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An Epidemiological Overview

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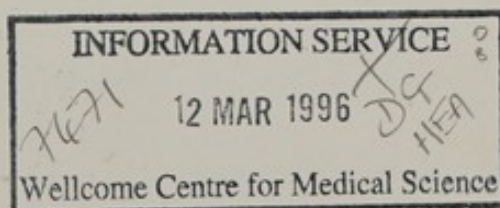
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Asthma

An Epidemiological Overview


THE
HEALTH
OF THE NATION



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SUMMARY FACT SHEET

Asthma (ICD 493)

PREVALENCE

Estimated percentage with asthma
sufficiently severe to require regular
medical supervision

Adults	4%
Children	4-6%

PRESCRIPTIONS

(England)

NUMBER OF PRESCRIPTIONS (in millions)

	1983 ⁽¹⁾	1993 ⁽¹⁾	1993 ⁽¹⁾	% change
		(consistent with 1983)	(total)	1983-93 (consistent basis)
Total prescriptions	315.3	405.1	445.4	+28
Asthma prescriptions	16.1	29.2	31.3	+81

NHS TREATMENT

PATIENT CONSULTING RATE

(England and Wales)
per 1,000 persons at risk

	1971/72	1981/82	1991/92 ⁽²⁾	% change 1981/82-1991/92
ALL AGES				
Males	10.6	20.0	42.9	+115
Females	8.6	15.9	42.2	+165

INCIDENCE REPORTED BY GP PRACTICES

(England and Wales)

Mean weekly incidence per 100,000 population

	1983	1993	% change 1983-93
Persons, all ages	17.31	50.32	+191

HOSPITAL CASES

(England)

numbers in thousands

	1982	1991/92 ⁽³⁾
	Discharges and deaths	Finished consultant episodes
Persons, all ages	58.3	103.2

(1) The basis of the prescriptions statistics was changed in 1991. Data for 1983 and 1993 (on a consistent basis) include prescriptions dispensed by pharmacists and appliance contractors only. Data for 1993 (total) also include prescriptions dispensed by dispensing doctors, and personal administration.
(2) Data for 1991/92 in press.

(3) A new system of hospital episode statistics was introduced in 1987 and these data are not consistent with those on the previous basis.

COST TO THE NHS

(England)

Estimates

		Asthma costs £ millions	Asthma as a % of total NHS cost %
Net ingredient cost of prescriptions	1993	347	11
Other NHS costs (excluding community health services)	1989/90	72	0.6

MORTALITY

(England)

NUMBER OF DEATHS (3 year averages shown under the central year)⁽⁴⁾

	1971	1981	1985	1991	% change 1985-91
ALL AGES					
All Persons	1,155	1,439	1,781	1,710	-4
Males	475	612	763	704	-8
Females	680	827	1,018	1,006	-1

UNDER 65 YEARS

All Persons	704	711	812	632	-22
Males	317	344	405	322	-21
Females	387	366	407	310	-24

AGE STANDARDISED MORTALITY RATE

(3 year averages shown under the central year)⁽⁴⁾

per 100,000 population

PERSONS	1971	1981	1985	1991	% change 1985-91
All ages	2.38	2.73	3.26	2.90	-11
Under 65 years	1.77	1.81	2.04	1.60	-21

(4) See paragraph 5.4.1 on the changes in the coverage of asthma deaths in this period. The percentage change is shown for the longest period for which consistent data are available.

KEY POINTS

PREVALENCE

There are no comprehensive data on the prevalence of asthma. However, some relevant information is available.

Surveys show that asthma is an important cause of illness in children. It was the cause of long-standing illness reported most frequently for children in the General Household Survey. Not only do fewer adults than children report asthma but, with increasing age, other conditions are much more commonly reported.

The data suggest that more boys than girls have asthma but the difference between the sexes reduces with age and is not evident among adults.

It has been estimated that the prevalence of asthma sufficiently severe to require regular medical supervision is from 4% to 6% in children and about 4% in adults.

TREATMENT FOR ASTHMA IN THE NHS

There have been sharp increases in the recorded treatment of asthma in the National Health Service (NHS) in the last decade:

- prescriptions for asthma have increased by three-quarters (after allowing for changes in the coverage of the statistics)

- the GP consulting rate has more than doubled

- the number of hospital in-patient treatments has nearly doubled, although the increase has flattened off in recent years; part of the increase was due to changes in the basis of the statistics.

It is unlikely that either the number of people with asthma or the number of episodes of asthma requiring medical treatment have risen as much as these statistics. In addition to changes in the basis of the statistics, some of the increases in recorded treatment are likely to have been due to an increased use of the term "asthma" for respiratory conditions, changes in treatment practices and changes in the tendency of people, particularly the parents of children, to seek medical care.

Children are much more likely than adults to be treated as hospital in-patients for asthma and children under 15 currently account for about a half of all finished consultant episodes for asthma.

The GP consulting rates for children for asthma are also much higher than those for adults.

In 1993 prescriptions for asthma accounted for 7% of all NHS prescriptions and their net ingredient cost of £350 million was 11% of the net ingredient cost of all prescriptions.

Treatment for asthma, other than prescriptions, is estimated to account for less than 1% of total NHS cost for these services.

MORTALITY

Asthma causes over 1,600 deaths per year; it accounted for 0.3% of all deaths in England in 1992.

Asthma deaths occur mainly in elderly people; only 2% are in children under 15 years of age, compared with more than 60% in people aged 65 and over and some 40% in people aged 75 and over.

The total number of asthma deaths has risen over the last two decades, although not in the most recent years. The increase reflects largely the growth in the number of elderly people in the population and changes in the basis of the statistics.

The number of deaths from asthma among persons aged under 65 fluctuated in the last two decades but shows no underlying increase. It fell by 20% between 1984-86 and 1990-92.

The age-standardised mortality rate for asthma, which adjusts for the change in the age structure of the population, has also fluctuated but has fallen by more than 10% since the middle of the nineteen-eighties.

There is no clear geographical pattern of asthma mortality within England, although individual health districts with high mortality among persons aged under 65 are rather more likely to be in the north than in the south of the country.

Standardised mortality ratios are significantly below the national average in Social Classes I and II for both men and women.

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Any errors and omissions are, however, the responsibility of the CHMU.

ASTHMA OVERVIEW

1 INTRODUCTION

1.1 PURPOSE

This overview is intended to provide a reference document which brings together a broad range of up-to-date statistics on asthma in a readily accessible form. The overview has been produced by the Department of Health (DH) and its target audience includes the medical and administrative members of the relevant DH policy branches, as well as DH expert committees. However, the overview is also aimed at experts and interested groups outside DH including organisations specifically concerned with asthma, clinicians, researchers, and public health doctors.

It is of course difficult to produce a single document which fully caters for the needs of such a wide-ranging audience, and the composition of the overview inevitably represents something of a compromise. In general the statistics have been presented as graphs with only a limited number of tables giving more detailed data. Some text has been provided to assist with interpretation of the graphs, however, the level of detail provided may fall short of that which some readers would prefer, and the text is restricted to objective descriptions of the data. It has not been possible to provide a full review of the academic literature on the subject.

1.2 GLOSSARY AND SOURCES

Although many of those at whom the overview is aimed will already be familiar with the technical terms employed, a glossary of selected terms has been provided in case clarification is required. The glossary also gives information about the main sources of the data used. The key sources of data and further information have been identified wherever possible¹. In many cases unpublished data have been used but published data are available in a different, usually less detailed, form; for example deaths by age and sex for asthma in England and Wales combined are published but data for England only are presented in the overview. In these cases the published source which provides the data closest to those used is indicated. Sources are given for the data in the figures or tables and these references are not repeated when the data are discussed in the text.

1.3 GEOGRAPHICAL COVERAGE

Wherever possible the data given in the overview relate to England. However, in some cases data are available only for England and Wales combined or for Great Britain as a whole. Comments in the text refer to England unless otherwise specified.

1.4 STRUCTURE OF THE OVERVIEW

This overview concentrates on national statistics, either those which are comprehensive, such as mortality, or based on samples which are nationally representative or broadly so. However, where such statistics are not available brief reference is made to smaller surveys conducted for research purposes. The overview covers successively the information available on prevalence of asthma from both national surveys and research studies, statistics of contacts with the National Health Service (NHS) relevant to morbidity, and mortality. It does not cover the causes of asthma in any detail but references are provided to other sources on this subject.

