Major public health problems – allergic disorders

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Chapter 5.8: Major public health problems – allergic disorders

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- Allergies and other hypersensitivity have increased strongly in the whole western world during the past few decades.
- In Europe the risk of asthma and hay fever is greatest in the British Isles and lowest in south-eastern Europe. Scandinavia has a middle position between these two extremes.
- The prevalence of allergic disorders varies geographically. Asthma and hay fever are, with some exceptions, most common in northern Sweden, where the rate of increase has also been highest.
- Mortality from allergic disorders has declined during the past few decades thanks to improved medical treatment.
- The number of serious allergic reactions (anaphylactic shock) leading to hospitalization increased threefold between 1987 and 2002.
- Allergic disorders are the most common long-term health problems among children. In The Children's Environmental Health Survey 2003, 26% of parents of 4-year-old children and 28% of parents of 12-year-old children stated that their children had some kind of allergy disease.
- During childhood, asthma and allergy (termed atopic disorders) are more common among boys. In the 'teens and among adults these disorders are more common among women. This is true for asthma, hay fever, atopic eczema and eczema and nickel allergy.
- It has been hypothesized that an increasingly sterile indoor environment is involved in the increase of allergic disorders in the western world.

Allergic disorders and complaints are common

What are allergies?

Allergic disorders are characterized by various symptoms from the air passages, the gastrointestinal tract or the skin on contact with substances that people generally tolerate without real discomfort. Sometimes the term atopic disorders is used instead: this covers a more specific tendency to form IgE antibodies after contact with certain substances, allergens.

Allergic disorders occur partly as atopic diseases in connection with reactions to specific allergens, and partly as non-atopic disorders linked with chronic inflammation states and hypersensitivity reactions to things that irritate all human skin and mucus membranes, for example, tobacco smoke, detergents and various infectious agents.

The organ systems involved, and what allergens people with atopic diseases react to tend to, change with age. Atopic eczema is often the earliest sign; not infrequently it is seen during infancy. Asthma in connection with infections often makes its debut before two years, while hay fever afflicts predominantly school children and adults. Foodstuffs are common allergens in infants, while allergies to furred animals often start in pre-school children and pollen allergies in schoolchildren and adults. Eczema and asthma often improve during the later school years but can recur later in life.

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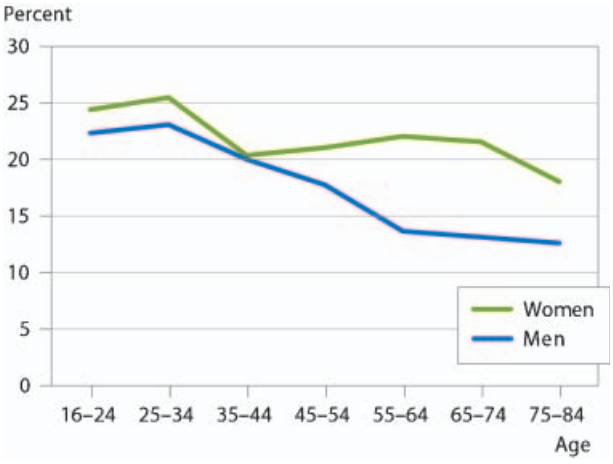

Figure 5:60. Proportions of men and women by age group who report that they suffer from one or more allergic disorders, average for the years 1999–2001.
Source: Survey of Living Conditions, Statistics Sweden.

Allergic disorders are very prevalent in the Swedish population. In the Statistics Sweden Surveys of Living Conditions based on the years 1999–2001, 20% of the population aged 16–84 years stated that they suffered from some allergic disorder (Figure 5:60). The majority (17%), however, judged their disease as 'mild'.

Interview studies with more precise questions indicate that the true prevalence of allergic disorders is even higher. In the Children's Environmental Health Survey 2003[1], symptoms of allergic disorders were sought among children of 4 and 12 years, respectively. For 26 and 28%, respectively, of the children at these ages, the parents stated that their children had some form of current allergic disorder (Figure 5:61).

In the whole western world the number of people reporting that they suffer from allergic disorders has increased during the past few decades. In Sweden, for example, the proportion of men reporting for military call-up who have the diagnoses asthma, hay fever and/or eczema when they report increased threefold between 1970 and 1999 (Figure 5:62).

