Chronic Airways Disease in the United Kingdom

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Respiratory diseases place heavy demands on health service resources throughout the United Kingdom (UK) and other European countries. They also have severe economic consequences, since sufferers tend to be incapacitated for a number of years of their earning life. They account for one-fifth of all deaths and one quarter of all consultations with general practitioners and absence from work because of sickness in England and Wales. Sufferers from respiratory disease are 4 times more likely to be men than women and, for most chronic respiratory diseases, are likely to be smokers.

However, with few exceptions, the burden of respiratory disease is diminishing gradually. The past 15 years have witnessed a steady decline in respiratory tuberculosis, diminishing mortality from influenza and other acute respiratory infections (excluding pneumonia), and, more recently, abatement in the incidence of lung cancer. However, there are still areas where future research will be useful, e.g., in asthma, where increases in asthma mortality are a notable exception to the general trends in the incidence of other respiratory diseases.

TRENDS IN RESPIRATORY DISEASE

Consideration of trends in respiratory diseases has largely been restricted to Great Britain due to the ready availability of data. Britain is not atypical of other European countries, although comparisons among countries must be treated with care since large variations in certification can sometimes occur for some individual diagnostic groups. For the purposes of this article I am defining chronic airways disease (CAD) using mortality statistics from the International Classification of Diseases (ICD, 9th revision) chronic bronchitis, emphysema, and asthma (categories 490-493). Morbidity data can be misleading, since they reflect service use, which is not necessarily an accurate measure of prevalence or incidence. They are also dependent on medical records that are not subject to centralized coding. The limitations of mortality data must also be recognized. Mortality data are dependent on the completion of death certificates and coding rules and practice. Both of these may change over time and vary between areas. In the figures presented the changes described are, however, consistent between age-sex groups, and the differences shown are too large (and consistent) to be explained by changes in practice alone.

The high prevalence of chronic bronchitis in the UK has led to it being termed “the English disease”; however, the overall incidence of chronic bronchitis, emphysema, and asthma has more than halved in both men and women since 1969. The decline has occurred across all age groups in England and Wales, in both mortality and morbidity (Fig 1). A similar decline has also occurred in other parts of Europe (Fig 2). Asthma itself is only a small part of this category, but disaggregation of the mortality data for asthma alone shows increasing secular trends in England and Wales. This represents a notable exception to the general trends in the incidence of other respiratory diseases. Trends over time in the mortality rates from any disease must always be treated with a certain degree of caution, since they will always be sensitive to changes in diagnosis, coding, or certification, but Burney suggested that the rise in deaths from asthma cannot be accounted for in this way.

RISK FACTORS FOR RESPIRATORY DISEASE

The chronic respiratory diseases, most notably chronic bronchitis and emphysema, are only amenable to palliative treatment, and depend for their restriction on primary prevention. A number of important risk factors have been
identified, and it has been suggested that the most appropriate way to minimize the prevalence of CAD is to avoid those environmental conditions which lead to ciliary inhibition. The most common (and those which offer opportunities for preventive intervention) are cigarette smoking, atmospheric pollution, and occupational exposure.

Cigarette smoking

The trends in smoking prevalence over the past two decades have been encouraging in that the prevalences of regular smoking among adults and adolescents have been declining steadily in the UK and Europe since 1970. Between 1971 and 1985 the proportion of men in the 20-29 age group smoking manufactured cigarettes fell from 64% to 52%. The decline from 1970 to 1984 was from 52% to 36% in males and from 41% to 32% in females in the UK. Only recently, however, has there been any evidence of a similar decline in children’s smoking.

The proportion of adult men smoking tobacco fell for all age groups between 1971 and 1985. Although there was a fall in the proportion of smokers among adult women in all age groups except the over-60s, between 1982 and 1984 there was a worrying increase in the proportion of young women smoking; 5% more women aged 25-34 were smoking in 1985 compared with those in 1982 (Fig 3).

The decrease in smoking prevalence has been greatest in the professional class and lowest in the semi-skilled and unskilled manual labor groups. Between 1972 and 1984 the percentage fall in the proportion of professional men smoking (49%) was double that among male unskilled manual workers; for women the difference is almost four-fold in favor of professional women.