¹ Many statistics in the overview have been provided by the Office of Population Censuses and Surveys (OPCS). Further information on these can be obtained from OPCS. Telephone 0171 396 2229.

2 ASTHMA AND ITS IMPORTANCE

2.1.1 A definition of bronchial asthma is "a clinical syndrome characterised by widespread airways obstruction, which is reversible either spontaneously or with treatment" (1). However, whilst the presence of asthma can usually be established without difficulty in a clinical setting there are problems in determining asthma prevalence in epidemiological studies. Prevalence studies have usually identified asthma from questions relating to wheeze but this does not always allow asthma to be distinguished from other respiratory conditions especially in the very young and elderly persons. It can also lack sensitivity in that some people with asthma do not wheeze. Measuring lung function is not useful for epidemiological studies since it is often normal between attacks in persons with asthma and is abnormal in persons with lung disease other than asthma. A measurement of airway responsiveness to histamine or exercise is more valuable and has been used in a number of studies. In children the bronchoconstrictor response to exercise can be measured easily and provides an objective measure of bronchial irritability and, indirectly of asthma for epidemiological purposes.

2.1.2 The cause of asthma as a condition is unknown. There is clearly a genetic component to asthma but there is also evidence that environmental factors help to determine whether a person develops asthma. Which environmental factors are important is uncertain although asthma prevalence appears to be greater in populations with a westernised culture. Possible environmental factors include exposure to allergen by the mother or as a neonate, diet, viral infections and pollutants, including cigarette smoke. In adults a number of products have been identified as causing occupational asthma such as isocyanates, flour and wood dusts and it is estimated that over 1,000 people develop occupational asthma each year.

2.1.3 Once a person has asthma the symptoms may be brought on or exacerbated by exposure to allergens such as house dust mites, animal dusts, pollen, fungal spores, passive smoking or other air pollution; more general factors such as exposure to cold air or stress may also trigger attacks. People may become asthmatic at any time in their lives from early childhood to old age. Most children with asthma improve during adolescence and many have no symptoms, or only mild symptoms, as an adult. Further information on the causes of asthma may be found in references (2-11).

2.1.4 Not only is information about the causes of asthma limited but there are also relatively few statistics available on the allergens which may exacerbate the symptoms or trigger attacks and some of those which do exist cannot be summarised in a simple way suitable for this overview. Therefore no material of this type has been included.

2.1.5 Several different groups of experts have been set up to investigate asthma and related conditions or possible causes such as air pollution and their impact on health. The main groups established by the Department of Health (DH) and the Medical Research Council (MRC) are listed in the Annex. Groups dealing with matters relating to air quality have also been set up by the Department of the Environment (DoE). DH, DoE and the MRC have launched a joint research programme into air pollution and respiratory disease. This initiative is being taken forward by the MRC's Institute for Environment and Health and is in addition to the MRC's existing programme of research related to the causes and treatment of asthma.

2.1.6 Asthma accounts for less than one half per cent of all deaths occurring in England, although about a third of these are in persons aged under 65 compared with less than 20% of deaths from all causes. Asthma is, however, a major cause of ill-health particularly among children, for example it is the most commonly reported cause of long-standing illness among children. It is not only a burden to those who suffer from it and their families but represents a considerable cost to the NHS and to the economy in terms of days lost from school or work.

3 PREVALENCE AND INCIDENCE

3.1.1 There are no comprehensive data on the prevalence of asthma and the way in which it may be changing. Relevant data fall into two broad types. First, there are data from surveys which may be either nationally representative samples of the population or detailed research studies. Secondly, there are statistics of treatment in the NHS. Data from surveys and research studies are discussed in this section which also covers statistics of claims for sickness and invalidity benefit; NHS data are covered in section 4 below. All the data have limitations both as indicators of the prevalence of asthma and arising from the methods of collection etc. These are discussed more fully in the relevant sections. In addition the various statistics do not provide an entirely consistent picture. Nonetheless some broad conclusions may be drawn.

3.2 DATA FROM POPULATION SURVEYS (All these data relate to Great Britain)

3.2.1 Respondents to two large surveys of the population in private households in Great Britain provided information on whether they suffered from asthma. Results are presented in Figures 1 and 2. The age groups covered in these surveys and the questions asked were different and so the data obtained are not directly comparable. However, in both cases the surveys covered self-reported asthma based on the replies to a few questions. They are thus subject to a margin of error in that respondents may have misunderstood, misinterpreted or forgotten what has been said to them about their condition by a doctor. In addition, respondents, or some other unqualified person may have thought, incorrectly, that they had asthma.

3.2.2 Respondents to the General Household Survey (GHS) are asked "Do you have any long standing illness, disability or infirmity?". Those who reply positively are asked "What is the matter with you?". The Survey covers all persons in the household, whatever their age, with parents responding on behalf of children under 16. Figure 1 shows the percentages of total respondents to the survey who reported that they had asthma in response to the second question (more than one condition could be given). The data are from the 1988 and 1989 Surveys combined and are based on samples of nearly 19,000 males and 21,000 females.

3.2.3 Close to 4% of males of all ages reported asthma in the GHS in 1988 and 89 and a little over 3% of females. For adults (16 and over) prevalence was the same for both sexes at just under 3%. In general among adults the prevalence of asthma fell with increasing age. In the 45-64 age group and above a higher percentage of women than men reported asthma. For children under 16 asthma was the most common single cause of long-standing illness reported in the GHS; it was mentioned in respect of approaching 6% of them. Prevalence was higher for boys than girls; indeed among those under 5 reported asthma was twice as common among boys as girls. The age group for whom most asthma was reported was 5-15 years old. For girls aged 5-15 the percentage in respect of whom asthma was reported was almost twice as high as among those under 5.

3.2.4 The information from the GHS may be compared with that from the latest Study of Morbidity in General Practice (MSGP4), which provides data on consultations for asthma with general practitioners (see Section 4.1 below). The GHS indicated a slightly lower prevalence of asthma than MSGP4, particularly for females, just over 3% of whom reported asthma compared with 4% of patients consulting in MSGP4. It is possible that replies to the GHS underestimate the prevalence of asthma to some extent. There is evidence that people are more likely to report conditions if they are prompted by a list of names. In responding to a question like that used in the GHS, conditions which do not cause serious problems may be forgotten. However, this factor is unlikely to account for the main difference in the data from the two sources which is for children aged 0-4 years. Consulting rates for asthma for boys in this age group are twice the rates of reported long-standing illness for boys; for girls the difference is even greater. Whilst in the GHS reported asthma is considerably higher in the 5-15 age group than in younger children, consulting rates are now higher for the under 5s than for the 5-15 year

olds (though for MSGP2 and 3 this was not the case). Possible reasons for the different pattern may be that parents do not consider one or two episodes of asthma in a small child to be "long-standing illness" and so do not report it in the GHS and that with small children doctors may record a possible diagnosis of asthma in their records but not report it to the parents until they have further evidence.

3.2.5 The data in Figure 2 are taken from the Health and Lifestyle Survey (HALS) which has been conducted twice, in 1984/5 (HALS1) and 1991/2 (HALS2). Unlike the GHS, in which a new sample is selected each year, the HALS2 sample consisted of those of the HALS1 sample who could be traced and agreed to co-operate again in 1991/2. The sample consisted of some 9,000 persons in 1984/5 and over 5,000 in 1991/2. In 1984/5 the survey covered persons aged 18 and over; in 1991/2, because the same individuals were involved the youngest participants were 25. The surveys thus provide an estimate of changes in the health of respondents in the period between 1984/5 and 1991/2, though this may not be entirely representative of changes in the health of the adult population because of losses from the sample (including by death) between the two surveys.

3.2.6 The Health and Lifestyle Survey asked respondents whether they had ever had certain specified conditions of which asthma was the first in the list, i.e. it estimated life-time prevalence. It thus would be expected to produce a higher positive response than the GHS both because respondents were specifically prompted about asthma and because they were asked to report conditions which they had had but from which they were not necessarily currently suffering.