In parallel with this increase the possibilities of treating allergic disorders have improved appreciably. The development of steroid preparations for inhalation in the treatment of asthma, for example, and the development of effective anti-histamine preparations for the treatment of hay fever have been particularly important. Sales of inhalation preparations measured in *defined daily doses* (DDD) per 1,000 inhabitants are shown in Figure 5:63. The improvement in treatment methods has meant that the increased dispersion of these disorders throughout the population has gone in step with a reduction in the proportion of people suffering from very severe symptoms of allergic disorders.

The death rate from asthma[2] has declined successively since the early 1980s (Figure 5:64). The number of hospital admissions has also declined (Figure 5:65). One exception, however is hospitalization for serious general allergic reactions, termed anaphylactic shock, where children and young people aged 0–19 years cared for in hospital increased by threefold between 1987 and 2002 (Figure 5:66).

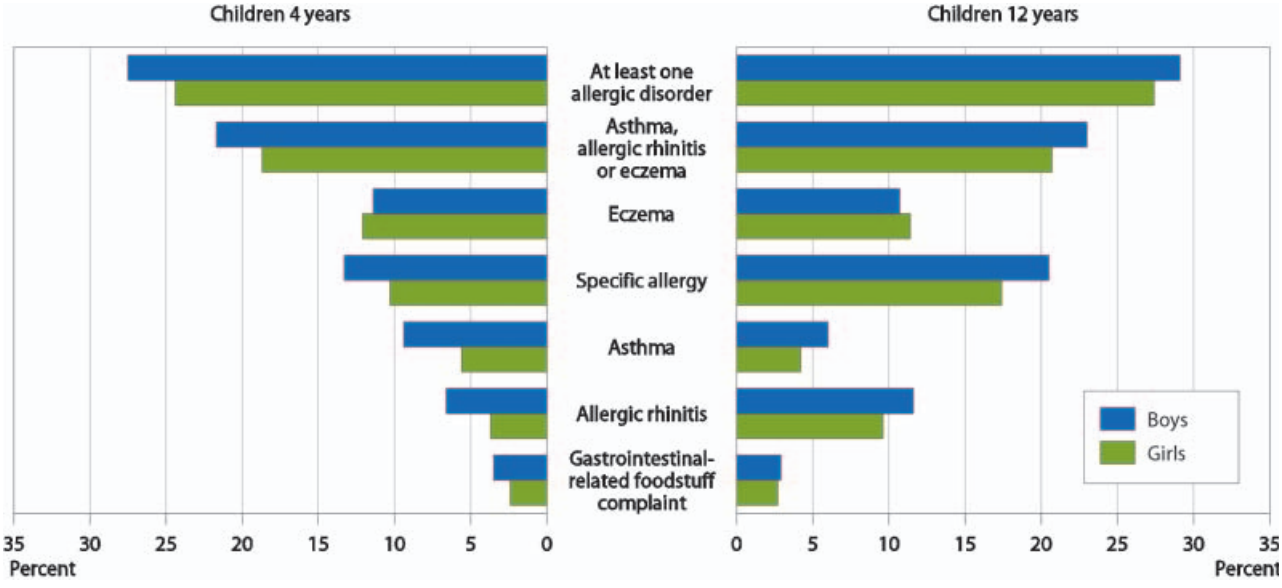

Figure 5:61. Proportion of self-reported allergic disorders among boys and girls aged 4 and 12 years, respectively, according to Children's Environmental Health Survey 2003.
Source: Miljöhälsorapport 2005, National Board of Health and Welfare.

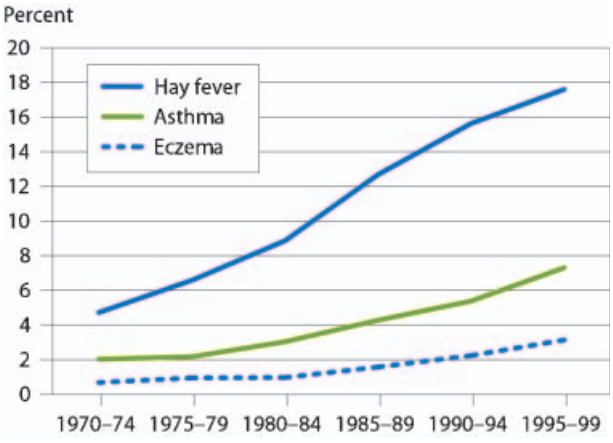

Figure 5:62. Proportion with allergic disorders in the form of hay fever, asthma or eczema among 18-year-old men, by year of reporting for military call-up, based on five-year periods from 1970 to 1999.
Source: Swedish Military Service Conscription Register, National Service Administration.

