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Obstructive lung disease in northern Sweden: respiratory symptoms assessed in a postal survey

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Obstructive lung disease in northern Sweden: respiratory symptoms assessed in a postal survey. B. Lundbäck, L. Nyström, L. Rosenhall, N. Stjernberg.
ABSTRACT: The prevalence of respiratory symptoms in 6,610 adults (3,372 men and 3,238 women); 35–36, 50–51 and 65–66 yrs of age, living in selected areas of Norrbotten, northern Sweden, were assessed in a postal survey. Response rates were identical in men and women, and at least one respiratory symptom was reported by 41% of each sex. Twenty two percent reported sputum production, and 14% reported wheezing. Despite differences in smoking habits and in the different age groups, the prevalence of symptoms did not differ between the sexes, or between urban and rural areas. Symptoms were as common in people living in the rural interior as in the industrialized coastal area. Present or past history of asthma was reported by 323 (5.9%) subjects, whilst 234 (4.1%) subjects stated that they had chronic bronchitis or emphysema. Less than half of the subjects who reported attacks of breathlessness together with wheezing stated that they had at any time had asthma. Whilst the exact prevalence of had asthma. Whilst the exact prevalence of at any time had asthma and chronic bronchitis cannot be assessed from this postal survey, its results indicate that the prevalence of asthma may be higher in northern Sweden than has been reported from the south of Sweden.
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Morbidity and mortality from bronchial asthma have increased in several countries [1–4] but it is not clear whether this is due to a true increase in the prevalence of bronchial asthma [5–7]. Morbidity in asthma also appears to have increased in Sweden; the sales of anti-asthmatic drugs increasing by 74% in the 10 yrs from 1977 to 1986, with a more marked increase in northern Sweden [8]. Asthma mortality in Swedish men has remained relatively constant since 1970, but has increased slightly in women [9]. Despite a relatively low prevalence of asthma in Sweden, mortality is greater than in Denmark and other neighbouring countries [10–12].

Between 1971 and 1981, the prevalence of asthma and allergic rhinitis in Swedish conscripts increased, particularly in the north of the country [13]. School children in the north of Sweden also have a higher prevalence of asthma than those in the south [14, 15]. Between 1974 and 1981, the prevalence of asthma in adults in an industrial community in north Sweden increased from 3.1 to 3.6% [16, 17].

Whilst the prevalence of chronic bronchitis is relatively low in Sweden [18–20], the mortality from chronic bronchitis and emphysema has increased by 50% between 1970 and 1986 [9].

We wanted to assess the prevalence of respiratory diseases in Norrbotten, the northernmost province of Sweden. As a first step, we assessed the prevalence of respiratory symptoms, and their relationship to demographic data, from a questionnaire sent to a cross-section of the population.

Subjects and methods

Study area

Norrbotten is Sweden's northernmost province, situated at latitude 65.4–69.4°N and bisected by the Arctic Circle, making up 24% (105,886 km²) of Sweden's area. In December 1985 it had 262,301 inhabitants, less than 3% of Sweden's population; the majority of whom live in the coastal region, where most of the large towns and industries are located. The average yearly temperature is close to 0°C, with cold, dry winters that last for 6 mths. February is the coldest month with an average daily temperature of -12°C.

In this study, eight geographical areas of the province were chosen, including three coastal and five inland areas (fig. 1). Table 1 shows the characteristics of these areas. This sample includes both urban and rural districts, with varying population densities and degrees of industrialization.