3.2.7 Figure 2 gives comparative data for persons who responded to both HALS1 and HALS2. Given the different basis of the statistics it is not surprising that the percentage of respondents who reported in HALS that they had ever had asthma was nearly twice as large as the percentage who cited asthma as a cause of long-standing illness in the GHS. In HALS1 5% of women and 6.5% of men said they had ever had asthma; the corresponding figures for HALS2 were 8.6% for women and 9.1% for men. These were increases of some two-thirds for women and nearly 40% for men. There were increases in virtually all age/sex groups. Part of the increase in reported asthma between the two surveys may be due to greater awareness of asthma leading to better recall and a greater propensity among doctors to describe respiratory conditions as asthma. The increase in reported asthma between the two surveys was much greater than those for other respiratory conditions. However, approximately twice the proportion of the sample reported having broncho-dilators or other anti-asthmatic medicines in HALS2 as in HALS1. These surveys also measured respiratory function and showed no deterioration in mean lung function between the two surveys other than would be expected due to the increasing age of the sample and no increase in the percentage with poor lung function.

3.3 RESEARCH STUDIES

3.3.1 There have also been research studies looking at the prevalence of asthma, chiefly in children and most relating to a small area of the country. Whilst they cover the topic of asthma, and in some cases related conditions, in much more detail than the surveys reported above they do not provide information for all age groups and even for those covered the data may not be a reliable guide to the prevalence of asthma across the country as a whole. This section does not attempt comprehensive coverage of all such studies but summarises some key results and references.

3.3.2 There is no single definition or precise objective measure of asthma used in all studies. It is thus difficult to produce an overall estimate of prevalence from studies conducted in different places and times and on children of varying ages, or to assess accurately whether prevalence is changing (12).

3.3.3 In recent studies in which the parents of schoolchildren have been asked questions about their children's health the percentage saying that their child has wheezed in the last year has ranged from about 12% to 15% (13-17). The percentage of children for whom frequent attacks of wheeze were reported was considerably less eg in two studies 4% and 6% were reported to have had four or more attacks in the last year and in another study 3% of children were reported to have had five or more attacks (13-15). From 9% to 13% of children were reported to have had asthma diagnosed by a doctor (14-17).

3.3.4 Some indication of changes in the prevalence of asthma among children is provided by studies which have been repeated over time. The National Study of Health and Growth (18) covered asthma and related conditions in a nationally representative sample of children for several years and several studies of children in specific areas asked the same questions in respect of similar groups of children more than once. These studies have spanned periods from three to twenty-five years and their results are not entirely consistent but most studies show an increase in wheeze ranging from modest to substantial and a larger increase in diagnosed asthma. A fall in reported bronchitis but an increase in eczema and hay fever were also shown in studies which covered these topics (16-18).

3.4 OVERALL ESTIMATES OF PREVALENCE

3.4.1 On the basis of all the available data it has been estimated that "the prevalence of asthma sufficiently severe to require regular medical supervision is from 4-6% in children and about 4% throughout the rest of life" (19). In addition the data suggest some real increase in asthma among children, and HALS indicates also in adults, but part of the increase in reported asthma and in the use of health services ascribed to asthma is likely to be due to a greater tendency among doctors to confirm respiratory conditions as asthma. The public may also be more aware of asthma and related problems and so more likely to report them in surveys.

3.4.2 It is planned to cover asthma in the Health Survey for England in 1995. This should give information on asthma and related conditions for a large nationally representative sample of both adults and children but results are not expected to be available until early 1997.

3.5 CLAIMS FOR SICKNESS AND INVALIDITY BENEFIT (These data relate to Great Britain)

3.5.1 Figure 3 shows statistics of claims for sickness and invalidity benefit for asthma. Eligibility for National Insurance Sickness Benefit has changed considerably over the period covered, notably with the introduction of Statutory Sick Pay (SSP) in April 1983 and its extension in April 1986. These changes are described more fully in the glossary. Their effect has been to exclude from the National Insurance scheme many claims for short periods of sickness absence. In spite of this there have been substantial increases in both spells of incapacity and days of incapacity in total and for asthma, particularly since 1986/87. The Figure gives days of certified incapacity due to sickness and invalidity caused by asthma and the number of spells of incapacity at the end of the statistical year. Both show very similar patterns with a modest increase over the period from 1979/80 to 1986/87 (indeed with small falls in 1983/84 and 1986/87, no doubt reflecting the changes in the scheme referred to above). However, since 1986/87 the numbers of both days and spells of incapacity have risen rapidly, more than doubling over the period to 1991/92. In that year there were 11 million days of certified incapacity due to asthma and 36,000 spells of incapacity with asthma at the end of the year. It is unlikely that all the increase in claims for benefit for asthma reflects a real increase in prevalence or ill health due to asthma. It may reflect in part increasing difficulty among those with chronic health problems in obtaining or retaining employment. This view is supported by the fact that the pattern of changes in claims for benefit for asthma has been broadly similar to that for claims for all causes. However, the rises in recent years for asthma have been a little larger than those for claims in total. Between 1986/87 and 1991/92 days of incapacity for all causes and total spells of incapacity at the end of the year increased by some two-thirds.

4 TREATMENT FOR ASTHMA IN THE NATIONAL HEALTH SERVICE

4.1 DATA FROM GENERAL PRACTICE (All these data relate to England and Wales)

4.1.1 Patient consulting rates for asthma in 1971/2, 1981/2 and 1991/2 are shown in Figure 4. These are obtained from successive National Studies of Morbidity in General Practice (MSGP2, 3 and 4; the full report giving detailed data from MSGP4 is currently in press). In these studies a sample of general practices provide information about all consultations in a year including the reason for consultation. Consulting rates, showing the percentage of the total patients of the practices who consulted in the year for a particular cause can thus be calculated. Although the population covered by the participating practices is as far as possible representative of the national population the practices themselves are not entirely representative and this may have a small impact on the diagnoses recorded or the propensity of patients to consult.

4.1.2 In 1991/2 (in MSGP4) just over 4% of patients consulted their General Practitioner (GP) for asthma. Consulting rates were highest for children, particularly boys, with almost 10% of boys and 7% of girls aged 0-4 consulting. Overall 8% of children aged 0-15 consulted their GPs for asthma. Among males consulting rates in 1991/2 declined with age up to the 25-44 age group; in this and the 45-64 age group fewer than 3% of men consulted their GP for asthma. Consulting rates for men were somewhat higher in the older age groups. Among females there was no consistent pattern in consulting rates over age 25 but in 1991/2 the lowest consulting rates were for women aged 75 and over, and there was a broadly similar picture in the previous studies. This is in marked contrast with the pattern of deaths which are predominantly among older women. Consulting rates for adult women were a little higher than those for men in MSGP4 (though this did not apply in the earlier studies). Consulting rates for boys have been substantially above those for girls. In MSGP2 and 3 they were almost twice as high but in MSGP4 the difference was less.

4.1.3 The successive studies show very marked increases in consulting rates over the period from 1971/2 to 1991/2, with rises for all age/sex groups between each survey and particularly sharp increases between 1981/2 and 1991/2. In this later period the consulting rate for asthma for all persons more than doubled; for boys under 5 the rate trebled and for girls under 5 the consulting rate increased by nearly four times. (However, caution is needed in interpreting these increases as the number of new asthmatics appears to have been the same in 1981/2 and 1991/2. This is indicated by the rate of "first episodes" of asthma which did not change between MSGP3 and MSGP4, although there was some rise for children under 5.)

4.1.4 Figures 5 and 6 show episodes of asthma reported by practices in the Weekly Returns Service of the Royal College of General Practitioners in which a somewhat smaller sample of GPs provide data on a limited range of conditions on a continuous basis. Figure 5 shows the distribution by age and sex and demonstrates again the markedly higher rates for children, particularly young children, than for adults and the slightly higher overall rates for males. Mean weekly incidence of asthma in twelve week periods is shown in Figure 6. Interpretation of the data is difficult because they fluctuate a good deal and because particularly sharp increases in 1987 and 1991 may be artefactual due to changes in systems and the inclusion of additional practices. However, an underlying rising trend in the incidence rate is apparent.

4.2 PRESCRIPTIONS

4.2.1 The number of prescriptions for preparations used primarily for the treatment and prevention of asthma are shown in Figure 7 and Table 1. Some of these prescriptions may be for the treatment of chronic obstructive airways disease and not for asthma, but the proportion of the total for which they account is unknown. Data for 1980 to 1990 cover prescriptions dispensed by community pharmacists and appliance contractors only; for 1991 to 1993 they also include prescriptions dispensed by dispensing doctors and personal administration. In 1991 the

categories of prescriptions added for the first time accounted for about 9% of all prescriptions. Prescriptions for asthma preparations nearly doubled between 1980 and 1990 and showed a further increase on the new basis of about 13% between 1991 and 1993. Asthma prescriptions have increased a good deal faster than prescriptions as a whole, which on a comparable basis rose by 19% between 1980 and 1990; in 1993 asthma prescriptions were 7% of total prescriptions. In 1993 corticosteroids accounted for more than a quarter and selective beta(2)-adrenoceptor stimulants for more than a half of asthma prescriptions so that together they were over 80% of the total. Prescriptions in both these groups have increased rapidly over the period covered - the former by more than six times.