During the period 1992–2001, eight people in Sweden died of such reactions triggered by foodstuffs or wasp stings, of whom five were aged 0–17 years.

Eczema – an occupational disease

In the Statistics Sweden Survey of Living Conditions 1996–97,[3] 15% of men and 19% of women aged 16–84 years stated that they had eczema or skin rash, of whom about 2% specified severe symptoms. Among children up to 15 years, according to the parents, 9% had eczema or skin rash. An in-depth description of the problems associated with eczema and skin rash was given in Health in Sweden – the National Public Health Report 2001.

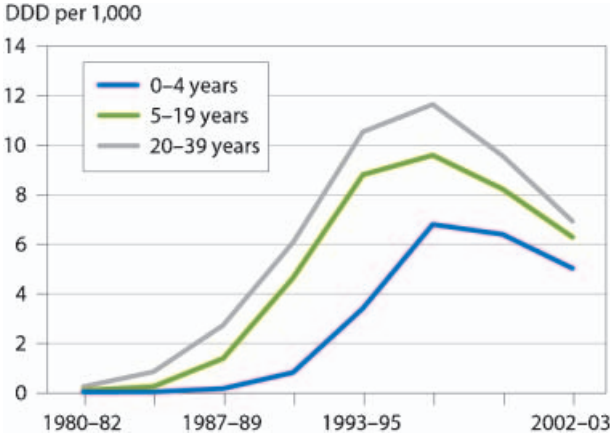

Figure 5:63. Prescribed inhalation steroids dispensed by chemists, defined daily doses (DDD) per 1,000 and day for the years 1980–2003, for age groups 0–4 years, 5–19 years and 20–39 years.
Source: Apoteket AB (National Cooperation of Swedish Pharmacies).

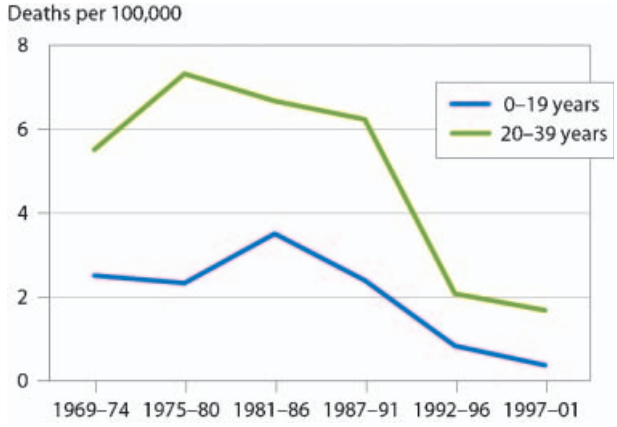

Figure 5:64. Number of deaths per 100,000 in age groups 0–19 years and 20–39 years, with asthma as underlying cause of death, five-year periods, 1969–2001.
Source: Cause of Death Register, Centre for Epidemiology, National Board of Health and Welfare.

People in occupations where the hands have much contact with water, soap, cleansing agents and allergy-inducing chemicals are more exposed than others to the risk of developing allergic complaints. Contact eczema of the hands is responsible for about 90% of all occupational skin diseases involving chemicals. The occupations involved are largely women-dominated, with a large element of 'wet work' and much contact with water [1].

Geographical and social differences

The existence of allergic disorders was originally described among economically privileged people in England during the nineteenth century. Certain allergic problems are still more prevalent among

