

A.V. Priftanji
E. Qirko
J.C.M. Layzell
M.L. Burr
R. Fifield

Original article

Asthma and allergy in Albania

Authors' affiliations:

A.V. Priftanji, E. Qirko, Clinic of Allergy and Clinical Immunology, University Hospital Center "Mother Teresa" of Tirana, Albania
J.C.M. Layzell, M.L. Burr, Centre for Applied Public Health Medicine, University of Wales College of Medicine, Cardiff, UK
R. Fifield, Supraregional Protein Reference Unit, Cardiff Royal Infirmary, Cardiff, UK

Correspondence to:

M.L. Burr
Centre for Applied Public Health Medicine
University of Wales College of Medicine
Temple of Peace and Health
Cathays Park
Cardiff CF1 3NW
UK

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Background: The risk of allergic disease may be influenced by the degree of "westernization". A survey was conducted to ascertain whether the prevalence of allergy was lower in Albania than elsewhere in Europe, as it has been the most isolated European country.

Methods: The subjects were residents of Tirana aged 20–44 years. A screening questionnaire was completed by 2653 subjects. A more detailed questionnaire was administered to a random sample of 564 respondents, together with skin prick tests and serum IgE assay.

Results: The prevalence of wheeze in the last year, and of wheeze without a cold, was lower in Albania than in any country that participated in the European Community Respiratory Health Survey. Nasal allergy and atopy (as indicated by serum specific IgE) were also uncommon in Albania, although serum total IgE concentrations were high.

Conclusions: The findings confirmed the hypothesis of a low prevalence of allergy in Albania. Possible reasons include the recent economic isolation of Albania, the infrequency of smoking by women, the lack of domestic pets, and the high incidence of childhood infection and parasitic infestation. The prevalence of allergy and its potential determinants should be monitored in Albania as that country acquires the characteristics of other parts of Europe.

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The prevalence of asthma and other atopic disorders has risen markedly over recent decades in many countries, for reasons that are still unclear (1). There are substantial differences in asthma prevalence among various countries (2, 3); the cause of these differences is unknown, but it seems to be partly related to the degree of "westernization" of the population. Albania is exceptional among European coun-

Table 1. Prevalence of symptoms in last 12 months according to screening questionnaire

Symptom*	Men (n=1260)		Women (n=1393)		All subjects (n=2653)	
	No.	%	No.	%	No.	%
Wheeze [1]	76	6.0	102	7.3	178	6.7
Wheeze with breathlessness [1.1]	58	4.6	88	6.3	146	5.5
Wheeze without cold [1.2]	30	2.4	49	3.5	79	3.0
Woken by breathlessness [3]	85	6.7	139	10.0	224	8.4
Attack of asthma [5]	16	1.3	40	2.9	56	2.1
Current treatment for asthma [6]	8	0.6	32	2.3	40	1.5
Nasal allergy [7]	132	10.5	198	14.2	330	12.4

*Question number in ECRHS screening questionnaire shown in square brackets.

tries in having many of the characteristics of a developing country. It is likely to change during the next few years, as the population begins to acquire something of the lifestyle of neighbouring areas. A survey of asthma and allergy was therefore set up with two objectives: firstly, to compare the prevalence in Albania with that in other countries (the hypothesis being that it would be lower in Albania); and, secondly, to establish a baseline so that changes can be monitored in the future.

The study used a simplified version of the protocol of the European Community Respiratory Health Survey (ECRHS) (4), so that the findings could be compared with those obtained in that survey while accommodating local conditions.

Material and methods

The subjects were residents of the administrative district of Tirana (total population 250 219 in 1992) who were aged 20–44 years. The sampling frame was the electoral register that was drawn up in 1992, and a random sample of 60 electoral wards was drawn from the 224 wards in Tirana. Within the selected wards, a random sample was chosen of persons who were aged 20–44 years in December 1994. The consent of the local ethics committee was obtained, and the survey was conducted during 1995 and 1996.