Similarly, there has been a decline in cigarette consumption; annual consumption per adult man peaked in 1973 and had fallen by 35% by 1982. The decrease in consumption for women was only 22% for the same period—however, levels of consumption among women are generally lower than in men. A factor that should also be mentioned is that cigarettes contain less tobacco today than in the 1960s and early 1970s (0.75 g vs 1 g).

There has been a great deal of research aimed at identifying factors associated with the uptake of smoking, which occurs largely during the school years. The factors most frequently identified as having significant effects are: parental and sibling smoking, susceptibility to peer pressure, being dismissive of the short-term health hazards, and being a low achiever at school. These have been used to derive health promotion strategies that have produced some encouraging results, although the extent of their effect on the general decline is difficult to estimate. More work is necessary to establish why the habit so often persists into adulthood.

The lack of success of these programs to affect the behavior of young girls has been suggested as one explanation for the worrying trend of smoking in women. An additional problem is the introduction of more and more low-tar cigarettes, which are targeted at women smokers. This is linked to an important influence on the behavior of the tobacco industry in recent years, which has resulted from increased pressure on the industry to modify products in an attempt to protect smokers against the health risks associated with the habit. Sales-weighted tar and nicotine levels have fallen by 50% and 25%, respectively, over the past 15 years in the UK (Fig 4). The introduction of filters and ventilated filters has altered tar consumption. Also, the introduction of a supplementary tax in the UK in 1975 on cigarettes with a tar yield of more than 20 mg/cig may have affected the availability of these higher-tar cigarettes. Pressure is now being placed on tobacco manufacturers to reduce tar levels further with maximum tar levels for new brands being recommended.

The evidence linking cigarette smoking to chronic respiratory disease is so strong that the primary objective of all prevention and control programs should be to reduce the number of people smoking and to find out what drives individuals to start smoking. New initiatives are required if we are to understand the psychology of smoking, especially among the vulnerable groups—the young (especially women) and lower socioeconomic classes.

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![Figure 3](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21601/ on 06/27/2017)

![Figure 4](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21601/ on 06/27/2017)

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While people continue to smoke, we can try to persuade them to modify their habit to make it less harmful. One suggestion is to reduce the tar and nicotine levels of the cigarettes being smoked; however, it is not yet clear whether people simply compensate for the corresponding reduction in their nicotine intake by changing their smoking habits. Work is being carried out to address this problem. It has been suggested that by reducing the tar yield but maintaining the nicotine yield of cigarettes, the problem of compensation will be avoided. It is not yet clear whether this is the case, and it brings about further discussion as to whether nicotine is itself toxic.

**Passive Smoking**

Concern is increasing regarding the effects of environmental tobacco smoke or passive smoking—the involuntary inhalation of secondhand smoke. A recent report in the UK has suggested a relative risk of lung cancer in nonsmoking individuals with smoking spouses of 1.3. Given the problems of identifying those who are never exposed to environmental tobacco smoke, it has been suggested that the true risk could be as great as 1.5.

Also of concern is the possibility of passive smoking as a risk factor which predisposes young people to develop chronic respiratory disease in later life. The prevalence of acute bronchitis and pneumonia is directly related to parental smoking. The risk is believed to be greatest in young babies.

**Pollution**

Dramatic reductions have been achieved in the levels of outdoor air pollution—nearly a 90% fall in ambient smoke and a 40% fall in ambient sulfur dioxide since the early 1960s (Fig 5). Waller, in his contribution to these proceedings, discusses this and the impact of the Clean Air Act (1956) in the UK more fully. Acute episodes of pollution are no longer experienced, and perhaps an increasingly important factor in the pathogenesis of chronic bronchitis and emphysema is indoor pollution, which is increasing. There is a great deal of emphasis in current building practices on energy conservation, and ventilation has been minimized.

The effects of indoor pollution is thought to be small relative to those of outdoor pollution. But there is public interest in the types and extent of the effects. Believed to be of importance are methods of cooking and unflued heating; in addition, cigarette smoke is also thought to contribute to indoor pollution. The occupants of some modern buildings have reported an association between their work environment and a collection of symptoms including those of upper respiratory tract involvement, sometimes termed “sick building syndrome.” Many causes have been suggested: formaldehyde insulation, office furniture, carpet adhesive, excess CO₂, and poor air circulation. But little understanding has come from the investigation of individual “sick” buildings.