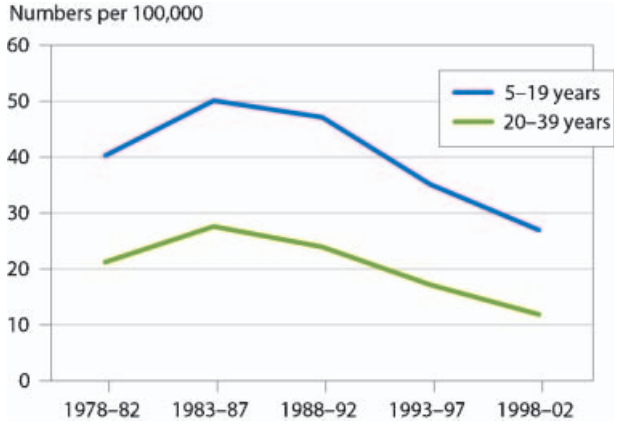

Figure 5:65. Numbers per 100,000 aged 5–19 years and 20–39 years hospitalized in Stockholm county with asthma as main diagnosis, five-year periods 1978–2002.
Source: Hospital Discharge Register, Centre for Epidemiology, National Board of Health and Welfare.

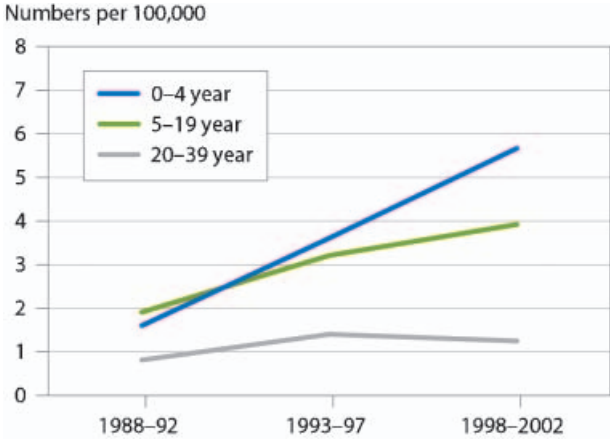

Figure 5:66. Numbers per 100,000 aged 0–4 years, 5–19 years and 20–39 years hospitalized for anaphylactic shock, three five-year periods 1979–2003.
Source: Hospital Discharge Register, Centre for Epidemiology, National Board of Health and Welfare.

higher social groups than at other levels of society. Hay fever, for example, is more common among upper white-collar workers than among unskilled blue-collar workers in Sweden, while asthma is more common among the latter. Both asthma and hay fever have increased more rapidly among unskilled blue-collar workers during the past few decades (Figure 5:67).

Studies have also shown that asthma disease more frequently causes severe symptoms and hospitalization among children in exposed social circumstances than among other children [2].

In several major international collaborative studies, the prevalence of asthma diseases in children – the International Study of Asthma and Allergies in Childhood (ISAAC) – and in adults – the European Community Respiratory Health Survey (ECRHS) – has been studied in different parts of Europe [3]. These studies describe a clear pattern in which the risk of asthma and hay fever is high in North-western Europe and low in Southern and Eastern Europe. The risk is highest in Great Britain and Ireland and lowest in Greece and Albania. Sweden has a middle position, with a clearly higher risk than Eastern and Southern Europe, but a considerably lower one than the British Isles.

In Sweden, too, there are regional differences. The risk of asthma is highest in northern Sweden and fairly high in a central belt and in southern Småland and south- western Skåne (Figure 5:68). Hay fever is also common in northern Sweden but even more so in a central belt (Värmland, Dalarna and Närke), while Gotland and parts of Småland and Skåne have the lowest rates of hay fever.

The pattern has remained relatively similar for several decades but has been accentuated in recent years when the rate of increase has been higher in northern Sweden (Figure 5:69). The Children's Environmental Health Survey 2003[1] also shows a north-south gradient among children. Some 7% of the 12-year-old children in northern Sweden had asthma, compared with about 5% in the rest of the country. In Norrbotten and Västerbotten the prevalence was the highest in the country for this age group – about 10%. For allergic rhinitis, on the other hand, there were no clear regional differences among 12-year-olds; and this was also true of eczema or pollen-related complaints [4]. There were also considerable differences between groups of differing ethnic origins and different life styles in