4.2.2 Prescription of asthma preparations per head of population by Regional Health Authority (RHA) are shown in Figure 8. These are considerably higher in the north of England than the south. However, a similar pattern is evident for all prescriptions and so that for asthma preparations may reflect general differences in prescribing patterns rather than differences in the prevalence of asthma.

4.3 HOSPITAL IN-PATIENT TREATMENT

4.3.1 Hospital in-patient treatments in the last decade with numbers and rates per 1,000 population by age group are shown in Figures 9 and 10. For 1981-1985 the data are from the Hospital In-patient Enquiry (HIPE), a 10% sample of discharges and deaths (excluding day cases); for 1987/88 onwards they are from the Hospital Episode System (HES) and are numbers of finished consultant episode ordinary admissions and day cases. No data are available for 1986 or for the first quarter of the calendar year 1987. Part of the rise shown in the figure between 1985 and 1987/88 will be due to the change in the statistics and it is inadvisable to compare the data on the two bases. In addition, in the early years of the new system data were not recorded for all patients and for those in respect of whom there was a record, diagnosis was sometimes omitted. Estimates have had to be made for the missing data.

4.3.2 Between 1981 and 1985 deaths and discharges with a main diagnosis of asthma rose by more than 40% overall. This compares with an increase of less than 10% in deaths and discharges for all patients with a diagnosis over the same period. For asthma, deaths and discharges among children under 5 rose by more than 80% and there were also relatively large rises for persons aged 75 and over. Figure 10, presenting rates per 1,000 population gives a somewhat different picture. Although the rate of deaths and discharges for those under 5 rose much faster than for other age groups (at nearly 15% per year) the rates for persons aged 75 and over did not, demonstrating that part of the increase in deaths and discharges for the older age groups reflected increased numbers of persons in the groups.

4.3.3 From 1987/88 to 1991/92, in contrast to the earlier period, the number of hospital episodes for asthma rose by under 2 per cent per year which is less than half the rate of increase in total episodes with a diagnosis. In addition, the fastest increases in episodes for asthma were among elderly people whilst episodes for children under 15 as a whole were virtually unchanged. Part of the large increase in consultant episodes for persons aged 85 and over was due to the increase in the population in this age group but, even when expressed as rates per head of population in Figure 10, this group, together with those aged 75-84, showed a much greater increase in episodes than younger people.

4.3.4 The recorded changes in the number of in-patient treatments for asthma over the period covered should be viewed with some caution. The jump between the figures for 1985 and 1987/88 is difficult to explain by changes in the coverage of the data. There are relatively few day cases for asthma (they accounted for less than 1% of the total in 1989/90) and the change in the basis of the statistics should not have had a large impact. It is possible that hospital episodes for asthma were over-estimated in the grossing-up for missing episodes in 1987/88 and 1988/89. However more recently the data were much more complete and their quality should be higher.

Hospital admissions for the East Anglian region and for Wales have been studied in some detail (20). The authors considered that the change in information systems had probably affected the data for several years. Nonetheless they concluded that after a long period of increases in admissions attributed to asthma there was now some evidence of a change in the trend and possibly even a decline in admission rates.

4.3.5 Figure 9 illustrates the predominance of children among asthma patients in hospital. In 1991/92 children under 5 accounted for a third of finished consultant episodes and those aged 5-14 for almost a fifth. Episodes for persons aged 65 and over were only 10% of the total. The age groups in Figure 9 are of different sizes; the rates in Figure 10 adjust for this and show that in 1991/92 children under 5 were almost six times as likely as persons in any adult group to have hospital episodes for asthma and those aged 5-14 almost twice as likely. There was relatively little difference between the episode rates for adult groups although the rates for persons aged 85 and over were rather lower than those for other adults.

4.3.6 The hospital in-patient data relate to episodes (or deaths and discharges) only. They do not indicate the numbers of people involved and the same person could be admitted several times during a year. It is impossible to tell the extent to which changes over time in admissions reflect changes in the number of people receiving treatment or in the numbers of treatments per person. Some light is shed on this problem by the material in Figure 11. This is taken from the Oxford Region record linkage study and for the period covered in the figure (1968-1985) relates to deaths and discharges from hospital. The study links discharges and deaths for individuals during a year so that the numbers of discharges and the numbers of persons involved can be compared. This is done in Figure 11 which shows deaths and discharges for asthma for all persons and for those aged 0-14 expressed as rates per head of population. The data relate to persons resident in and treated in Oxfordshire and West Berkshire only. Patient discharges were of course higher than the numbers of individual persons treated but the rates of change for the two series for the corresponding age groups were broadly similar. For all ages the discharge rate over the period covered rose by 95% and the numbers of individuals involved by 84%, while for children under 15 the increases in the two series were even closer.

4.3.7 If the Oxford data can be generalised to England as a whole they suggest that the rise in the numbers of in-patient treatments may overestimate only slightly the increase in the number of individuals admitted to hospital one or more times. However the rise in the numbers of persons with asthma of a given severity may not have been of a similar order as there may have been changes in the propensity to admit persons with asthma as well as changes in diagnostic practice.

4.3.8 Hospital episodes for asthma, expressed as rates per 10,000 population for Regional Health Authorities, for the combined years 1987/88 to 1991/92 are shown in Figure 12. There is no clear pattern of regional variation, though regions containing all or part of conurbations are rather more likely than others to have rates at or above the average. There was no obvious correspondence between the ranking of hospital episodes and the Standardised Mortality Ratios (SMRs) by region.

4.4 THE COST OF ASTHMA TO THE NATIONAL HEALTH SERVICE

4.4.1 Much of the cost of asthma to the NHS is attributable to prescriptions. Not only are there many prescriptions for asthma medicines but such medicines are also relatively expensive. In 1993 their net ingredient cost approached £350 million, some 11% of the net ingredient cost of all prescriptions. (Net ingredient cost is the basic price of a drug before discounts and the addition of dispensing costs or fees.) Estimates (subject to a substantial margin of error) have been made for the financial year 1989/90 of the cost of other NHS services, except community health services. It is estimated that the cost of services for asthma was some £70 million, which was less than 1% of the total cost of these services.

5 MORTALITY

5.1 GENERAL

5.1.1 The data on mortality show a very different pattern from those on morbidity. While recorded illness and National Health Service treatment is predominantly among children, most deaths occur among elderly people. There are currently some 1,700 deaths a year from asthma in England. The number fluctuates irregularly from year to year; in general averages for three years have been used in the graphs of mortality data and related text in this overview, presented as applying to the central year, in order to smooth out the fluctuations. Asthma accounted for 0.3% of deaths in 1991, but 0.7% of those among persons aged under 65 and 0.9% of deaths among those under 25.

5.2 TRENDS

5.2.1 There are a number of problems in examining trends in asthma mortality over the last twenty years. In particular, due to changes in the classification (in 1979) and coding (in 1984) of the underlying causes of death. These problems are discussed more fully below. Breaks are shown in the Figures and Tables when these changes occurred and, although in some cases percentages changes are given below for periods spanning the changes, too much weight should not be put on the precise figures.

5.2.2 Trends in age standardised mortality rates over the last twenty years for males and females of all ages and for those aged under 65 are shown in Figure 13. In spite of the problems with the data, clear patterns for both sexes and age groups can be seen of falls in the first half of the nineteen seventies, followed by sharp increases between the mid-seventies and mid-eighties. Since then death rates have again fallen substantially - by more than 10% for both men and women in total and by more than 20% among those aged under 65. Since 1979 the gap between the rates for persons under 65 and those of all ages has tended to widen with rates for the former rising less and falling more than for the latter. At the start of the period covered, standardised mortality rates for women were well above those for men both in total and for the under 65s. However, the gap between the sexes closed with a faster rise for men than for women between the mid-seventies and mid-eighties; since then there has been little difference between the sexes.

