centres included all the schools in the area.	Rural/Urban	ISAAC Q	24862	2002	6-7 y 2297/12418 (18.5)	6-7 y 1991/12444 (16.1)
Backer et al [S7]	Mexico	A population-based cross-sectional study was performed by applying a standardized questionnaire to a random sample of 2087 school children 6-7 years old living in the city of Mexicali, capital of Baja California, north of Mexico. 55 schools were randomly selected among all elementary schools of Mexicali.	Rural/Urban	ISAAC Q	2087	2004	6-7 y 294/1009 (29.1)	6-7 y 227/1078 (21.1)
Castro et al [S8]	Brazil	The study target population consisted of public school students aged from 6 to 7 years living in the city of Londrina, Brazil. They selected 38 schools, distributed proportionally among the five regions of the city: northern; southern; eastern; western; and downtown. All children in the established age range enrolled in these schools were invited to participate in the study.	Urban	ISAAC Q	3600	2008	6-7y 547/1837 (29.8)	6-7y 437/1763 (24.8)
Dell et al [S9]	Canada	Schools were selected by use of a random number generator from a pool of 556 eligible schools within the two publicly funded school boards in Toronto (Toronto District School Board and the Toronto Catholic District School Board).	Urban	ISAAC Q	5619	2006	Mean 6.7y 679/2772 (24.5)	Mean 6.7y 613/3347 (18.3)

Del-Rio-Navarro et al [S10]	Mexico	A total of 50 elementary and 27 high schools were sampled which were randomly selected in the four participating city precincts (Miguel Hidalgo, Azcapotzalco, Gustavo A Madero, and Venustiano Carranza).	Urban	ISAAC Q	4016	2005	6-7y 1001/2098 (47.7)	6-7y 873/2008 (43.5)
Duggan et al [S11]	Ireland	Two cross-sectional studies were performed 5 yr apart (2002 and 2007), in the same 24 randomly selected state primary schools in Cork (city and suburbs). Both cross-sectional studies were carried out in the same season and used identical methodology.	Urban	ISAAC Q	1474	2002	6-9y 197/699 (28.2)	6-9y 189/775 (24.4)
					1535	2007	6-9y 237/795 (29.8)	6-9y 176/740 (23.8)
Falade et al [S12]	Nigeria	31 primary schools were randomly selected from a total of 272 primary schools in Ibadan (one of the most densely populated cities in Africa), and 2,325 children aged 6–7 years were selected from grades 1 and 2.	Urban		1648	1995	6-7y 85/844 (10.1)	6-7y 86/804 (10.7)
Futamura et al [S13]	Japan	Setagaya is located in the center of Tokyo. The study covered all 9 grades from 64 public elementary schools and 31 public junior high schools, with approximately 80% of the children attending these public schools.	Urban	ISAAC Q	27 917	2005	6y: 21.2 7y: 23.1 8y: 26.3 9y: 27.1 10y: 35.6	6y: 17.7 7y: 22.3 8y: 23.9 9y: 25.4 10y: 34.5
Garcia-Marcos et al [S14]	Spain	The cities of Bilbao, San Sebastian and La Coruña included all schools within the city district. Asturias (a province) included a random sample of schools.	Rural/Urban	ISAAC Q	9590	2002	6-7y 540/4733 (11.4)	6-7y 393/4847 (8.1)
Hahm et al [S15]	Korea	The sampling method was a stratified two-stage cluster sampling design, based on a comprehensive national list of schools at the time. First, schools were stratified by geographical region and school location (metropolitan, urban, rural). For each stratum, sample schools were selected using a systematic 'probability proportional to size' (PPS) sampling procedure. In the second stage, three classes were selected randomly from the first grade of each sample school, and all students were asked to participate.	Rural/Urban	ISAAC Q and SPT	3804	2010	6-7y AR: 523/1923 (27.2) NAR: 927/1923 (48.2)	6-7y AR: 319/1881 (17.0) NAR: 723/1881 (38.5)