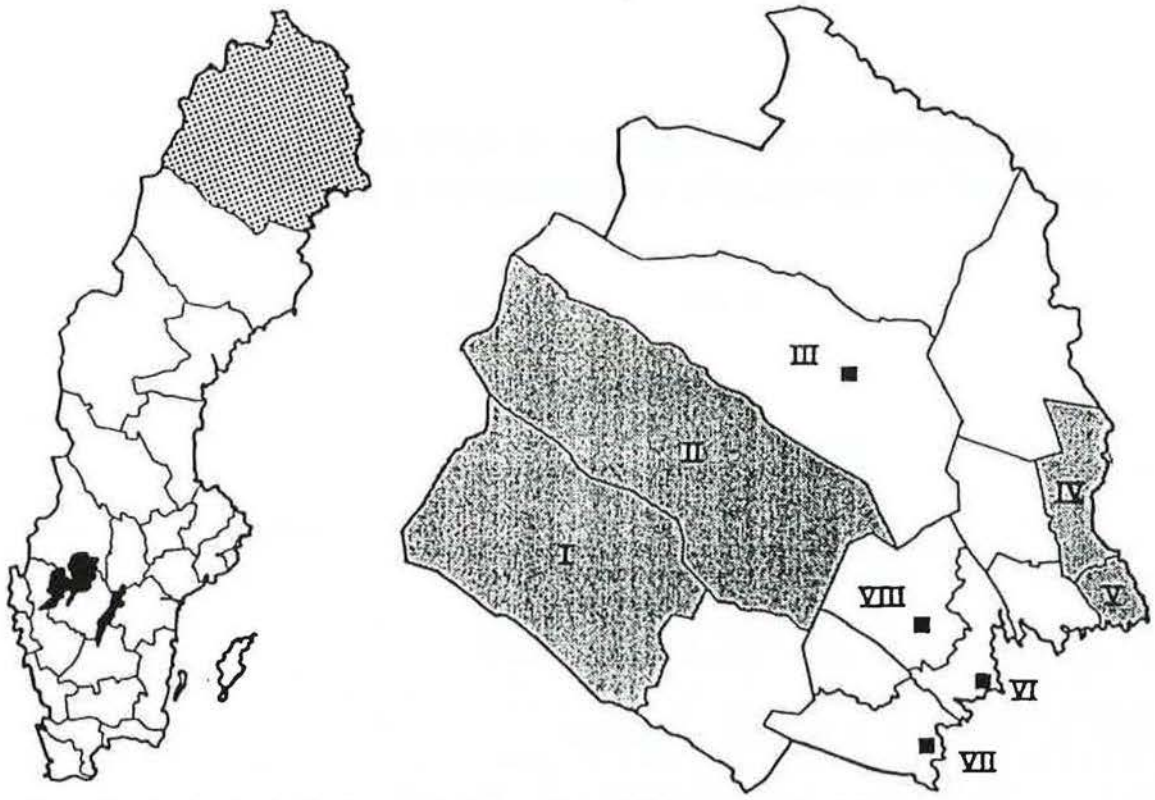

Fig. 1. – Map of Sweden showing the Province of Norrbotten with the eight study areas. The study populations from areas I, II, IV and V were drawn from the whole municipality (kommun), while those from areas II, VI, VII and VIII were from the towns and their immediate surroundings, only.

Table 1. – Characteristics of the study areas

Area no.	Municipality	No of inhabitants 31/12/1985	Type of settlement	Type of industry	Air pollution sources	Average annual temperature	Duration of winter in days
I	Arjeplog	3927	D S	Mining Forestry	-	-0.3	190
II	Jokkmokk	6893	D S	Forestry Hydroelectric Power	-	-0.7	193
III	Malmberget	10465	T	Mining	-	-1.0	197
IV	Övertorneå	6181	D S	Farming Forestry	-	+0.7	185
V	Haparanda	9943	T S	Farming Commercial Metal**	Metal**	+1.6	176
VI	Luleå*	22960	T	Steel	Steel Coke	+2.0	172
VII	Piteå*	15912	T	Wood Paper-pulp Paper	Paper-pulp	+2.4	169
VIII	Boden*	11035	T S	Commercial	-	+1.0	180

* Part of; ** in Finland, close to the town of Haparanda; T: town; D: densely populated area; S: sparsely populated area.

Study population

Norrbotten's inhabitants are mainly from three ethnic groups: 1) the majority are Swedish; 2) about 40,000, mostly living in the east of the province, close to the Finnish Border in the Tornio River Valley, have Finnish as their mother tongue; and 3) Lapplanders. As there are no ethnic registers in Sweden, the numbers of people in each ethnic group are only estimates.

In December 1985, the population of the eight study areas was 87,316, or approximately one-third of Norrbotten's population. Three age cohorts were selected for the study: all 6,610 individuals born in 1919–1920, 1934–1935 and 1949–1950. These age groups were chosen in order to clarify differences in symptoms and diseases in different age cohorts. In addition, we wanted to have well-defined large cohorts for future longitudinal studies.

Three quarters (75%) of the study sample live in urban areas and 15% live in rural areas. Fifty three percent live in the coastal area and the remainder in inland districts. Table 2 shows the distribution of the sample by year of birth, sex and geographical area.

