

# Prevalence of asthma among teenagers attending school in Tahiti

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**SUMMARY** The prevalence of asthma was studied in 6731 adolescents (average age 13.5 years, 48.6% boys) attending school in three towns of the isle of Tahiti, according to the ethnic origin of *both* parents. The pupils completed a self-administered questionnaire in class; 14.3% gave an affirmative answer to the question "Have you ever had attacks of asthma?" (cumulative prevalence). That prevalence was 11.4% in the Europeans, 13.7% in the Chinese, 13.8% in the Polynesians, 15.3% in those whose parents were "halves" (half-bred from Polynesians and Europeans), and 16.0% in the miscellaneous group (= other origins) ( $P < 0.02$ ). Asthma was significantly more frequent in boys only among the Europeans and those with one European parent. The results of this study confirm the high prevalence of asthma in French Polynesia found in a previous study. They give no evidence of a racial difference in prevalence but suggest an influence of environment.

The object of this study was to assess the prevalence of asthma in Tahiti in 1984 according to ethnic origin.

## Population and methods

The population admitted to the study was composed of pupils attending school in Papeete, Pirae, and Faaa in public and private establishments of the elementary, secondary, and technical or vocational courses according to the following scheme:

- elementary courses: all pupils of the fifth grade
- secondary and technical courses: a representative sample of pupils, by random selection of classes (1/2) 6981 pupils were enrolled in these classes.\*

The data were collected by means of a self-administered questionnaire completed in class without any comments from the teachers. The completed forms were collected immediately. The questionnaire contained information about the pupils' civil status, their parents' ethnic origin and occupation, as well as questions on respiratory symptoms and history, and smoking habits. Asthma was defined as an affirmative answer to the question "Have you ever had attacks of asthma?" (cumulative prevalence according to the

epidemiological standardised definition used in previous studies<sup>1</sup>). For the statistical analysis, chi square and adjustment (Boyd and Doll) tests were used.

## Results

Of the 6981 pupils enrolled, 6731 (96.4%) were present on the day of the survey and completed the questionnaire. They were aged 10 to 19 (average age 13.5 years, standard deviation 2.5); 48.6% were boys. The ethnic origin was known for the parents of 6542 pupils. *Both* parents were Polynesians for 37.6% of the pupils ( $n = 2462$ ), Europeans for 14.7% ( $n = 965$ ), Chinese for 7.2% ( $n = 473$ ), and "halves" (half-bred from Polynesians and Europeans) for 8.5% ( $n = 557$ ). For the last 31.9% ( $n = 2085$ ) the father and the mother did not have the same ethnic origin, or they were of a different origin from the four mentioned: this class is labelled "miscellaneous" in the results. The proportion of smokers (at least one cigarette per day or ten per week) was 9.8%, with an average consumption of 6.0 cigarettes per day ( $\pm 5.3$ ). The question on asthma was answered by 6453 pupils. Among them the prevalence of asthma was 14.3%. It was higher in boys than in girls but was not related to age, as is shown in table 1. It was significantly related to ethnic origin: 11.4% in Europeans, 13.7% in Chinese, 13.8% in Polynesians, 15.3% in "halves", and 16.0% in the "miscellaneous" group ( $p < 0.02$ ). If

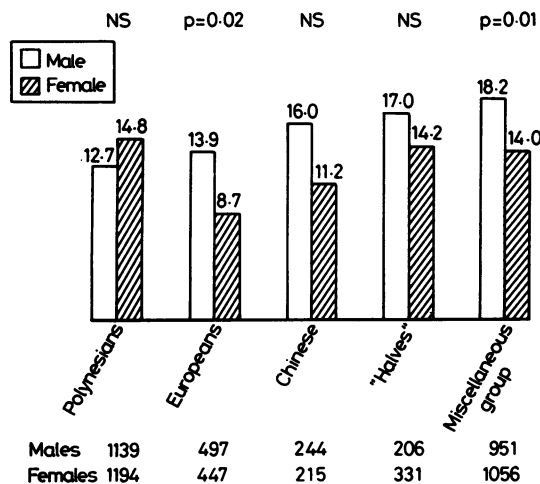
\* In Tahiti, school attendance is compulsory up to the 14th birthday, then it gradually decreases with increasing age: so the pupils aged under 14 represent practically all the children of their age groups, the 14–15 year old pupils represent three quarters, and the 14–17 year old pupils about one half of the corresponding teenagers.

**Table 1** Prevalence of asthma according to sex and age group

	Age (years)						
	Boys	Girls	<11	12-13	14-15	16-17	≥18*
% asthmatics	15.2	13.5	14.5	14.8	14.1	14.5	12.8
Number of asthmatics	476	449	231	264	194	160	53
Total number	3126	3324	1598	1783	1373	1104	415
Statistical test	p<0.05		N S				

\* Among the 200 pupils whose age was not known, 23 (11.5%) were asthmatics.

we take into account sex and ethnic origin simultaneously, the relation between asthma and ethnic origin is significant in both boys (p=0.01) and girls (p=0.02). By contrast, the relation between asthma and sex is statistically significant only among Europeans and "miscellaneous" (figure). In the latter class, which is not homogeneous, we have separated those with one European parent from the others: the



**Prevalence of asthma (%) according to sex and to ethnic origin of both parents**

relation between asthma and sex is significant in the former group (boys 20.5%, girls 13.7%: p=0.02) and non-significant in the latter (boys 16.8%, girls 14.2%).