5.2.3 Figure 14 provides an age breakdown and it will be seen that mortality rates increase with age and that the differences between age groups have widened over the period covered. In the youngest age groups (under 35) there were clear falls in death rates up to the second half of the nineteen seventies and further falls in recent years. All groups under 55 show a fall in the most recent period. For older people the pattern of recorded deaths from asthma is very different. In the 55-74 age group death rates rose by some 40% in the first fifteen years covered but have since stabilised and shown some indication of a fall. However, there were substantial rises throughout the period in death rates for the oldest age group (75 and over). In this group mortality rates for both men and women more than doubled between 1969-71 and 1990-92. The mortality rates are age standardised within the age groups and so the rise over the period is probably not attributable to the increase in the elderly population. However, the standardisation has been done within five year age bands which may not have entirely eliminated the effect of the change in age structure. The interpretation of the trend in asthma mortality among elderly persons is discussed further in paragraph 5.4.2.

5.3 DISTRIBUTION OF DEATHS

5.3.1 The actual numbers of deaths (three year averages) from asthma at ten year intervals are shown in Figure 15. It will be seen that there has been a substantial rise in asthma deaths for women - of 48% between 1971 and 1991, entirely due to deaths in those aged 55 and over which increased from 65% of the total in 1971 to 84% of the total in 1991. For men deaths

from asthma also rose by 48% between 1971 and 1991 with deaths in the 55 and over age group increasing from under 60% to nearly three-quarters of the total over the period. Recorded deaths among those aged 75 and over have risen particularly sharply; those for men in 1991 were almost four times higher than deaths in 1971 and the increase for women was only a little less. Because the population in this age group has also been increasing rapidly death rates have risen less, but still very substantially, as indicated above.

5.3.2 In contrast asthma deaths among those under 35 have fallen both in absolute terms and as a percentage of the total; for men they declined from 20% of the total in 1971 to 12% in 1991 and for women they fell from 12% of the total to 6% over the same period. Deaths of those aged under 15 have fallen particularly sharply, though they fluctuate considerably from year to year; in 1991 there were fewer than 30 asthma deaths in total in this age group.

5.3.3 Figure 15 demonstrates the extent to which the number of asthma deaths for women exceeds that for men; in 1991 there were 43% more female asthma deaths than male. However, the sex distribution differs according to age. Below the age of 35 both the number and rate of male deaths exceeds that of female deaths; above the age of 55 the reverse applies. This pattern of a male excess in the younger age groups and a female excess in the older groups is also evident in some of the morbidity statistics.

5.4 PROBLEMS OF INTERPRETING THE MORTALITY DATA

5.4.1 Part of the increase in recorded deaths from asthma is due to the introduction of the Ninth Revision of the International Classification of Diseases (ICD) in 1979 and to a change in the coding of underlying causes of death in 1984. Work was done by the Office of Population Censuses and Surveys (OPCS) to show the immediate effects of these changes and suggests that their combined effect was to increase recorded asthma deaths by more than a third. The coding change alone means that recorded deaths among those aged 75 and over were some 15% higher in 1984 than they would have been without the change.

5.4.2 It is possible that much of the apparent increase in asthma mortality among elderly people is due to changes in diagnostic and certification practices with deaths being recorded as due to asthma which might formerly have been attributed to other respiratory conditions. Figure 16 shows recorded deaths from selected respiratory conditions among those aged 65 and over and suggests the possibility of substantial shifts between categories over the last twenty years. The category "chronic airways obstruction not elsewhere classified" was introduced into the ICD in 1979. Since then there appears to have been a gradual move in the classification of deaths from chronic bronchitis to this heading. The change in coding procedure in 1984 resulted in a reclassification of a substantial proportion of deaths which would previously have been included under pneumonia, particularly among the elderly. Although there is little direct evidence of a shift of a substantial number of deaths to asthma a small percentage switch from some of the other related headings covering a large number of deaths would have had a relatively large impact on the number of recorded asthma deaths.

5.5 COUNTRY

5.5.1 Data on deaths from asthma for countries outside the United Kingdom are not readily available and it has been suggested that differences between countries reflect different diagnostic practice as much as differences in true levels of asthma mortality (21). Therefore no international comparisons are presented here. Data (three year averages) for the different countries of the UK are compared in Figure 17. Since 1971 standardised mortality rates in England and Scotland have usually been below those for Wales and Northern Ireland (though rates for the latter show relatively large fluctuations). Over the period since 1984 as a whole the standardised mortality rates for asthma for Wales and Northern Ireland were one-third higher than that for Scotland and 10% above that for England. For persons aged under 65 the differences between the countries have been less consistent, although since 1984 the standardised mortality rate for Northern Ireland has been somewhat higher than those of the countries of Great Britain.

5.6 AREA

5.6.1 Standardised Mortality Ratios (SMRs) for asthma are shown for the fourteen former Regional Health Authorities (RHAs) in Figure 18 for all ages and Figure 19 for deaths at ages under 65. These Figures are supplemented by Tables 4 and 5 which give numbers of deaths by RHA and mortality rates respectively. (Note that the ratios and rates do not give precisely the same ranking for RHAs but the general picture is the same.) Because the numbers of deaths in regions are small, combined data for the five latest available years have been used in all cases, nonetheless the data for individual age groups should still be used with caution as they are likely to fluctuate from year to year. The SMRs for all ages for North Western, East Anglia, Northern and Trent RHAs were significantly above that for England while those for Yorkshire and South East, North East and South West Thames RHAs were below. If deaths below age 65 only are considered, the pattern is somewhat different and SMRs for few RHAs were significantly different from that for England; only North Western and Northern RHAs were significantly high and South West Thames significantly low. The data in Table 4 show very marked differences in mortality rates for the 85 and over age group with the rate for the highest region (East Anglia) being almost three times that for the lowest region (Yorkshire). Different practices in diagnosing respiratory conditions among the very elderly may be a factor in this variation, as differences between regions are much less in the younger age groups. North Western and Northern RHAs show particularly high mortality rates in the 45-74 age ranges.

5.6.2 Figure 20 is a map indicating those District Health Authorities (DHAs) for which the SMR for all ages was significantly above or below the expected value i.e. that for England as a whole. It is based on districts as they existed at 1 April 1993. Although there was a very wide spread of SMRs for districts the numbers of deaths within individual DHAs, even over five years, were small. In consequence the SMRs for relatively few DHAs differed significantly from that for England. Although the data have not been analysed in detail, they show no obvious patterns of variation in total asthma mortality according to type of area or part of the country. Indeed there were a number of cases where a district with a significantly raised SMR was adjacent to one with a significantly low SMR. Areas with pockets of high mortality ratios were East Anglia, the West Midlands, Greater Manchester, the far North East of England and South Yorkshire/North Nottinghamshire. The DHA with the highest SMR in the country was Tameside and Glossop (North Western RHA) and that with the lowest SMR was Dartford and Gravesham (South East Thames RHA). SMRs for persons aged under 65 have also been calculated but even fewer of these were significantly different from 100. However, among those that were, districts with significantly raised SMRs were predominantly in the north of England and urban and those with significantly low SMRs were predominantly in the south of England and rural or suburban.