Table 2. – Distribution of the study population, studied in 1985–1986, by year of birth, sex and geographic area

	Year of birth							
	1919–1920		1934–1935		1949–1950		Total	
Study area	M	F	M	F	M	F	M	F
I	52	44	49	45	45	31	146	120
II	83	86	64	78	122	91	269	255
III	80	64	162	106	179	151	421	321
IV	79	88	65	65	96	62	241	215
V	99	112	105	85	143	152	347	349
VI	156	137	272	227	446	404	874	768
VII	149	169	200	257	240	234	589	660
VIII	186	217	123	156	176	177	485	550
Total	884	917	1041	1019	1447	1302	3372	3238

Questionnaire

The questionnaire used was a revised version of one that had previously been used in northern Sweden [17] which was based on the Medical Research Council (MRC) questionnaire [21]. It was sent to all the subjects during the winter of 1985–1986. Those who did not respond within 6–8 wks were sent a reminder and a second questionnaire in both Finnish and Swedish.

Questions about symptoms: attacks of breathlessness, longstanding cough, sputum production, wheezing and diagnoses required either "yes" or "no/don't know" answers. Other questions enquired whether breathlessness, wheezing or severe cough occurred after specific exposures or in certain situations; dust or tobacco smoke, car-exhaust fumes or air pollutants, strong scents and perfumes, or on exercise in the cold. Subjects were also asked whether they had been diagnosed by a physician as suffering from bronchial asthma, chronic bronchitis or emphysema and whether they considered themselves to have any of these conditions. Smoking habits were assessed: subjects who had never smoked were classed as nonsmokers, those who currently smoked or had stopped smoking within the 12 mths prior to the survey were classified as smokers. Subjects who had stopped smoking more than 12 mths previously were classed as ex-smokers.

Statistical methods

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS), at the Department of Epidemiology and Community Health and the Computer Centre (UMDAC), University of Umeå. Bivariate comparisons were performed by Chi squared analysis. When studying the association between, for example, area of domicile and the presence of a respiratory symptom, it is necessary to take the influence of other variables such as smoking habits, sex, *etc.* into account. In this study, this was achieved by the use of logistic linear regression analysis [22].

The probability of a symptom or a disease was estimated as a function of smoking (smokers = 3, ex-smokers = 2, nonsmokers = 1); population density (town = 3, densely built-up area = 2, sparsely built-up area = 1), coastal (1), inland (0); age (1919–1920 = 3, 1934–1935 = 2, 1949–1950 = 1); women (1), men (0), by use of a logistic model.

The probability of a symptom or a disease is: $1/(1+\exp(-S))$, where the sum, S, is a linear combination of the variables studied. S represents $\beta_1 x_1,...\beta_2 x_5$ + constant, where $x_1,...x_5$ are the values of the variables age, *etc.*, and $\beta_1,...\beta_5$ are constants.

Results

Participation

Of the 6,610 subjects in the study sample, 5,979 (90.5%) returned the questionnaire. However, 281 (4.7%) were incompletely filled in and were excluded. The remaining 5,698 (86.2%) questionnaires made up the study material. Similar proportions of men and women returned questionnaires and there was little difference in response rates between the three age cohorts. The response rate varied from 81 to 91% in the eight geographical areas.

Smoking habits

Almost all (98.5%) of the 5,698 subjects had answered questions on smoking habits (table 3). The proportion of smokers was greater in the towns than in rural areas (33 *vs* 27%), and decreased with age. More men than women smoked (34 *vs* 30%, $p<0.001$), despite the fact that a larger number of young women than young men smoked.

Table 3. – Prevalence (%), in 1985–1986, of respiratory symptoms by year of birth, sex and smoking habits and distribution of smoking habits in percent by year of birth and sex (internal response rate = 1.5%)