The questionnaires were translated from the ECRHS originals into Albanian and independently back-translated into English; the Albanian versions were then corrected accordingly. The design of the study was broadly that of the ECRHS, except that spirometry and methacholine challenge were not performed. A short screening questionnaire was distributed to a random sample of the population of the

specified age, enquiring about certain respiratory symptoms in the last 12 months, including wheezing, attacks of breathlessness, and asthma. This questionnaire also asked whether any treatment was currently being taken for asthma, and “Do you have any nasal allergies including ‘hay fever’?” The questionnaires were delivered by hand and completed on the spot, or left to be collected a few days later.

A random subsample of the respondents was asked to participate in a more detailed enquiry, involving administration of a longer questionnaire, skin prick tests for certain allergens, and blood tests for total and specific IgE. Similar investigations were conducted in all other subjects who reported certain symptoms in the screening questionnaire, but their results are not reported here. A further difference from the ECRHS procedure was the use of liquid antigen (supplied by SmithKline Beecham Pharmaceuticals) rather than precoated lancets. The fieldworkers were trained and their skin test results were monitored according to the ECRHS protocol. The allergens for the skin tests were house-dust mite (*Dermatophagoides pteronyssinus*), cat, grass pollen, *Alternaria*, *Cladosporium*, *Parietaria*, olive, ragweed, *Artemisia*, and *Betula*. A wheal of 1 mm or more was regarded as a positive reaction, in accordance with ECRHS recommendations (5). The blood samples were transported frozen to a laboratory in Cardiff, where the IgE assays were performed with the Pharmacia CAP System; specific IgE was tested for mite, timothy grass, cat, *Parietaria*, and olive.

Results

There were 3670 subjects aged 20–44 years, randomly selected from 60 electoral wards, who appeared to be eligible

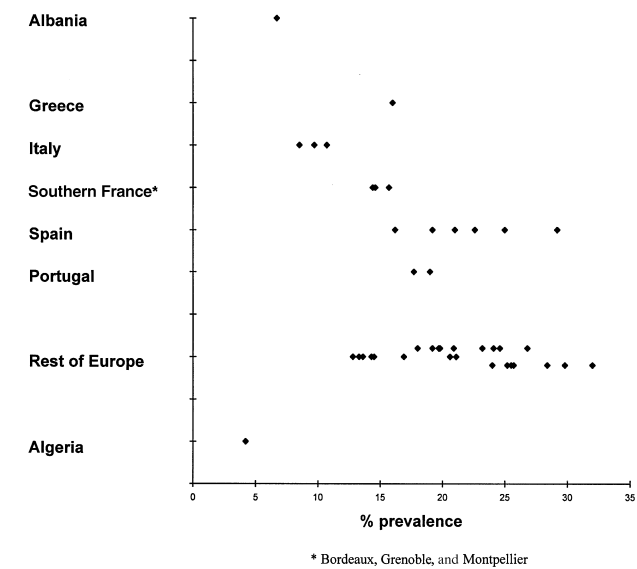


Figure 1. Prevalence of wheeze in last 12 months in Albania and certain ECRHS centres (2).

for the survey. Of these, 2653 (72.3%) completed the screening questionnaire; this is an underestimate of the response rate, since many subjects had emigrated since the electoral register was compiled, and some addresses could not be located, so that the true denominator is not known. Table 1 shows the prevalence of various symptoms derived from the screening questionnaire. Being woken by breathlessness was the commonest symptom suggestive of asthma; only a quarter of these subjects reported an attack of asthma, and even less were receiving treatment for asthma. Nasal allergy was reported more often than wheezing or waking with breathlessness. All these symptoms had a higher prevalence in women than in men.

The prevalence of some of these symptoms was compared with that in countries that participated in the ECRHS (2). Fig. 1 shows the prevalence of wheeze in the last 12 months in Albania and the European ECRHS countries (some of which conducted the survey in more than one place); centres in southern Europe are shown separately, and the Algerian centre (Algiers) is also shown, as it has a Mediterranean location. The prevalence of wheeze was lower in Albania than in any other European centre, but slightly higher than that in Algeria; the next lowest prevalence rates were in the three Italian centres, all in northern Italy. The prevalence of nasal allergy in Albania was among the lowest in Europe, although it was lower still in Algeria (Fig. 2).