Higuchi et al [S16]	Japan	To ensure nationwide representation, schools were randomly selected from all prefectures. The total number of children recruited was 179,218, approximately 2% of the pediatric population, according to data from the National Institute of Population and Social Security Research.	Rural/Urban	ISAAC Q	139 506	2008	6-7y 10592/21861 (48.5)	6-7y 8338/21013 (39.7)
Hong et al [S17]	Korea	This study enrolled 38,201 children between 0 and 13 years of age from 34 elementary schools and 136 children's daycare centers to participate in the 'Seoul Atopy Friendly School'.	Urban	ISAAC Q	31 201	2010	0-9y 4016/9825 (40.9)	0-9y 3083/9410 (32.8)
Kahwa et al [S18]	Jamaica	Stratified, multistage cluster sampling design using enumeration districts (EDs) as primary sampling units. Briefly, in stage 1, a random sample of EDs was selected proportional to parish size and independently from both urban and rural EDs. Stage 2 involved the selection of households using systematic probability sampling. The Kish selection table7 was used to select one eligible child per household in stage 3 yielding a sample size of 2017.	Rural/Urban	ISAAC Q	2017	2007	6-7y 25/138 (18.1)	6-7y 10/130 (7.7)
Kao et al [S19]	Taiwan	The area studied was Taoyuan County, northern Taiwan. First-grade children (aged 6–8) or eighth-grade (aged 13–15) children were recruited. One-stage stratified cluster random sampling was used in this study.	U/NR	ISAAC Q	6190	2002	6-8y 626/1546 (40.5)	6-8y 491/1533 (32.0)
Kong et al [S20]	China	Sixteen kindergartens located in the urban area of Wuhan were randomly selected from the complete sampling frame of all kindergartens in the area. In each kindergarten, three classes were randomly selected from the three grades (top, middle and bottom grade).	Urban	Authors designed a Q that was checked by experts of rhinology and epidemiology.	1211	2005	3-6y Rhinitis 28.4 (24.9-31.8) Rhinitis + SPT 13.0 (10.4-15.6)	3-6y Rhinitis 25.6 (22.0-29.2) Rhinitis + SPT 7.7 (5.5-9.9)

				Based on ISAAC Q and SPT.				
Kudzyte et al [S21]	Lithuania	Repeated cross-sectional epidemiological study was performed in 1994–1995 and 2001–2002 following the ISAAC protocol. Both surveys were conducted in the same population of children, randomly selected from the same primary schools in Kaunas.	Urban	ISAAC Q	1879	1994-1995	6-7y 182/914 (19.9)	6-7y 196/965 (20.3)
					2772	2001-2002	6-7y 320/1396 (22.9)	6-7y 288/1376 (20.9)
Kurosaka et al [S22]	Japan	We studied the epidemiology of allergic symptoms in six-year-old children attending primary schools throughout Himeji City, Japan, during a two-year period from 2005 to 2006. Himeji City, situated close to the Seto Inland Sea, has a population of about 530,000. The southern area of the city is industrial, with steel manufacture predominating, the central area is urban with a large population, and the northern area is rural with farmlands.	Rural/Urban	ISAAC Q	11 013	2006	6y 645/5666 (11.4)	6y 532/5347 (10.0)
Levesque et al [S23]	Canada	The Health and Social Survey of Quebec Children and Youth (HSSCY) recruited 189 schools to make up 3 separate samples of approx 1500 children aged 9, 13 and 16 years. The 3 samples were weighted to make them representative of all Quebec children of the same age.	Rural/Urban	ISAAC Q	3613	1999	9y (19.2)	9y (14.4)
Liao et al [S24]	Taiwan	A stratified random sampling method was used (47 schools were sampled randomly from the list of all elementary schools in Changhwa County by 16 districts, areas, and school size). In addition 4 areas in Changhwa county were classified for the comparison of the prevalence, including (1) the “TaiHao Petroleum Company area” with a lot of air-pollution due to a petrochemical company located in the northern part of the county; (2) the “XiZhou area” nearby a huge incinerator located in the southern part of the county; (3) the area of the coastal region; and	U/NR	ISAAC Q	7040	2002	6-8y 1121/3627 (30.9)	6-8y 771/3413 (22.6)