5.7 SOCIAL CLASS

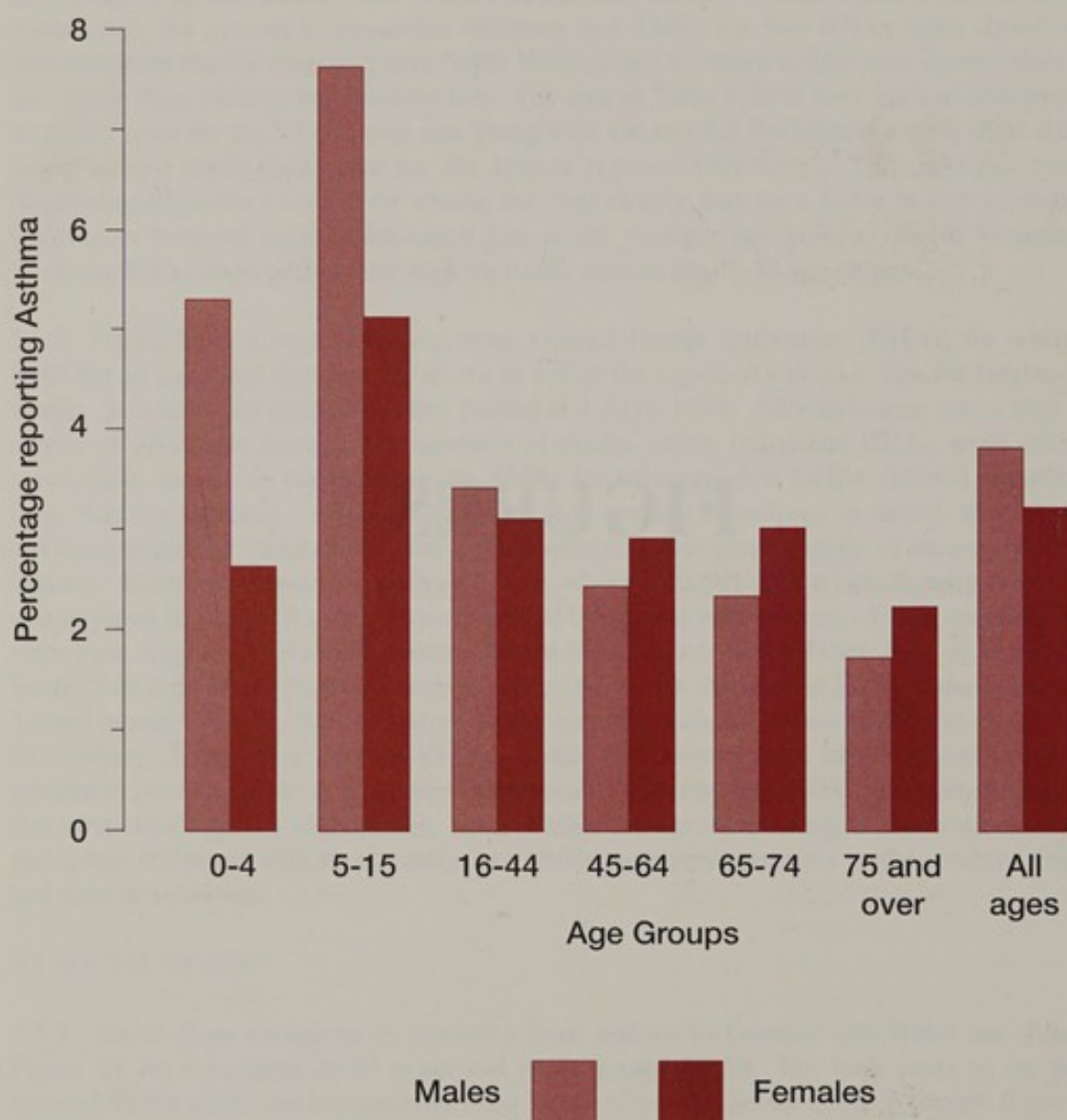
5.7.1 Social class variations in mortality from asthma in England and Wales are shown in Figure 21 for men aged 20-64 years and women aged 20-59. For both sexes in the period covered SMRs increased substantially from Social Class I to Social Class V, though for women the SMRs for Social Classes IV and V were not significantly different from the national average. Occupational asthma may contribute to some of the excess in Social Classes IV and V. (In contrast to the mortality data, standardised patient consultation ratios in general practice for 1981-1982 showed no significant differences by social class for males but some evidence of a social class gradient for females, for whom the standardised ratio for Social Classes IV and V was significantly above that for Classes I and II.)

FIGURES

Figure 1

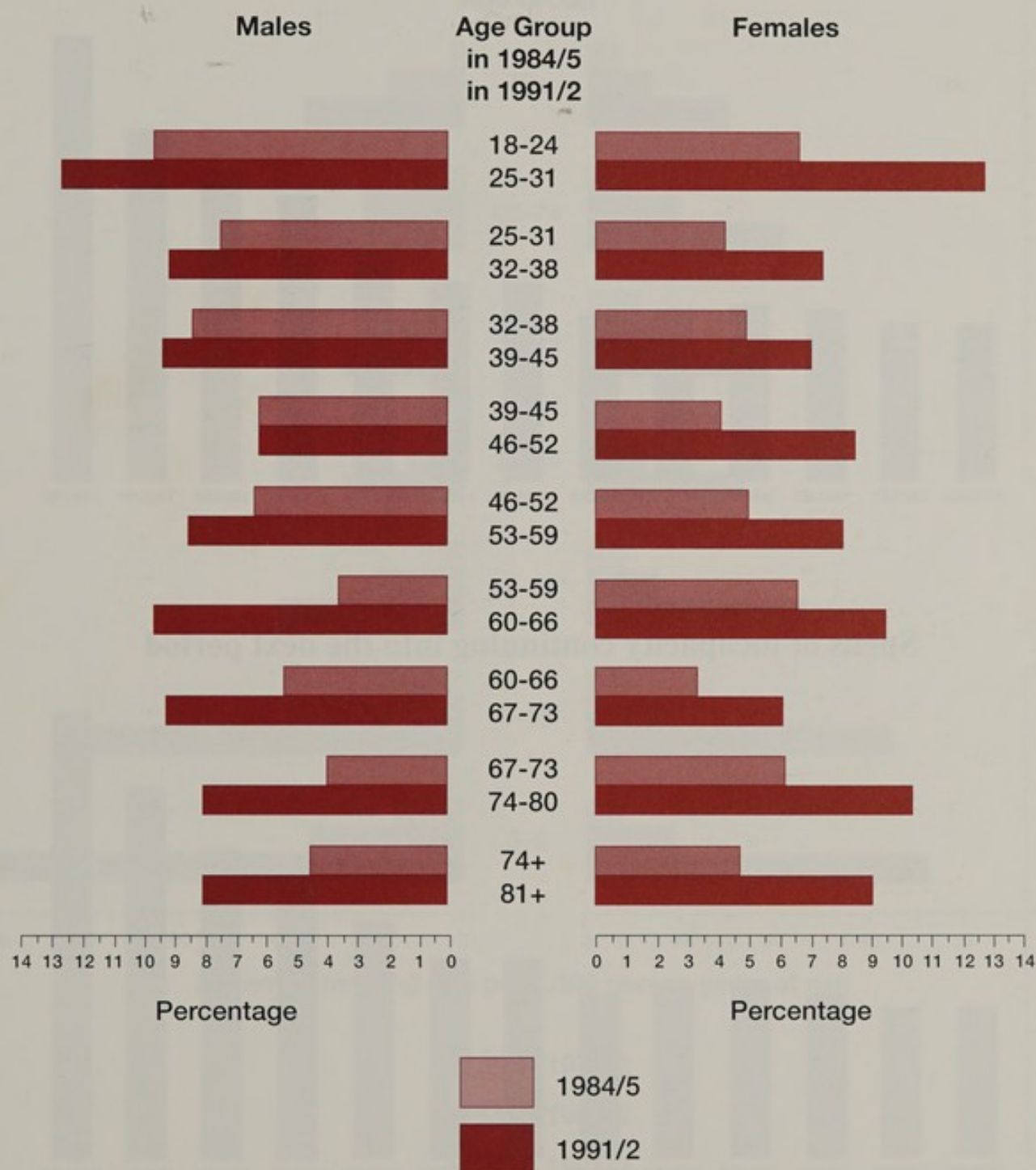
Self-reported Long Standing Illness: Percentage of population reporting Asthma

by sex and age Great Britain 1988 and 1989



Source: OPCS General Household Survey

Change in Self-reported Asthma: **Percentage reporting ever having suffered from Asthma** by sex and age Great Britain 1984/5 and 1991/2