The random subsample selected for further investigation comprised 598 subjects, of whom 564 (94.3%) were actually seen. Table 2 shows the prevalence of current tobacco smoking among these subjects classified by age. At all ages,

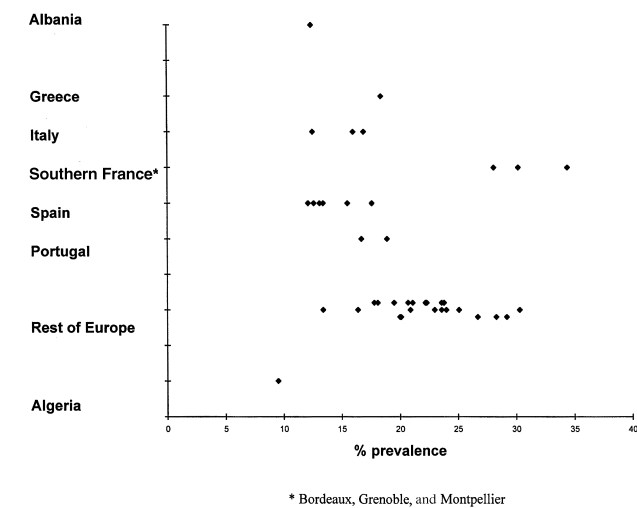


Figure 2. Prevalence of nasal allergy in Albania and certain ECRHS centres (2).

smoking was far more common in men than in women. There was no obvious trend with age among the men, but in women the prevalence was highest in the oldest group. Smoking status was not recorded for one woman.

Table 3 shows the prevalence of certain symptoms that were addressed in the detailed questionnaire. Subjects with “chronic cough” are those who answered “Yes” to both the following questions:

- “Do you *usually* cough during the day, or at night, in the winter?”
- “Do you cough like this on most days for as much as 3 months each year?”

Similar questions defined “chronic phlegm”. These two symptoms were much more commonly reported by men than by women, whereas continuous breathing trouble, asthma ever, and eczema ever were reported to a similar extent by men and women.

Table 2. Prevalence of current smoking by age group

Age group (years)	Men		Women		All subjects	
	Total no.	Smokers no. (%)	Total no.	Smokers no. (%)	Total no.	Smokers no. (%)
20–24	35	14 (40)	44	0 (0)	79	14 (18)
25–29	37	24 (65)	65	1 (2)	102	25 (25)
30–34	68	30 (44)	69	5 (7)	137	35 (26)
35–39	62	27 (44)	75	4 (5)	137	31 (23)
40–44	46	15 (33)	62	10 (16)	108	25 (23)
All ages	248	110 (44.4)	315	20 (6.3)	563	130 (23.1)

Table 3. Prevalence of certain symptoms in random subsample

Symptom	Men (n=248)		Women (n=316)		All subjects (n=564)	
	No.	%	No.	%	No.	%
Chronic cough	36	14.5	23	7.3	59	10.5
Chronic phlegm	55	22.2	23	7.3	78	13.8
Constant breathing trouble	5	2.0	5	1.6	10	1.8
Asthma ever	10	4.0	14	4.4	24	4.3
Eczema ever	25	10.1	39	12.3	64	11.3

The results of the skin tests are shown in Table 4. The house-dust mite was by far the allergen to which most people were sensitized, followed by grass pollen. Reactions to other allergens occurred in less than 5% of subjects. Among the 564 people seen, 58 (10.3%) owned a cat, 44 (7.8%) owned a dog, and 14 (2.5%) owned a bird.

Serum total IgE was measured in 229 men and 284 women. The geometric mean concentrations were 93 and 72 kU/l, respectively (81 kU/l overall). Tests for specific IgE for five allergens were performed on 502 serum samples, and the results are shown in Table 5. Mite was the allergen to which specific IgE antibodies most frequently occurred, followed by timothy grass.