Respiratory symptoms	Smoking habits	Year of birth 1919–1920 M	1919–1920 F	1934–1935 M	1934–1935 F	1949–1950 M	1949–1950 F	Total M	Total F
Cough	Nonsmokers	4.6	13.2	7.2	10.1	5.9	8.4	6.0	10.7
	Ex-smokers	10.9	8.6	7.4	8.7	4.9	6.5	7.9	7.6
	Smokers	11.8	10.5	17.5	16.7	13.5	10.7	14.5	12.6
	All	9.2	12.4	10.9	11.7	8.8	8.9	9.5	10.8
Sputum production	Nonsmokers	15.5	22.1	16.7	16.0	12.3	14.7	14.4	17.6
	Ex-smokers	30.1	16.3	17.4	15.9	14.8	9.7	20.8	15.3
	Smokers	38.0	33.0	31.8	30.0	30.1	26.2	32.2	28.2
	All	27.3	24.7	22.1	20.3	19.9	18.3	22.5	20.5
Wheezing	Nonsmokers	10.2	12.7	8.8	8.6	8.0	6.3	8.8	9.3
	Ex-smokers	21.5	20.7	10.9	10.2	10.8	6.6	14.5	10.5
	Smokers	23.8	16.5	25.4	27.0	15.8	16.9	10.4	20.1
	All	18.5	14.2	15.2	14.3	11.9	10.6	14.6	12.7
Attacks of breath-lessness	Nonsmokers	9.4	12.1	5.9	10.8	8.7	9.4	8.0	10.9
	Ex-smokers	17.8	16.0	12.6	16.4	9.2	8.2	13.3	12.2
	Smokers	12.4	13.3	14.4	19.7	8.3	10.5	11.5	13.8
	All	13.6	12.8	11.0	14.3	8.8	9.6	10.7	12.0
Any respiratory symptom	Nonsmokers	31.9	43.2	38.2	37.5	29.9	31.8	33.0	37.9
	Ex-smokers	49.8	43.2	36.0	41.7	34.0	30.6	40.3	36.7
	Smokers	53.8	40.6	51.7	50.9	48.0	44.0	50.4	45.8
	All	45.0	42.8	42.0	42.0	37.9	36.6	41.1	40.0
Cough	Nonsmokers	32.2	71.1	33.1	54.1	36.1	38.2	34.1	52.3
	Ex-smokers	42.2	14.8	32.1	15.6	24.4	21.1	31.7	17.6
	Smokers	25.6	14.1	34.8	30.3	39.5	40.6	34.3	30.1
	All	782	764	922	904	1202	1124	2906	2792

Respiratory symptoms

More than one-third (2,312 subjects, 41%) reported respiratory symptoms, with little difference in report rate in men and women or between urban or sparcely-populated areas. The prevalence of respiratory symptoms varied from 37% in Area VIII to 45% in Area II. The prevalence of respiratory symptoms by year of birth, sex and smoking habit is reported in table 3. All respiratory symptoms except cough increased with age ($p<0.001$). The most commonly reported symptoms were sputum production (22%) and wheezing (14%). Of the sample, 6.7% reported that they had attacks of both breathlessness and wheezing. The simultaneous occurrence of cough and sputum production was reported by 6.8% of subjects. Attacks of breathlessness, wheezing or severe cough was reported after exercise in cold weather by 21% of subjects, after exposure to dust and smoke by 22%, to car-exhaust fumes and air pollution by 16% and to scents or perfumes by 17%.

There was a strong association between smoking and longstanding cough, sputum production, wheezing, respiratory symptoms during exercise in cold weather ($p<0.0001$) and attacks of breathlessness ($p<0.001$). There was a weak association between smoking and respiratory symptoms due to exposure to car-exhaust fumes and air pollution ($p<0.05$) but no assocation between smoking and respiratory symptoms on exposure to strong scents or perfumes. Smokers had significantly less symptoms than nonsmokers when exposed to dust and smoke ($p<0.001$). Nonsmoking women in the oldest cohort reported cough in 13.2% and sputum production in 22.1%.

Breathlessness, wheezing, cough and sputum production, as well as the combinations of breathlessness and wheezing or cough and sputum production were all

Table 4. – Prevalence (%) of different respiratory symptoms in the three age cohorts by type of settlement and by geographical region

Symptom	Year of birth	Type of settlement T	D	S	Inland	Coastal	Total
Cough	1919–1920	10.5	9.9	12.1	11.2	10.2	10.8
	1934–1935	11.0	11.4	12.8	11.0	11.5	11.3
	1949–1950	9.1	8.1	8.1	8.8	8.9	8.8
	All	10.1	9.6	11.1	10.3	10.0	10.1
Sputum product	1919–1920	26.3	26.2	25.4	27.6	24.2	26.1
	1934–1935	22.1	18.1	18.4	22.0	20.5	21.2
	1949–1950	18.4	21.7	21.2	18.3	19.7	19.1
	All	21.4	21.7	22.0	22.3	20.9	21.6
Wheezing	1919–1920	16.3	18.6	16.1	17.4	15.3	16.4
	1934–1935	15.0	14.8	13.2	15.3	14.3	14.7
	1949–1950	10.8	14.7	10.7	12.5	10.4	11.3
	All	13.4	15.7	13.6	14.9 *	12.7	13.7
Attacks of breath-lessness	1919–1920	12.9	13.7	13.8	12.6	13.9	13.2
	1934–1935	12.4	12.6	14.0	13.1	12.2	12.6
	1949–1950	8.8	10.9	10.1	9.6	8.8	9.2
	All	11.0	12.1	12.7	11.8	11.1	11.3
Any respiratory symptom	All	40.0	42.6	42.4	41.6	39.7	40.6

*: $p<0.05$; T: town; D: densely populated area; S: sparsely populated area.

somewhat more common in inland than in coastal areas; but only wheezing was significantly more common ($p<0.05$) (table 4).

