

questionnaire, producing a 91% response rate.

Because we had to extract some personal data from a previous national survey,¹⁸ the national identification card number for each student was the linking variable to the data set of our questionnaire study. The rate of successful linkage was about 83% (11,475 students) among the 13,764 respondents. The prevalence of allergic rhinitis is about 9.8%, and its associations with selected inherent factors, including next of kin with this disease, gender, and grade in school, are shown in Table 1. Since the grade in school is a surrogate of age, we categorized it into inherent variables. Other factors about the environment, including environmental passive smoking, air pollution, etc., are presented in Table 2. Characteristics of participants appear to be generally similar in general between boys and girls except for 1 factor, smoking habits of the study participants (data not shown).

Tables 3 and 4 present the crude and adjusted ORs for associations between allergic rhinitis and the risk factors of interest. By crude OR, reporting allergic rhinitis was strongly associated with whether the participant's next of kin had this disease. A crude OR of greater than 2 was seen between parental education of more than 9 years and the reporting of allergic rhinitis by their adolescent children. Other factors,

such as gender of the participants, degree of air pollution, the presence of standing water in the house, and domestic moldy growth, were also positively associated with reporting allergic rhinitis according to the crude OR. After multiple logistic regression, the variables retaining their statistical significance included the number of persons smoking at home, parental education of more than 9 years, and next of kin having had allergic rhinitis except for the maternal grandfather as shown in Table 3. A reduced model using multiple logistic regression without those variables whose *p* values were more than 0.05 is shown in Table 5. The resulting variables with statistical significance are next of kin reporting allergic rhinitis except for the grandfather on both sides, gender, number of persons smoking at home, subject smoking, and parental education of more than 9 years. Another reduced logistic regression model with interaction variables indicated that only gender and number of persons smoking at home had interaction effects with significance. The OR value for allergic rhinitis with 1 smoker at home and gender was 1.2 (95% CI = 1.0 - 1.4); and with more than 1 smoker at home and gender was 1.5 (95% CI = 1.2 - 1.9).

A trend test was performed to evaluate whether there was a linear increasing trend in these OR values

Table 3. Relative Risk of Allergic Rhinitis in Study Participants Based on Inherent Characteristics

Variable	OR*		(95% CI)	<i>p</i> value
	Crude	Adjusted		
Next of kin ever having had allergic rhinitis				
Maternal grandfather	5.1	1.3	(0.7, 2.3)	0.35
Maternal grandmother	5.9	2.1	(1.2, 3.9)	0.01
Paternal grandfather	5.8	1.7	(1.0, 2.8)	0.03
Paternal grandmother	6.9	2.8	(1.8, 4.5)	< 0.001
Father	7.7	4.1	(3.3, 5.1)	< 0.001
Mother	7.6	3.8	(3.0, 4.8)	< 0.001
Brother or sister	8.7	4.6	(3.8, 5.6)	< 0.001
Gender				
Male	1.5	1.9	(1.7, 2.3)	< 0.001
Year in junior high school				
2	1.0	1.1	(0.9, 1.3)	0.27
1	1.1	1.1	(0.9, 1.3)	0.57

* The reference groups are the same as those presented in Table 1. All adjusted ORs were adjusted with all variables presented in Tables 1 and 2.