Discussion

This is the first respiratory survey of adults to be conducted in Albania. The results allow comparisons to be made with data obtained in other countries, and they provide a baseline so that changes can be detected in the future as Albanians

Table 4. Prevalence of positive skin prick tests to individual allergens

Allergen	Subjects with positive skin tests (n=564)	
	No.	%
House-dust mite	104	18.4
Cat	16	2.8
Grass pollen	30	5.3
<i>Alternaria</i>	17	3.0
<i>Cladosporium</i>	16	2.8
<i>Parietaria</i>	14	2.5
Olive	19	3.4
Ragweed	17	3.0
<i>Artemisia</i>	22	3.9
<i>Betula</i>	15	2.7
Any of these	169	30.0

Table 5. Prevalence of specific serum IgE to certain allergens

Allergen	Subjects with specific IgE (n=502*)	
	No.	%
House-dust mite	76	15.1
Timothy grass	51	10.2
Cat	10	2.0
<i>Parietaria</i>	38	7.6
Olive	38	7.6
Any of these	114	22.8

*501 specimens tested for cat, *Parietaria*, and olive.

adapt to new political, economic, and cultural conditions. The survey took place in Tirana so as to be comparable with the ECRHS, which was mostly conducted in towns of at least 150 000 inhabitants. Therefore, the findings do not necessarily apply to the population of the rural parts of Albania. Tirana has a Mediterranean climate, humid in spring and autumn, hot and dry in summer, and mild in winter. Since 1992, there has been some air pollution from an influx of diesel-fuelled cars, but little from industrial sources.

The response rate for the first part of the survey cannot be given precisely, owing to uncertainties about the denominator. A substantial movement of population out of Tirana occurred after the 1992 electoral register was compiled, and the apparent response rate of 72.3% was an underestimate of the true figure. The second part of the survey yielded a response of 94.3%, and it seems reasonable to believe that the participants were representative of young adults living in Tirana.

The most striking finding is perhaps the low prevalence of symptoms in comparison with rates in other European countries. Wheeze in the past year (and wheeze without a cold) was less commonly reported in Albania than in any other European country (2). Although it is difficult to exclude altogether the possibility of an artefact of translation, this is unlikely to be the whole explanation, since the prevalence of wheeze tended to be low in other southern European countries (Italy, southern France, and Greece), and it was lower still in Algeria. Asthma attacks and currently treated asthma were less frequently reported in Albania than in most other European centres (2); moreover, the prevalence of nasal allergy was low in Albania and Algeria, and fairly low in Italy, Spain, Portugal, and Greece, in comparison with the rest of Europe. It seems that allergic symptoms tend to affect a smaller proportion of the population in

Mediterranean countries than in other parts of Europe. Similar findings have emerged from the International Study of Asthma and Allergies in Childhood (ISAAC). This showed that, among 56 participating countries, the mean prevalence of asthma symptoms in 13–14-year-old children was lower in Albania than anywhere else except Indonesia; it was lowest in Albania among the countries that used a video questionnaire, so this position was not a linguistic artefact (3). Albania also had the lowest prevalence of symptoms of allergic rhinoconjunctivitis and of atopic eczema in that survey.

The question arises as to why allergic diseases are relatively uncommon in Albania, among children and young adults. The explanation may lie in some aspect of Mediterranean life – for example, the high consumption of fresh fruit, since dietary antioxidants have been suggested as possibly conferring protection against allergy (6). Paradoxically, despite its poverty and high infant mortality rate, Albania has adult death rates that are comparable with those of its wealthier neighbours, with a life expectancy at age 15 years that is similar to that in other European countries, and the high intake of fruit and olive oil could account for the health of its adult population (7). Alternatively, there could be some adverse factor in the “western” lifestyle from which Albanians have hitherto been shielded by the isolation of their country. It is noteworthy that the prevalence of allergic asthma and of specific serum IgE antibodies is low in Estonia, another formerly socialist country, in comparison with Sweden (8). Studies in the former East and West Germany suggest that the prevalence of atopy and allergic disease was lower in the east until the reunification of the country but may now be converging with that in the west (9, 10). Relevant aspects of the western lifestyle may include housing conditions, pet ownership, diversity of foods, automobile exhaust emissions, and travel (11). Clearly, the prevalence of allergic disease (and of other conditions characteristic of western countries) should be monitored in Albania as its inhabitants increasingly acquire western ways.