One percent (33 subjects) of those who stated that they had no respiratory symptoms claimed to have or have had asthma or chronic bronchitis, or stated that a physician had diagnosed them as having one of these diseases.

Asthma

Nearly 6% (323 subjects) of the 5,483 subjects who answered this question stated that they had at some time had asthma (table 5), with no variation between coastal and inland areas. Attacks of breathlessness were reported by 80% of the 323 subjects, wheezing by 63%, attacks of breathlessness and wheezing combined by 57%, cough by 28% and sputum production by 52%. Asthmatic symptoms or severe cough were reported to occur after exercise in cold weather by 74%, after exposure to dust and smoke by 66%, after exposure to car-exhaust fumes and air pollution by 53%, and after exposure to scents or perfumes by 55%. Eighty percent reported that a doctor had diagnosed their asthma. Of the 323 subjects who claimed to have had asthma at some time, 20% (65 subjects) stated that they also had chronic bronchitis diagnosed by a physician. While 290 (5.1%) of respondents were taking anti-asthmatic drugs, 200 of the 323 (62%) used them.

Obvious local variations exist in the prevalence of self-reported asthma and in the prevalence of attacks of breathlessness and wheezing (fig. 2). Forty eight percent of people who said they had attacks of breathlessness and wheezing together claimed that they had at some time had asthma. There was no association between smoking and bronchial asthma.

Chronic bronchitis

Four percent (230 subjects) of the 5,468 subjects who answered the question reported that they had at some time had chronic bronchitis (table 5). Thirty five percent of these 230 subjects were taking anti-asthmatic drugs, 68% were smokers or ex-smokers, 72% reported that their chronic bronchitis had been diagnosed by a physician and 10% stated that they also had emphysema. Emphysema was only reported by 26 subjects, only four of whom did not simultaneously report chronic bronchitis.

Table 5. – Frequency (%) of positive answers to questions on present or earlier bronchial asthma or chronic bronchitis, and physicians' diagnosis of bronchial asthma or chronic bronchitis

	Year of birth							
	1919–1920		1034–1935		1949–1950		Total	
Question	M	F	M	F	M	F	M	F
Have you, or have you had bronchial asthma?	7.0	7.3	4.1	6.3	6.0	5.1	5.7	6.1
Have you, or have you had chronic bronchitis?	7.8	5.6	4.9	4.0	1.5	2.4	4.3	3.8
Have you been diagnosed as having bronchial asthma by a physician?	6.1	6.4	3.9	5.8	4.8	4.1	4.9	5.2
Have you been diagnosed as having chronic bronchitis by a physician?	7.4	4.8	5.5	5.5	2.3	2.4	4.7	4.0
Treatment with anti-asthmatic drugs	6.1	6.0	4.2	6.6	3.3	5.0	4.3	5.8