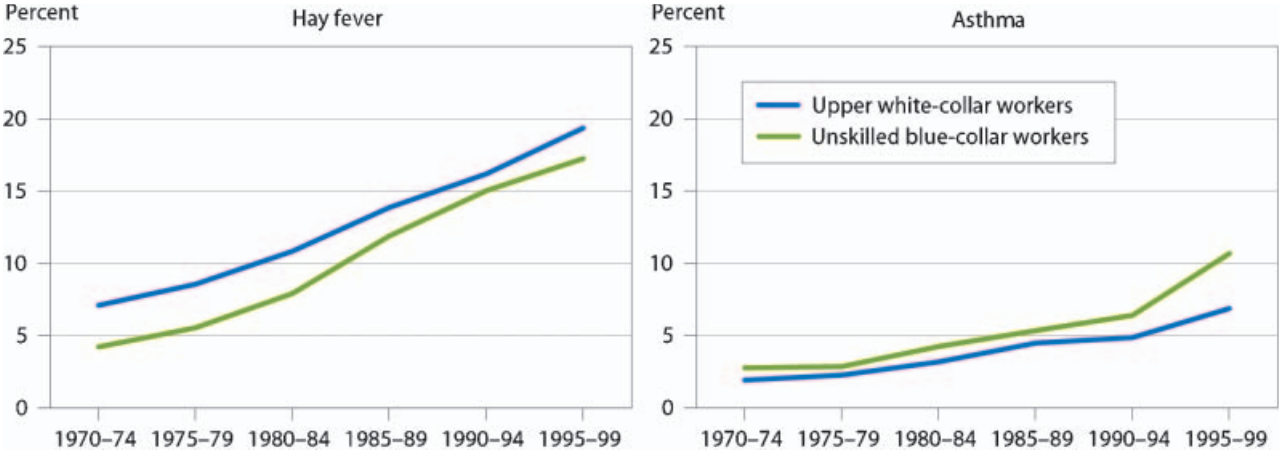

Figure 5:67. Proportion of 18-year-old conscripts with hay fever (left) and asthma (right) by socioeconomic group, based on five-year periods 1970–99.
Source: Swedish Military Service Conscription Register, National Service Administration.

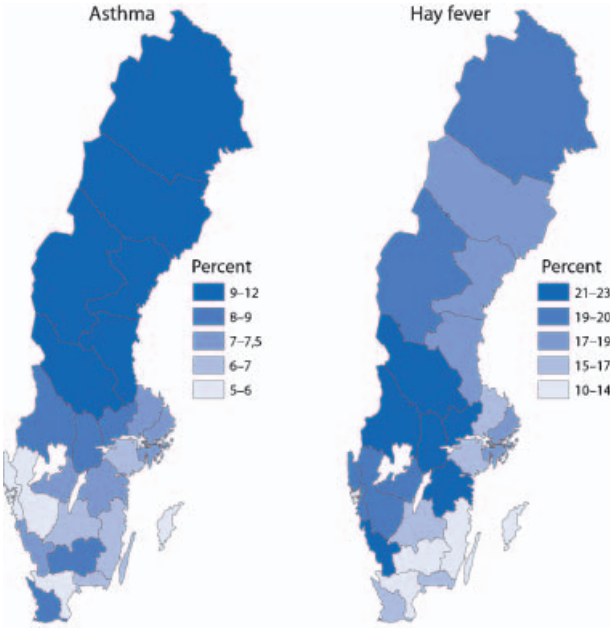

Figure 5:68. Prevalence of asthma and hay fever (%) among males eligible for conscript in different counties in Sweden, five-year period 1995–99.
Source: Swedish Military Service Conscription Register, National Service Administration.

Sweden. Children growing up in anthroposophical homes, for example, ran only half the risk of developing an atopic disorder [4]. The same was true for children and adults of Turkish origin. Children and adults with Chilean origin, on the other hand, run a twofold risk of being afflicted by atopic asthma, and also a clearly increased risk of hay fever and atopic eczema [2].

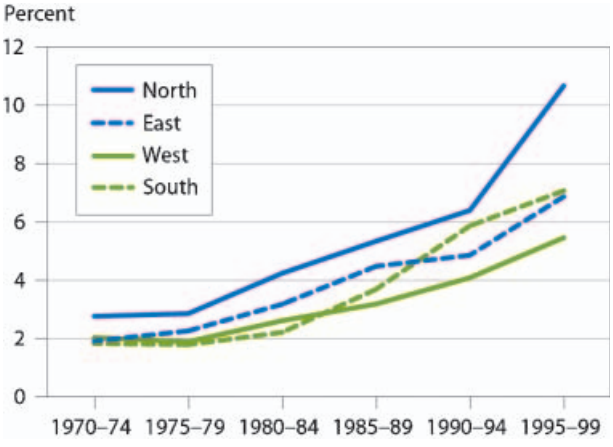

Figure 5:69. Proportion of 18-year-olds reporting for national military service with asthma, by region in Sweden, based on 5-year periods 1970–1974 to 1995–1999.
Source: Swedish Military Service Conscription Register, National Service Administration.