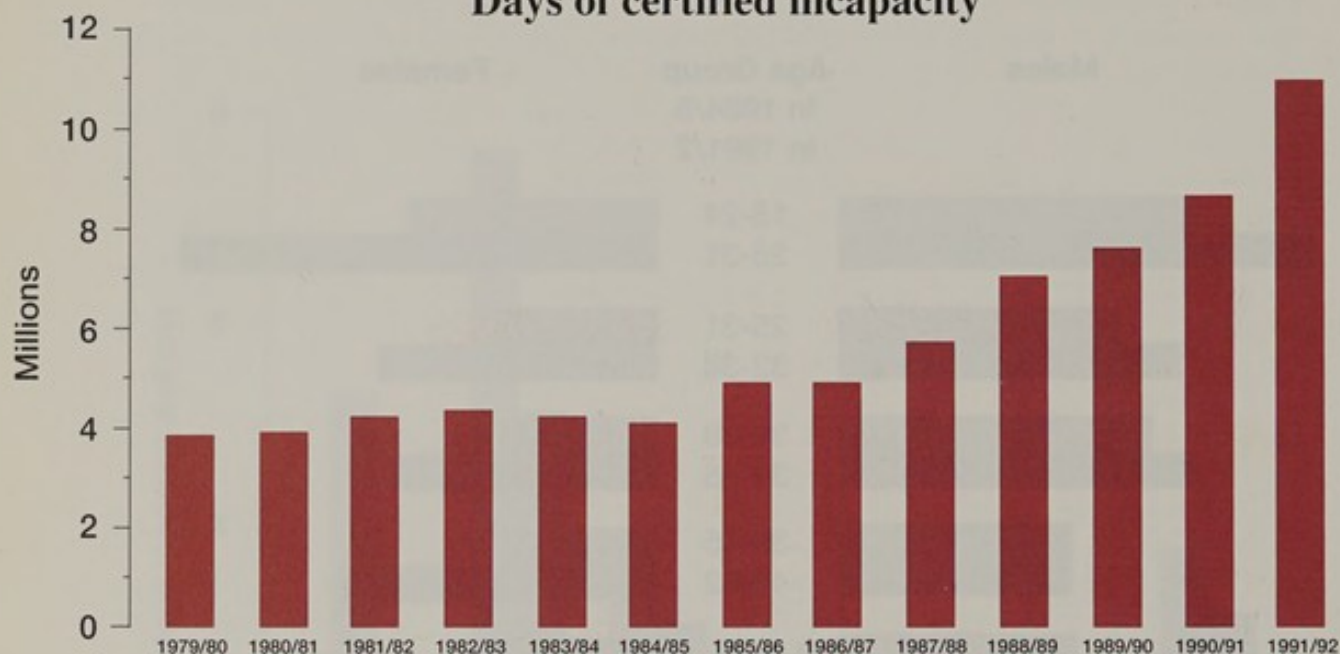
Source: The Health and Lifestyle Survey: Seven Years On

Figure 3

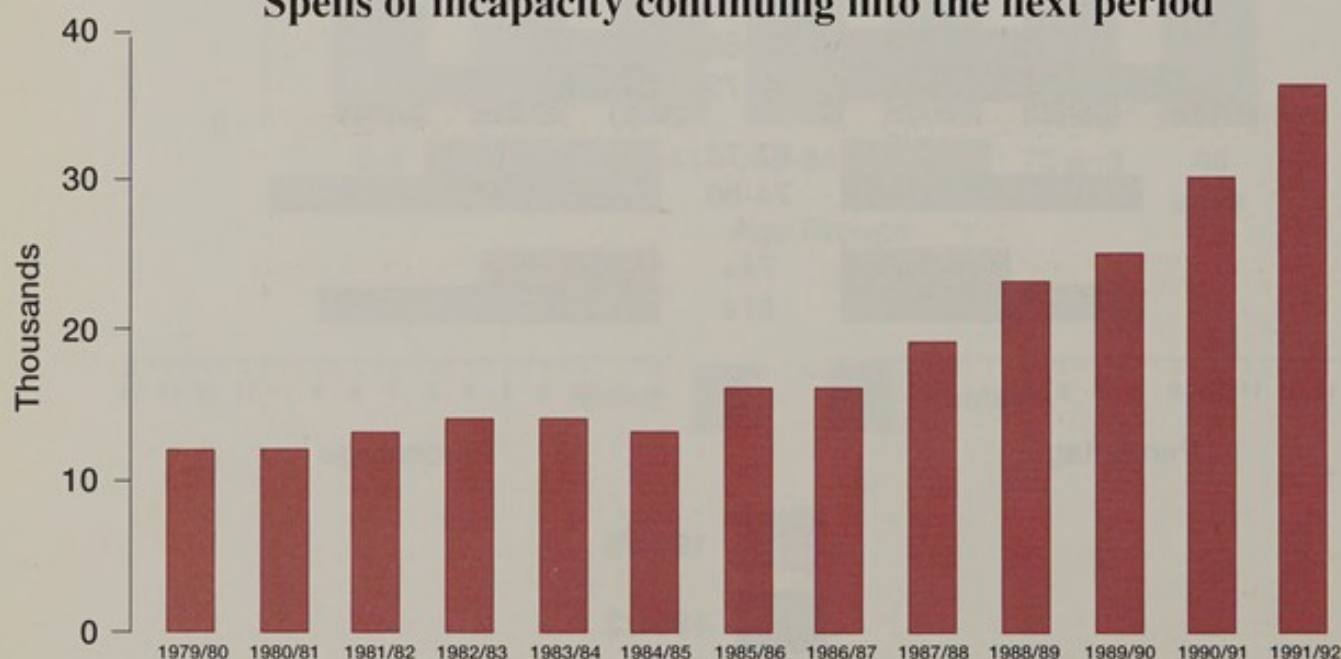
Sickness and Invalidity Benefit* for Asthma

All persons Great Britain 1979/80-1991/92

Days of certified incapacity



Spells of incapacity continuing into the next period

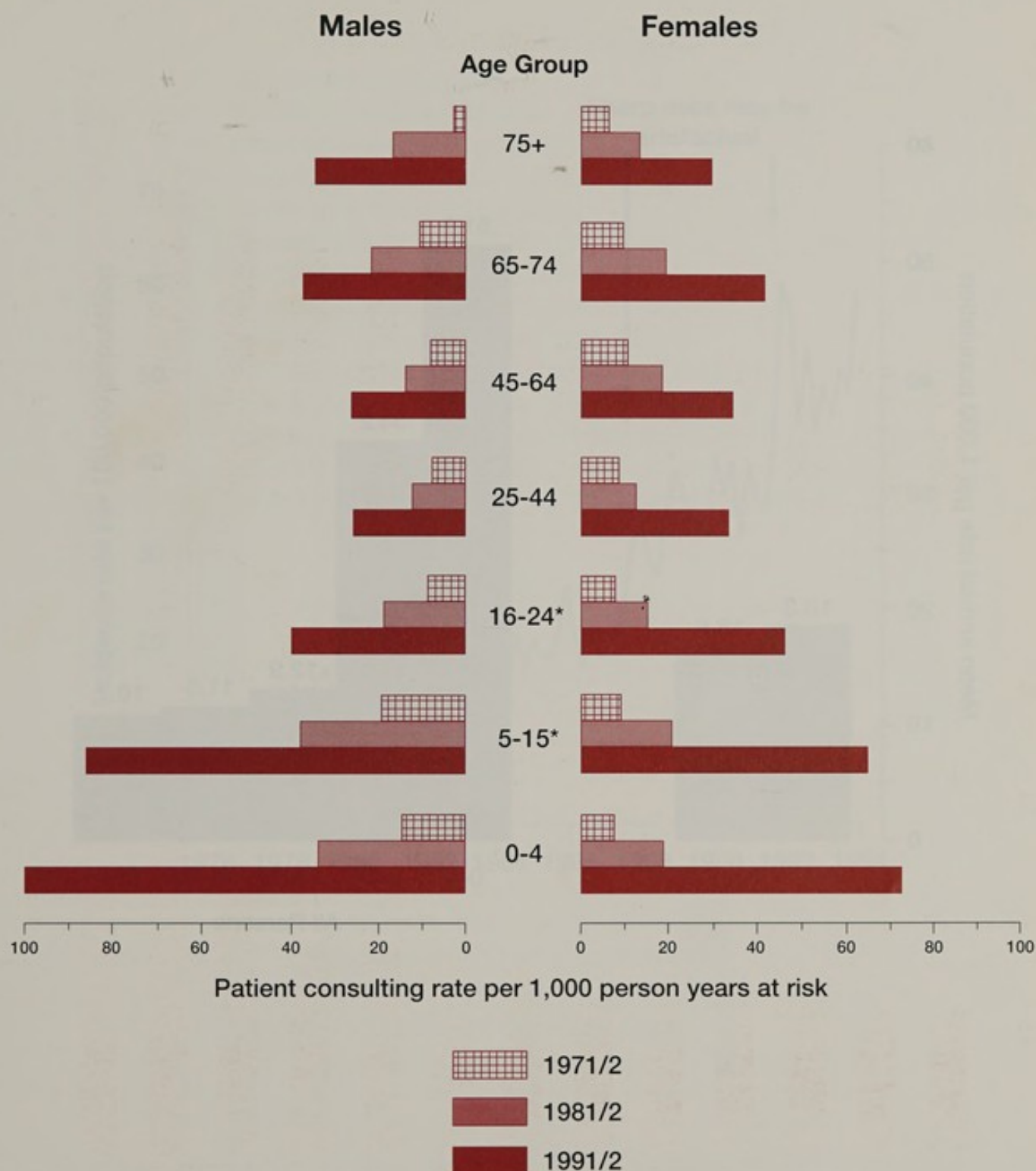


* Data are based on a 1% sample of claims. See text and glossary for problems in their interpretation.