		(4) the rest of Changhwa County.						
Lima et al [S25]	Brazil	The districts included in this study correspond to 5.4% of the total population of São Paulo and present high demographic densities, including favelas, with predominantly low incomes15-17. Thirty-five exclusively municipal public schools distributed throughout this district whose population presents precarious living conditions were chosen.	Urban	ISAAC Q	3312	2002	6-7y 503/1510 (33.3)	6-7y 455/1671 (27.2)
Mavale-Manuel et al [S26]	Mozambique	From a total of 126 schools registered in Maputo, 21 primary schools and six secondary schools were randomly selected by stratifying for geographic (urban, suburban and semi-rural) location and inhabitant's density so as to be representative of the distribution of the population in Maputo.	Rural/Urban	ISAAC Q	5013	2004	6-7y 244/1207 (20.2)	6-7y 251/1176 (21.3)
Maziak et al [S27]	Germany	This study uses the information collected on two occasions 5 years apart (Phase I 1994/1995, Phase III 1999/2000). A random sample of all schools in the city of Münster was selected, and all pupils in the two grades with the highest proportion of 6–7 and 13–14 year olds were approached.	Urban	ISAAC Q	14 569	1994-1995	6-7y 272/1754 (15.5)	6-7y 165/1713 (9.6)
						1999-2000	6-7y 337/1863 (18.1)	6-7y 241/1666 (14.5)
Mohammadzadeh et al [S28]	Iran	Our sample study had 2 groups: the first group consisted of children aged 6-7 years and in the second group were 12-14 year-old children. The exclusion criteria in this study were mentally retarded children and those visiting rural schools. Each school was a cluster.59 elementary schools and 62 guidance schools were randomly selected.	Urban	ISAAC Q	5933	2003	6-7y 148/1412 (10.5)	6-7y 164/1632 (10.1)
Montefort et al [S29]	The Maltese Islands	Twenty-four state primary schools from Malta and Gozo were randomly chosen. The schools were scattered all over the two islands, and the total number of children within the two school was 4,465. This constituted 59.1% of children within this age group attending state schools in the Maltese Islands.	Rural/Urban	ISAAC Q	3506	-	5-8y (21.4)	5-8y (19.9)
Morais-Almeida et al [S30]	Portugal	A multistep selection strategy was used to obtain a representative sample of the target population.	Rural/Urban	ISAAC Q and ARIA	5018	2007	3-5y	3-5y

		First, the number of participants needed from each Portuguese region was defined based on the data from the 2001 Census on 3- to 5-year-old children. Second, Portuguese municipalities were randomly selected until reaching a prespecified number of children, considering that each municipality would provide between 50 and 70 individuals. Finally, kindergartens and parish centers within the selected municipalities were chosen for data collection based on children's distribution, comfort, privacy, and low interference with the usual activities of the participants.					1131/2561 (44.2)	1048/2457 (42.7)
Moyes et al [S31]	New Zealand	In each participating centre, schools were selected by sequential random sampling or by using all schools in the sampling frame so that 3000 6- to 7-year-olds and 3000 13- to14-year-olds were surveyed.	Rural/Urban	ISAAC Q	24 185	1993	6-7y 564/5639 (10.0)	6-7y 524/5754 (9.1)
Nahhas et al [S32]	Saudi Arabia	A list of all government and private primary schools (aged 6-12y) in Madinah was obtained from the General Directorate of Education in the Madinah region. Schools were then stratified (according to the geographical area and sex) and a random sample of 38 schools (9 schools for girls and 29 for boys) was approached.	Urban	ISAAC Q	5188	2008	6-8y 716/3585 (20.0)	6-8y 229/1603 (14.3)
Okuda [S33]	Japan	Two-step stratified random samplings were performed in individual zones. First, 390 of 3,370 places from cities, towns, and villages in Japan were randomly selected by the probability proportional sampling method in proportion to the overall population with respect to age (3 to 79 years) and sex on the basis of the National Census Report in 1995. As the second step, 2 subjects in each of the 7 age and sex groups (14 subjects in total for each factor) were sampled randomly from the resident registration lists of the aforementioned 390 places.	Rural/Urban	Other Q	10 866 (in total)	2001	3-9y 12.8% (9.3-16.2)	3-9y 9.7% (6.6-12.7)

Penaranda et al [S34]	Colombia	Among the 4535 registered educational institutions in Bogota schools were selected within neighbourhoods SES 3 and 4 (42% of the overall) for local security reasons. They randomly selected 74 of these schools for the 6–7 year age-group, and 48 for the 13–14 year age-group.	Urban	ISAAC Q	7085	2002	6-7y 229/1386 (16.5)	6-7y 319/1794 (17.8)
Peroni et al [S35]	Italy	Eighteen nursery schools located in the urban area of Verona (North-East part of Italy) were randomly selected from the complete sampling frame of all schools of the area.	Urban	ISAAC Q and SPT	1402	2001	3-5y 142/734 (19.4)	3-5y 94/668 (14.1)
Rad et al [S36]	Iran	They divided Urmia city into 11 homogenous clusters and selected 4 clusters by random sampling. A total of 25 schools were selected by systematic random sampling in each selected cluster.	Urban	ISAAC Q	2999	2003	6-7y 174/1450 (12.0)	6-7y 106/1549 (6.9)
Sanchez-Lerma et al [S37]	Spain	Research team sent a letter to all school principals explaining the objectives of the study and inviting them to participate. Personal interviews with interested principals were held.	Urban	ISAAC Q	1871	-	6-7y 42.9 (39.8-46.1)	6-7y 37.4 (34.2-40.5)
Selnes et al [S38]	Norway	1985: The schools were randomly selected within the three northernmost counties of Norway, Nordland, Troms and Finnmark. The 1995 study was designed as a 10-year follow-up to the study conducted in 1985. The 2000 study was part of an ISAAC-II Europe study. All 9–11 years old children in the counties of Troms and Finnmark were invited to participate.	U/NR	Other Q	1794	1985	9-11y (18.5)	9-11y (14.5)
					1432	1995	9-11y (27.2)	9-11y (22.1)
				ISAAC Q	3853	2000	9-11y (32.2)	9-11y (27.0)
Simoni et al [S39]	Italy; France; Norway; Sweden; Denmark	The cross-sectional HESE study involved six operational units in five European countries (Siena and Udine, Italy; Reims, France; Oslo, Norway; Uppsala, Sweden; and Arhus, Denmark). 21 schools (46 classrooms) with heterogeneous characteristics were selected, including a broad age range of buildings and a variety of location characteristics (about half in environmentally more advantaged areas and half	U/NR	ISAAC Q, Acoustic rhinometry, nasal secretions	654	2004-2005	Mean 10y (33)	Mean 10y (31)