The prevalence of asthma was related to neither smoking habits nor parents' socio professional status. To validate pupils' responses to the questionnaire we tested the relations usually found between, on the one hand, asthma and wheezing and usual cough and chronic cough, and, on the other hand, between respiratory symptoms and smoking habits as well as fathers' socio professional status. The prevalence of wheezing, of usual cough, and of chronic cough was significantly higher in asthmatics (table 2). The expected relations between respiratory symptoms and smoking habits appeared to be very significant: the frequency of usual cough was 27.0% in non-smokers and 39.6% in smokers (p<0.001), and the frequency of chronic cough was 14.1% in the former and 21.3% in the latter (p<0.001). The prevalence of wheezing was higher in smokers (26.2% v 18.8% - p<0.001). Usual and chronic cough were also significantly more frequent in the pupils belonging to the lowest socio professional categories: unemployed, manual workers, and, to a lesser extent, agricultural workers (table 3).

**Discussion**

In this study, the prevalence of asthma according to the epidemiological definition adopted (= 14.3%) was higher than that found in the previous studies carried out according to the same method of data collection. In the populations studied in France, that prevalence

**Table 2** Relations between asthma and respiratory symptoms

Prevalence of:	Non-asthmatics		Asthmatics		Statistical test
	%	n	%	n	
Wheezing	15.3	826	47.1	423	p<0.001
Usual cough	26.2	1407	43.5	393	p<0.001
Chronic cough	13.4	692	26.4	220	p<0.001

**Table 3** Prevalence of cough according to fathers' socioprofessional categories

Prevalence of:	Retired*	Managers	Intermediate professions	Clerks	Craftsmen/ tradespeople	Agricultural workers	Manual workers	Unemployed	
Usual cough									
%	22.8	23.2	23.5	27.8	26.4	28.0	33.0	36.6	p<0.001
n	26	152	175	381	144	51	666	74	
Chronic cough									
%	11.2	9.7	12.3	13.1	11.9	16.4	19.7	22.7	p<0.001
n	13	61	85	167	60	27	379	43	

\* Most often civil servants.

ranged from 4.1% in Bas-Rhin département in 1976<sup>2</sup> to 9.4% in Bordeaux and its surroundings in 1981.<sup>3</sup> The prevalence found in French Polynesia (Isle of Tahiti) in 1979 among 3870 teenagers attending school was 11.5%.<sup>4</sup> The increase between the previous and the present study cannot be explained either by the fact that the pupils' mean age was higher in the 1979 population or by the differences in the fathers' socio professional status (more often agricultural workers, craftsmen or tradesmen and less often employees in the previous study than in the present): in fact those factors were not related to the prevalence of asthma in either study. Only the geographic situation could influence that increase, as the present study population was more urbanised than the previous one (in Bas-Rhin in 1976 the frequency of asthma was higher in urban than in rural areas.<sup>1</sup>) But the increase in the prevalence of asthma is not an uncommon finding: it was found in the "Bas-Rhin" teenagers between 1976 and 1979<sup>5</sup> as well as in Parisian students.<sup>6</sup> Whatever the reason for that increase, the present study confirms that the prevalence of asthma is higher in Tahiti than in France. The study of that prevalence according to ethnic origin shows that although the children of European parents had the lowest prevalence, the children of "halves" (Europeans and Polynesians) and those of a "miscellaneous" origin had the highest prevalences. So it is difficult to formulate hypotheses on "racial" differences in prevalence. The differences observed might be ascribed to a different use of the term "asthma" by pupils from different ethnic groups, but the teenagers studied attended the same schools and were likely to have a common language. Moreover the validity of the date was tested as in our previous studies:<sup>1</sup> in all these studies, as well as in the present one, wheezing and cough were more frequent in asthmatics, and respiratory symptoms were related to smoking habits whereas asthma was not. Unfortunately, we do not know if the children of European origin had been born in Polynesia: among them there might have been a number of pupils who had recently immigrated and who had a lower prevalence, like the Negro children who migrated to Birmingham.<sup>7</sup> In this case, the role of geographical environment would be fundamental. The higher prevalence in boys that is often found in studies on asthma among children and teenagers<sup>2,3,8-10</sup> appeared in a statistically significant manner only among those of European and "miscellaneous" origin, but after division of the latter group into two sub groups, that relations was found only in the pupils with one

European parent. In the study carried out in Tahiti in 1979, the prevalence of asthma was the same in boys and girls. Again, it would be hasty to conclude from this that sex has an influence in some ethnic groups and not in others. Nevertheless it is interesting to see that, in a study carried out in Abidjan, Ossey Yapi found a significant relation between sex and the prevalence of asthma in Whites, whereas that prevalence was the same in Black boys and girls.<sup>11</sup>

In conclusion, this study confirms the high prevalence of asthma in French Polynesia: further studies are necessary to test the hypothesis of the influence of environment, allowing for genetic factors.

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