The frequency of pet ownership was much lower in Albania than in other European countries. For example, surveys of children in the UK and Sweden have reported cat ownership in 28.5% and 22.7%, respectively, compared with 10.3% in this survey, with similar or greater disparities in the proportions keeping dogs and birds (12). It seems most unlikely that this is attributable simply to the difference in age group. Cat and dog antigens are important allergens in relation to clinical disease, and are widely dispersed within the community (13). The relative infrequency of pet own-

ership in Albania may contribute to the low prevalence of allergic disease there.

The relative importance of allergy to house-dust mite (as shown by both skin and serum tests) is striking. In most countries, grass-pollen allergy is nearly as important as mite allergy or still more so, but in Albania its frequency was very much lower. Cat allergy was even less common, reflecting the low prevalence of cat ownership and consequent lack of exposure of the population to cat antigen. Apart from grass, the pollens with the highest frequencies of positive reactions were *Artemisia* and olive, which are known to provoke allergic symptoms in Mediterranean countries (14). Serum specific IgE appeared to be a more sensitive indicator than skin tests for allergy to grass, *Parietaria*, and olive.

Objective evidence confirming the low prevalence of atopy in Albania is provided by the serum tests. The prevalence of atopy, as defined by specific IgE to any of the allergens tested, was 23%, placing Albania in the lowest quarter of atopy prevalence in the ECRHS (15). It is noteworthy that this quarter included Greece and some of the Italian and Spanish centres. The selection of allergens was nearly but not quite identical: *Cladosporium* was included in the ECRHS, but not in the Albanian survey. The skin tests showed that allergy to olive (included in the Albanian, but not the ECRHS, specific IgE tests) was more common than allergy to *Cladosporium* in Albania; therefore, the substitution is most unlikely to have reduced the relative prevalence artificially. The prevalence of mite-specific IgE was in the second lowest quarter of the ECRHS distribution; grass-specific IgE was in the lowest quarter, while cat-specific IgE was less common than in any ECRHS centre. In contrast, the geometric mean total IgE concentration was higher than that in any country participating in the ECRHS (15). The ECRHS country with the highest overall geometric mean IgE was Greece, so that Albania shares with its neighbour Greece a low prevalence of asthma, allergic diseases, and atopy, and a high serum total IgE. This association may reflect exposure to parasitic worms and *Giardia*. There is evidence to suggest that some protection against allergic diseases is conferred by helminth and other parasitic infections, despite the increase in IgE that they provoke, and also by other childhood infections (16). Among Italian military students, the prevalence of atopy (whether defined by skin tests or by specific IgE) was lower in those who had serum antibodies to hepatitis A virus than in those who did not, suggesting that childhood infections consequent on poor hygiene may reduce the risk of atopy (17). The high incidence of infections in childhood, reflected in the high infant mortality rate (7), may thus be at least a part of

the reason for the low prevalence of allergic diseases in Albania.

Among the lifestyle factors that may change with “westernization” is cigarette smoking. The prevalence of smoking was 44% in men, with little variation across the age band in this survey, but only 6% in the women. The virtual absence of smoking in young women is in particular contrast to the pattern found in western Europe, although the prevalence may be underestimated, owing to possible reluctance to admit smoking. The excess prevalence of chronic cough and phlegm in men compared with women reflects the difference in smoking habits. Current symptoms of asthma were more common among women, however, and the lack of a sex difference for “constant breathing trouble” may represent a combination of two opposite tendencies. Maternal smoking has been implicated as a risk factor for asthma in some studies (18, 19), so the relative infrequency

of cigarette smoking in Albanian women could be a factor in the low prevalence of asthma in that country.

It is clear that the prevalence of allergy in Albania is low compared with that in most other European countries. If the situation is monitored as the country undergoes rapid changes, clues may emerge about the causes of its relative freedom from allergic diseases hitherto and the increases that have occurred elsewhere.

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