		in less advantaged areas).						
Soto-Quiros et al [S40]	Costa Rica	From a total of 5000 educational centers registered in Costa Rica in 1995, 75 centers representative of the country were selected by random stratification on the basis of geographical location, rural and urban regions, and size.	Rural/Urban	ISAAC Q	6144	1995	6-7y 435/1478 (29.4)	6-7y 350/1466 (23.9)
Suh et al [S41]	Korea	The clustered random sampling method was used to obtain a representative population of elementary school students in each type of residential area. Residential areas were divided into four groups: metropolitan, provincial, rural, and industrial areas. An industrial area was defined as an industrial complex harboring an elementary school (the study included 17 out of a total of 40 industrial complexes in Korea in the industrial area group). Among 87 elementary schools in industrial area, 25 elementary schools (29%) were randomly selected. In each group except the industrial area, 10% of the elementary schools, of which the number of class was over 3, were randomly selected. Then, one class of each grade (among grades 3 through 5; 8-11 yr old) of each elementary school was randomly selected.	Rural/Urban	ISAAC Q	30 893	2006	8-11y 4944/13254 (37.3)	8-11y 5239/17639 (29.7)
Tai et al [S42]	Australia	The Children, Youth and Women's Health Service (CYWHS)(Child and Youth Health Campus) has a state-based community health service that routinely conducts a school entry health check for all preschool (4- to 5-year-old) children in South Australia.	U/NR	ISAAC Q	1509	2006	4-5y 181/772 (23.4)	4-5y 132/737 (17.9)
Tamay et al [S43]	Turkey	The number of primary school children attending Grade 1 in İstanbul was 211,446. Of those children, 5% from each district were planned to be included in the survey. The number of schools and children were calculated according to the number of children attending Grade 1 in each district.	Urban	ISAAC Q	9875	2004-2005	6-7y 1510/4972 (30.4)	6-7y 1370/4835 (28.3)
Wang et al [S44]	China	The questionnaires were distributed to children's	Rural/Urban	Other Q	4530	2010-	1-8y	1-8y

		parents through teachers in kindergartens in three districts (Shapingba, Jiulongpo, Yubei) that were randomly selected from 9 districts of Chongqing city. From the 54 randomly selected kindergartens (15 from Shapingba, 21 from Jiulongpo and 18 from Yubei), 7117 subjects (one parent per child aged from 1–8 years old) were selected.				2011	Weekly (2.9) Less common (43.0)	Weekly (3.2) Less common (44.5)
Wu et al [S45]	Taiwan	In total, 26418 students from 153 elementary schools in Taipei's12 administrative districts were investigated.	Rural/Urban	ISAAC Q	24 999	2007	6-7y (47.7)	6-7y (37.8)
Zhao et al [S46]	China	All primary schools in the Xuanwu District, Beijing and the Tianshan District, Urumqi were identified. Schools in the two districts were randomly recruited using the random number table until a sample size of around 3500 students in each city was obtained.	Urban	ISAAC Q	5818 (2978 (Beijing) + 2840 (Urumqi)	1996	6-7y 909/2842 (32.0)	6-7y 760/2618 (29.0)

PR; Prevalence of rhinitis; ISAAC: International Study of Asthma and Allergies in Childhood; Q: questionnaire; SPT: Skin prick test; M: male; F: female; U/NR: unclear/not reported