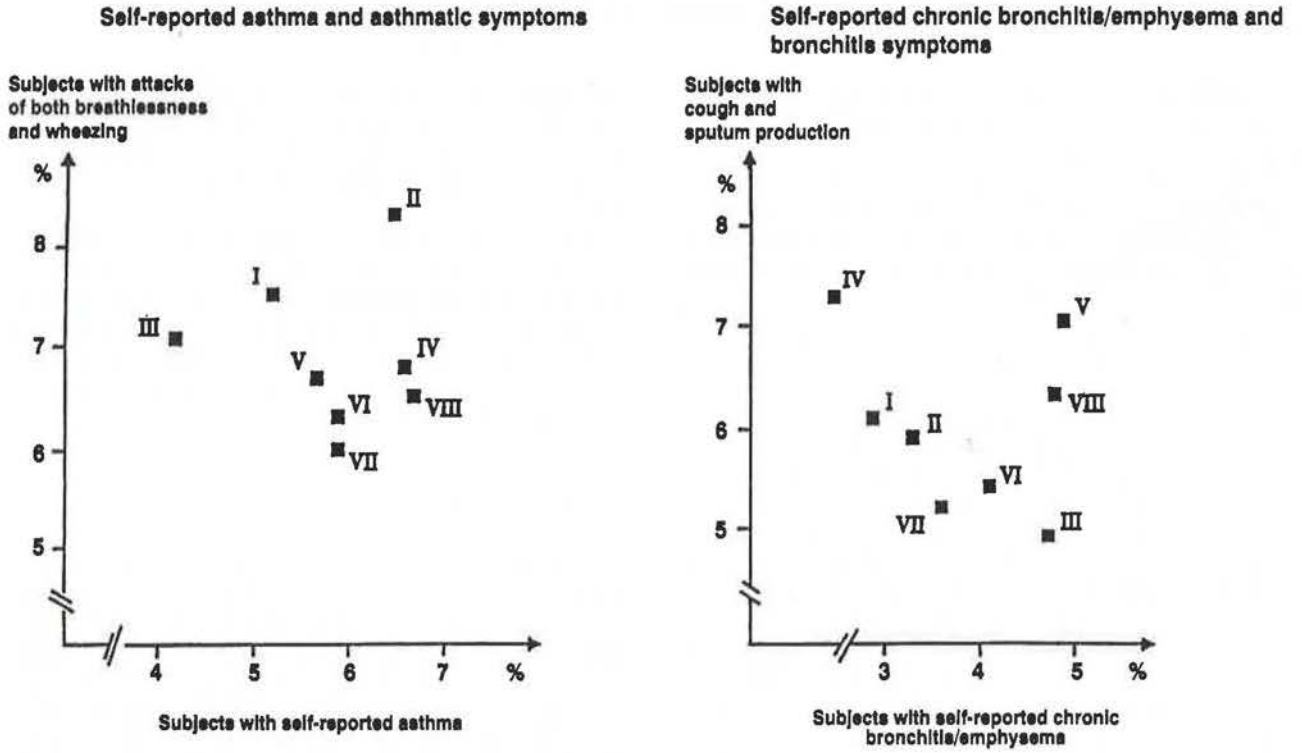

Fig. 2. – Self-reported asthma and chronic bronchitis/emphysema *versus* asthmatic and bronchitis symptoms, respectively, in percentages in the eight study areas.

Table 6. – Relationships between symptoms or self-reported diseases and demographic variables including smoking habits

Symptom/ disease	Specific exposure	Prevalence %	Smoking	Population density	Coastal/ inland	Age	Sex	Constant
Wheezing and attacks of dyspnoea	-	6.7	0.24***	-0.04	-0.06	0.20**	-0.05	-3.34
Self-reported asthma	-	5.9	0.01	0.10	-0.55	0.17*	0.09	-3.59
Cough and sputum production	-	6.8	0.37***	-0.10	0.01	0.28***	0.21	-3.74
Self-reported chronic bronchitis	-	4.0	0.31***	0.24*	0.04	0.52***	-0.07	-5.39
Wheezing or attacks of dyspnoea or severe cough when exposed to:	Exercise in cold weather	21.0	0.26***	-0.04	-0.12	0.31***	0.13	-2.31
	Dust and smoke	22.0	-0.11**	-0.02	-0.05	0.15***	-0.05	-1.25
	Car-exhaust fumes and air pollution	16.0	0.10*	0.00	0.01	0.33***	0.09	-2.54
	Perfumes and scents	17.0	0.05	0.06	-0.06	0.23***	0.52***	-2.53

The table gives the estimated β-coefficients of the logistic model and test results. *: $p<0.05$; ***: $p<0.001$, two-sided test. A large (positive) value of β means that the probability of the symptom increases when the value of the corresponding variable increases, and $\beta = 0$ means that the corresponding variable does not affect the risk of the symptom at all. A negative value means a decreasing risk. If β differs significantly from zero it is indicated by asterisks in the table. For example a smoking woman born 1919–1920, and living in a town in the coastal area has the value -0.71 of S for respiratory symptoms during exercise in cold weather. The probability for her is 0.33, and a nonsmoking woman with the same characteristics has a probability of 0.23.

The prevalences of the various symptoms among the 230 subjects who reported that they at some time had chronic bronchitis were: cough in 45%, sputum production in 68%, cough and sputum production combined in 37%, wheezing in 53% and attacks of breathlessness in 50%. Attacks of breathlessness, wheezing, or severe cough were reported to occur after exercise in cold weather by 67% of the 230 subjects, after exposure to dust and smoke by 64%, after exposure to car-exhaust fumes and air pollution by 52%, and after exposure to scents or perfumes by 47%.