The reason for the increase in atopic disorders is yet to be determined

Some of the reported increase in allergic disorders can probably be explained by increased awareness and knowledge of these diseases in the general population and in the health services. Previously, many people may well have been troubled by itchy eyes and sneezes during the spring without reflecting over the fact that it could be a pollen allergy; or wheezes in connection with colds without themselves, or even the doctor, calling them asthma [5].

Patient and causes-of-death statistics, however, show a clear increase in asthma-related morbidity and mortality during the 1970s and the first half of the 1980s (Figures 5:63 and 5:64). This was before effective preventive treatment was introduced. The number of hospitalizations of infants with asthma-like complaints also continued to increase during the 1990s [6]. This supports the conclusion that asthma have also objectively become more common among young Swedes during the past 30 years.

Recent studies from, e.g., Great Britain and Italy indicate that the increase in asthma and allergy may now in fact have peaked in parts of Western Europe [7]. As yet no Swedish studies indicate that this is the case in Sweden also.

Atopic disorders arise in an interplay between the body's immune system and various environmental agents. It has long been known that there are hereditary components in the immune system that make certain families more susceptible than others to Allergic disorders. Molecular-biological research suggests that there are many different components in this system that are hereditary and that influence the risk of allergic disorders [8].

The increase in allergic disorders during the past few years suggests that much of the Swedish population has a hereditary predisposition to developing atopic diseases. Heredity probably influences the severity of an allergic disorder more than its occurrence.

In recent years many of the environmental factors previously indicated as risk and protective factors for atopic diseases have been re-evaluated [9]. This applies to passive smoking, breast-feeding and early contact with furred animals. Passive smoking (particularly during the life of the foetus) increases the risk of infection-related infant asthma, but appears not to have any great significance for the development of allergy [10,11]. Breast-feeding reduces the risk of infection-related infant asthma, but the protective effect against atopic diseases is a subject of disagreement, except for families with strong heredity for atopy [12,13].

Furred-animal allergens are common. Children susceptible to furred-animal allergy therefore develop their allergy irrespective of whether they have animals in the home. It has also been discussed whether ownership of animals in some cases could even contribute to tolerance, protecting against the development of allergies; but opinions differ on this point [14–16]. Many experts now consider that these factors affect chiefly the severity of their disease among people with allergic disorders but that they play no significant part in the development of the disease. Preventive efforts against these factors therefore seek primarily to improve the situation for children and adults who have allergic disorders; but they cannot be expected to reduce the occurrence of these disorders to any major extent.

Studies in Central Europe have reported that children who grow up in agricultural families with much contact with bacteria from farm animals run smaller risks of developing atopic diseases than others do [8]. Investigations of conscripts and school children in Sweden have confirmed that this appears to apply in Sweden too, and that this protective effect has probably increased in recent years [17,18]. Studies have also shown that the risk of developing atopic diseases is higher in a sibling group [19] and lower among children who start at an early age in day-care centres [20,21].

One hypothesis that can explain these phenomena, and that has many advocates among leading allergy experts today, is that an increasingly sterile indoor environment has affected people's bacteria flora so that the white blood cells in the immune system are stimulated in a way that increases the risk of developing allergies [22–24]. If this hypothesis can be confirmed it opens new opportunities for preventive efforts through directed stimulation of the immune system. Experimental trials with promising results have been reported, in which infants have been given innocuous lactic acid bacteria [25]. It is still too early, however, to draw any definitive conclusions from these experiments.

Acknowledgement

The author likes to thank Lennart Bråbäck.

Notes

1 See also National 'Board of Health and Welfare Miljöhälsorapport 2005 (Environmental Health Report 2005) and Chapter 11 of the present public health report.

2 This section does not treat chronic obstructive lung disease (COLD), a serious disease the symptoms of which resemble asthma. COLD affects primarily older smokers and is dealt with in the section on tobacco habits in Chapter 9.

3 Questions on eczema and skin rash appear in the Survey of Living Conditions only once every eight years. The next time these questions will be included is the survey year 2004–05.

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