**Occupational Risks**

Certain occupations are well known as hazardous to respiratory health, but their prominence is declining with a further shift in the make-up of the workforce in the UK away from heavy manufacturing industries (Fig 6), such as mining, metal production, and textiles. Occupational exposures have been reduced by imposed control of dust and fumes and more efficient personal protection. During the same period in the UK there has been a surge in the level of the unemployed, and this itself may be a risk factor for disease through poverty. Also, the effects of newer industries on respiratory disease have yet to be evaluated. The continuous advances in technology will inevitably introduce new health hazards into the workplace, for example, occupational asthma, and regular surveillance will be required to monitor and control these effects.

**Management of Chronic Airways Disease**

It is of concern that the number of young children requiring hospitalization for acute respiratory infections (ARI) is growing. This could reflect a cautious admissions policy, but it has also been suggested that there is a general link between a history of ARI in childhood and the development of chronic respiratory disease in later life. Barker and Osmond have established a strong geographic relationship between the mortality rate for chronic bronchitis and the infant mortality rate for chronic bronchitis and the infant mortality rate for bronchitis and pneumonia 40 years earlier.
Indeed, regression analyses suggest that there is a stronger association between childhood respiratory infection than between cigarette smoking and the geographic distribution of adult chronic bronchitis. However, a direct causal relationship has not been demonstrated and it would be necessary to undertake a longitudinal study to assess this.

Asthma, too, is a condition that should engender particular concern, for despite the introduction of modern drug therapy (β₂ agonist bronchodilators and corticosteroids), mortality rates are rising. There are 3 possible explanations: 1) that the incidence of asthma is rising; 2) that treatment offered to asthma sufferers is ineffective; or 3) that the treatment itself is harmful, eg, by relaxing the concern prompted by asthma attacks.

Little impact on the incidence of asthma can be made until there is clear understanding of its etiology. Few clues are available to indicate the appropriate line of investigation; it is known that the disease is quite evenly distributed, there is no marked variation in prevalence according to social class, and the sex ratio is inconsistent. Moreover, the current theories on the etiology of asthma cannot survive as a universal explanation, and new ideas are needed.

Investigations by Burney et al have indicated that there is an association between asthma and a westernized lifestyle because asthma has been diagnosed for the first time in rural populations that migrate to urban centers. Projecting from these observations and the association between a Westernized lifestyle and salt consumption, they have found circumstantial evidence to support the hypothesis that salt consumption promotes bronchial reactivity.

CONCLUSIONS

It is clear that wide variation exists among countries in efforts devoted to different aspects of respiratory disease epidemiology.

Inroads into the mortality rate for chronic bronchitis and emphysema depend on prevention. Relatively little is known about how to deter children (especially girls) from beginning to smoke, but if this knowledge could be gained, dramatic reduction in smoking prevalence could be achieved.

The MRC/Derbyshire smoking study suggests that antismoking intervention at age 12-14 is the most effective, but more recent unpublished work suggests that different kinds of intervention may be necessary for different groups. For example, peer-led interventions may be more appropriate for girls and teacher-led ones more appropriate for boys. Obviously more work in this area would help identify these factors more precisely.

The claims (1) that “less harmful” cigarettes are being developed, and (2) that low tar cigarettes are less harmful to health than higher tar brands require careful investigation.

Outdoor pollution is no longer considered an important pathogenetic factor in respiratory disease. Investigation of indoor pollution, however, requires more work.

Also, as yet there has been little interest in monitoring and assessing the health effects of the processes associated with newer industries, eg, microchip and pharmaceutical production.

Perhaps the disorder requiring greatest thought is asthma, because there has been little explanation of the widespread increase in prevalence.

Research must be concentrated in the areas of uncertainty that have been outlined if the decline in respiratory disease is to be maintained.

REFERENCES


Epidemiology of Chronic Bronchitis in the Baltic Republics of the USSR

V. V. Utkin, M.D.; I. N. Stepanov, M.D.; P. A. Shnipas, M.D.; L. E. Yannus, M.D.; and G. B. Gintere, M.D.

Within the past 20 years, the prevalence of chronic nonspecific lung diseases has increased considerably in industrially developed countries. Thus, the contribution of this disorder to general morbidity, temporary and persistent disability, and population mortality has increased. Because the USSR is situated in various climatic regions (from polar territories to deserts and subtropics), with diverse atmospheric pollution levels in separate industrial...