Only 22% of those who reported that they had both cough and sputum production stated that they had at some time had chronic bronchitis or emphysema. Discrepancies and local variations exist in the prevalence of self-reported chronic bronchitis or emphysema and productive cough (fig. 2). There was a strong association between smoking and reports of chronic bronchitis ($p<0.0001$). Only 36% of women in the oldest age cohort who reported that they had at some time had chronic bronchitis were smokers or ex-smokers.

Multivariate relationships

The probability of a symptom or a disease was estimated as a function of smoking habits, population density, region (inland/coastal), age and sex by logistic models. The expectations of the presence of various symptoms, including self-reported asthma, wheezing and attacks of breathlessness, self-reported chronic bronchitis and longstanding cough and sputum production were estimated as functions of the demographic variables. Apart from smoking and age, as the bivariate analysis also demonstrated, we found only one correlation ($p<0.05$) between higher population density and self-reported chronic bronchitis (table 6).

As no obvious differences between the various types of settlement and between inland/coastal regions as causes of symptoms/disease were found, we examined the relationship between attacks of breathlessness or wheezing or severe cough on the one hand and various exposures on the other hand. These exposures should be regarded to be factors provoking respiratory

symptoms. We did not find any correlation, other than that seen for age or smoking and the appearance of symptoms, with one exception; women reported more symptoms provoked by perfumes (table 6).

Discussion

The high response rate in our study is comparable to that in other Scandinavian studies [16, 23]. There was little difference in response rate in men and women, in the different age cohorts, or in the different areas of domicile. The lowest response rate was from the area with many Finnish-speaking inhabitants. The differences were, however, small and did not affect the results. The proportion of smokers in the study population did not differ from that previously reported from Sweden [24], although it was lower than in Denmark, Norway and a number of other European countries, especially in men [25, 26], despite the fact that our definition of smokers, *i.e.* all those who have smoked regularly in the last 12 mths, is somewhat wider than that used by the MRC [21].

The large proportion of subjects who reported respiratory symptoms (41% in both sexes) were similar to that reported in a Norwegian survey, which also quoted similar prevalences of the various respiratory symptoms to those that we found [23]. The increase in respiratory symptoms with age was expected. Large differences in the smoking-related prevalence of respiratory symptoms in men and women have been reported [27, 28]. We found no such differences in respiratory symptoms between men and women despite differences in the proportions of smokers. Early epidemiological studies have described the respiratory symptoms, including wheezing in smokers [27, 29].

There was no difference in the occurrence of respiratory symptoms in urban and rural areas despite the greater proportion of smokers in the towns. We did not find more symptoms in the more polluted urban coastal areas than in the rural interior. While there are differences due to age and smoking habits, no obvious differences were found between the inland and the more heavily polluted coastal areas and between the different type of settlements. One factor which may contribute to the production of symptoms in subjects in inland and sparcely-populated areas is the air-inversion that occurs in winter and causes very high levels of airborne soot and dust in small towns and villages, where houses are commonly heated by wood furnaces [30]. High ozone levels have also been measured during changes in temperature and weather in the interior of northern Sweden [31], where the winters are longer, drier and colder than on the coast.

A surprisingly large proportion of subjects (6%) by Scandinavian standards [10, 17, 18, 28, 32] stated that they had a some time had asthma, so called cumulative prevalence [10, 33]. The use of different methods and diagnostic criteria makes the comparison of different prevalence studies difficult. The highest cumulative prevalence reported from Scandinavia is 5.2% from Denmark [10]. Recent studies from southern Europe suggest a similar cumulative prevalence of asthma; 4.1% in Marseilles [34], and 5% in North Italy [35]. A lower prevalence has been reported from central Finland (1.8) [36] and Prague (2.2%) [37] but these studies do not report cumulative prevalences. Prevalence studies in the USA [38] have indicated a similar asthma prevalence to that in Europe. Even when expressed as the prevalence of current asthma, the prevalence is reported to be higher in Australia [39] and New Zealand [4]. Authors emphasize the value of including a question of self-reported asthma in epidemiological studies [35, 36]. This facilitates the comparison of the results of different studies.

Small studies in northern Sweden [40] have shown a prevalence of self-reported asthma of 5% (N. Stjernberg, personal communication, 1989), whilst studies in the south of Sweden have reported a prevalence of 2–3% (B. Forsberg, personal communication, 1989). While the high report-rate of asthma in our study does not provide a true prevalence figure, it would tend to support the higher prevalence of asthma in north Sweden compared to the south.

As has been discussed by others [33], we found discrepancies between the reported prevalence of asthma and the reported presence of asthmatic symptoms. The importance of performing clinical examinations in epidemiological studies of asthma prevalence has also been emphasized [41]. We cannot estimate the true prevalence of asthma in Norrbotten from the results of this questionnaire. However, the fact that less than half of the subjects who reported attacks of both breathlessness and wheezing, also claimed that they had at any time had asthma suggests that there may be many people with undiagnosed asthma.

Sweden has a lower prevalence of chronic bronchitis than Finland [27] and a lower mortality from chronic bronchitis than most other European countries [42]. The 4% of subjects who reported that they had chronic bronchitis is of the same order of magnitude as reported in other Scandinavian studies [17–20, 32]. However, as only 22% of the subjects who reported both cough and sputum production stated that they had at any time had chronic bronchitis or emphysema, there may be a considerable number of people with undiagnosed chronic bronchitis in Norrbotten. Asthmatic symptoms and the use of anti-asthmatic drugs were, as expected, reported less frequently in subjects with chronic bronchitis. However, attacks of breathlessness, wheezing or severe cough on exposure to irritants such as tobacco smoke, dust or car-exhaust fumes were as common among those who reported chronic bronchitis as among those who stated they had asthma.

As expected, a larger proportion of those reporting symptoms of chronic bronchitis were smokers or ex-smokers. However, only a minority of women (36%) in the oldest age cohort who stated that they had at any time had chronic bronchitis were smokers or ex-smokers. We had also expected more marked differences in the prevalences of respiratory symptoms between men and women, especially among the oldest cohort in which

there was a greater difference in the proportion of men and women who smoked. The high prevalence of cough and sputum production in the oldest cohort of non-smoking women can, in part, be explained by the reduction in mucus clearance that occurs with age [43] and women may be more aware of their symptoms than men [44]. A larger proportion of the youngest age cohort of women were smokers and this may explain the prevalence of chronic bronchitis reported by this group.

Our survey shows that respiratory symptoms are common in northern Sweden. Suprisingly, we could not demonstrate any significant differences in the occurrence of specific symptoms between rural and urban areas or between the industrialized coastal area and the interior. The prevalence of symptoms associated with asthma and chronic bronchitis suggests that there are considerable numbers of people with undiagnosed chronic bronchitis as well as asthma in the province. The discrepancies between the reported diagnoses of asthma and chronic bronchitis and the presence of typical symptoms of these diseases makes the interpretation of the results difficult.

The frequency of respiratory symptoms, and the suggestion that there may be many undiagnosed cases of asthma and chronic bronchitis, motivate further studies including clinical examination of subjects reporting respiratory symptoms.

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Maladie pulmonaire obstructive dans le nord de la Suède. Appréciation des symptômes respiratoires dans une enquête postale. B. Lundbäck, L. Nyström, L. Rosenhall, N. Stjernberg.

RÉSUMÉ: La prévalence des symptômes respiratoires chez 6.610 adultes (3.372 hommes et 3.238 femmes), vivant dans des zones choisier de Norrbotten, au nord de la Suède, a été appréciée dans une enquête postale. Les taux de réponse furent identiques chez les hommes et les femmes, et au moins un symptôme respiratoire a été signalé chez 41% des sujets de chaque sexe: expectorations chez 22%, sifflements chez 14%. Malgré des différences dans les habitudes tabigues et dans les symptômes n'est par différente selon le sexe ou selon les zones urbaines fréquents chez les personnes vivant dans un intérieur rural que dans la zone côtière industrialisée. Des antécédents d'asthme, actuel ou passé, ont été signalés chez 323 sujets (5.9%), tandis que 234 sujets (4.1%) affirmaient souffrir de bronchite chronique ou d'emphysème. Moins de la motité des sujets signalant des crises de dyspnée avec sifflements, signalait avoir souffert d'asthme à un moment quelconque. Quoique la prévalence exacte de l'asthme et de la bronchite chronique ne puisse pas être appréciée dans cette enquête postale, ses résultats indiquent que la prévalence pourrait être plus élevée dans le nord de la Suède que celle signalée dans le sud de ce pays.
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