Source: Department of Social Security (Unpublished data)

Patients Consulting their GP for Asthma

by sex and age England and Wales 1971/2, 1981/2, 1991/2



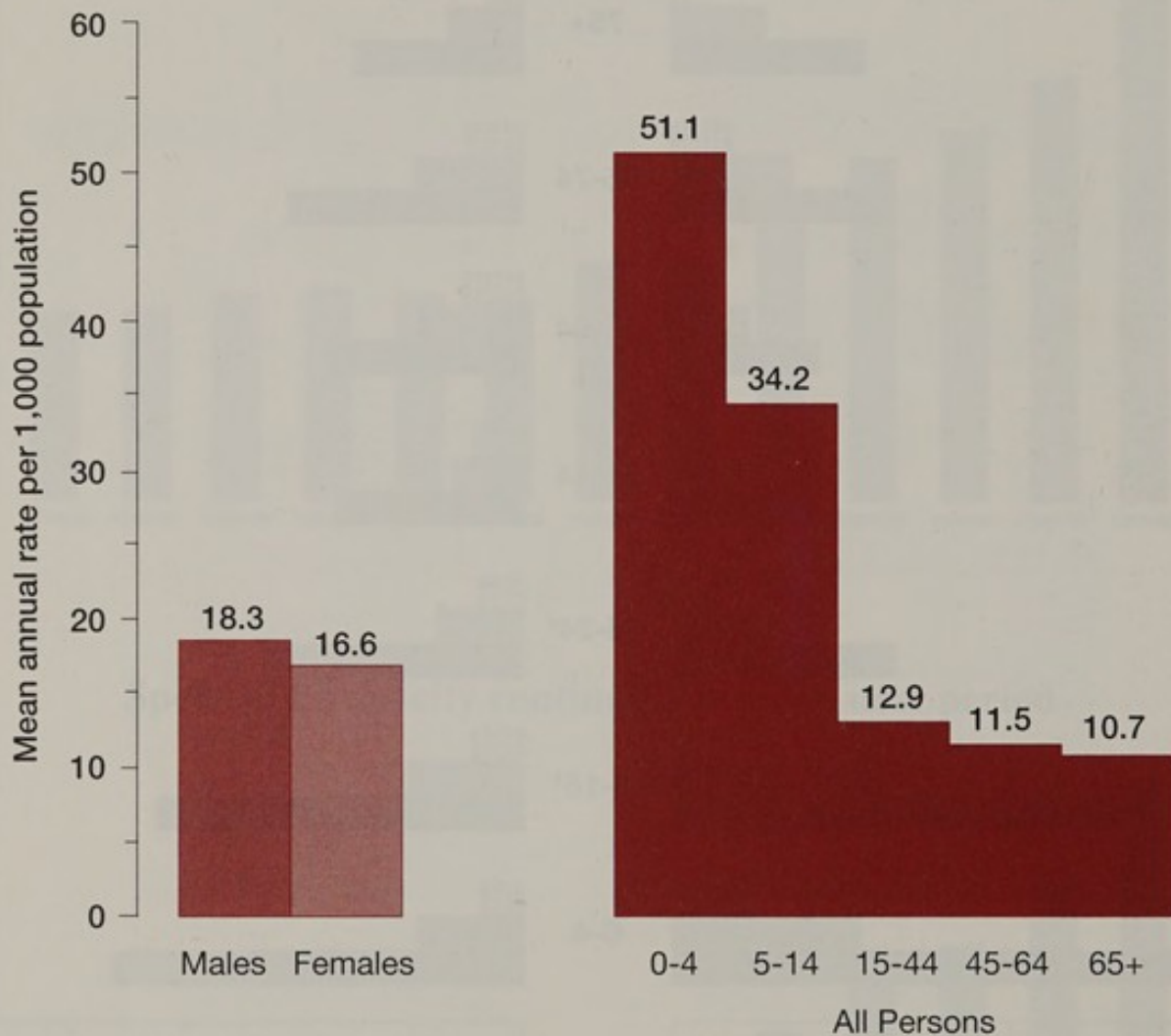
* For 1971/2 and 1981/2, age groups are 5-14 and 15-24.

Source: OPCS Morbidity Statistics from General Practice (1991/92 report in press)

Figure 5

Asthma Incidence Reported by GPs*

by sex and age England and Wales 1985-1992



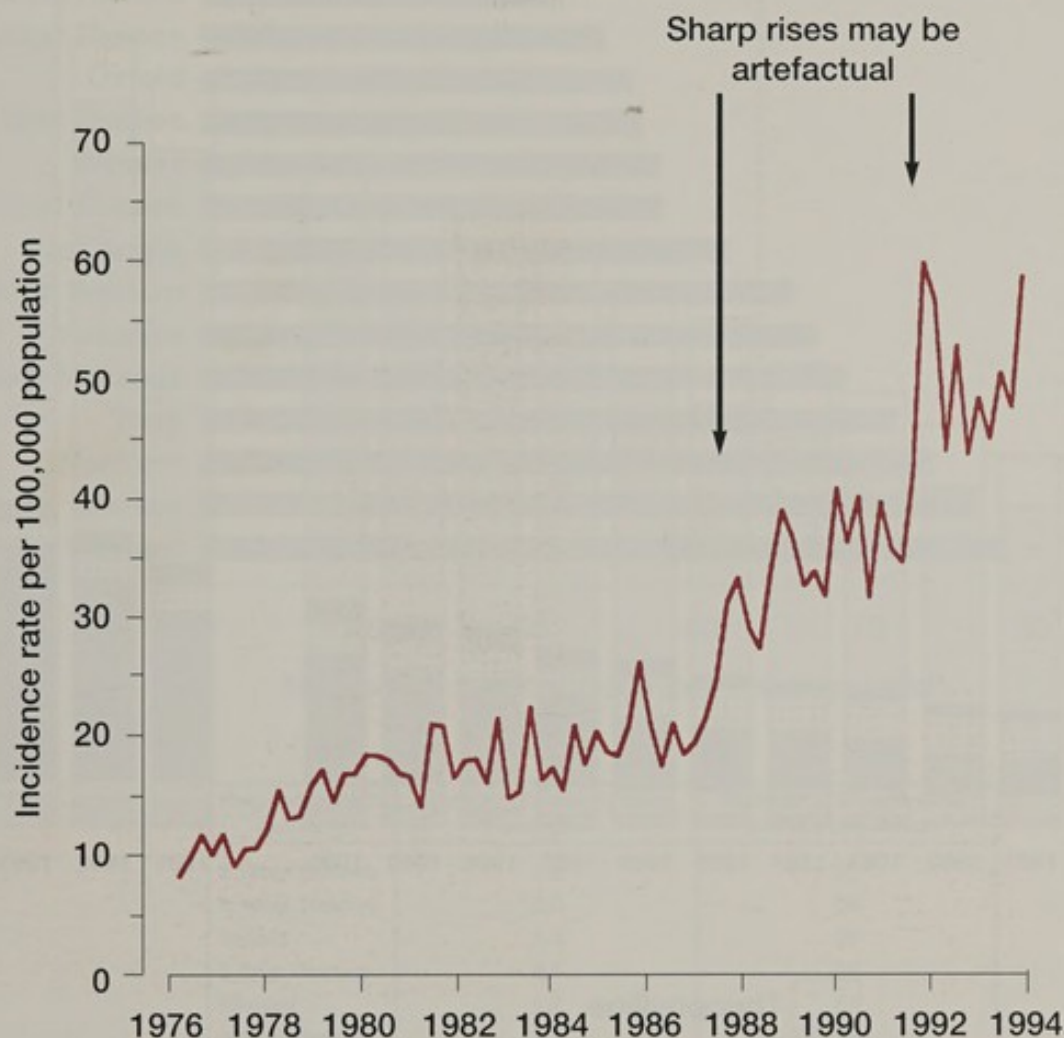
* Episodes of asthma reported by GP practices in the Weekly Returns Service.
Total number between 1985 and 1992 = 55,010.

Source: Weekly Returns Service of the Royal College of General Practitioners

Trends in Asthma Reported by GPs*

Mean weekly incidence in 12 week periods

All persons all ages England and Wales 1976-1993

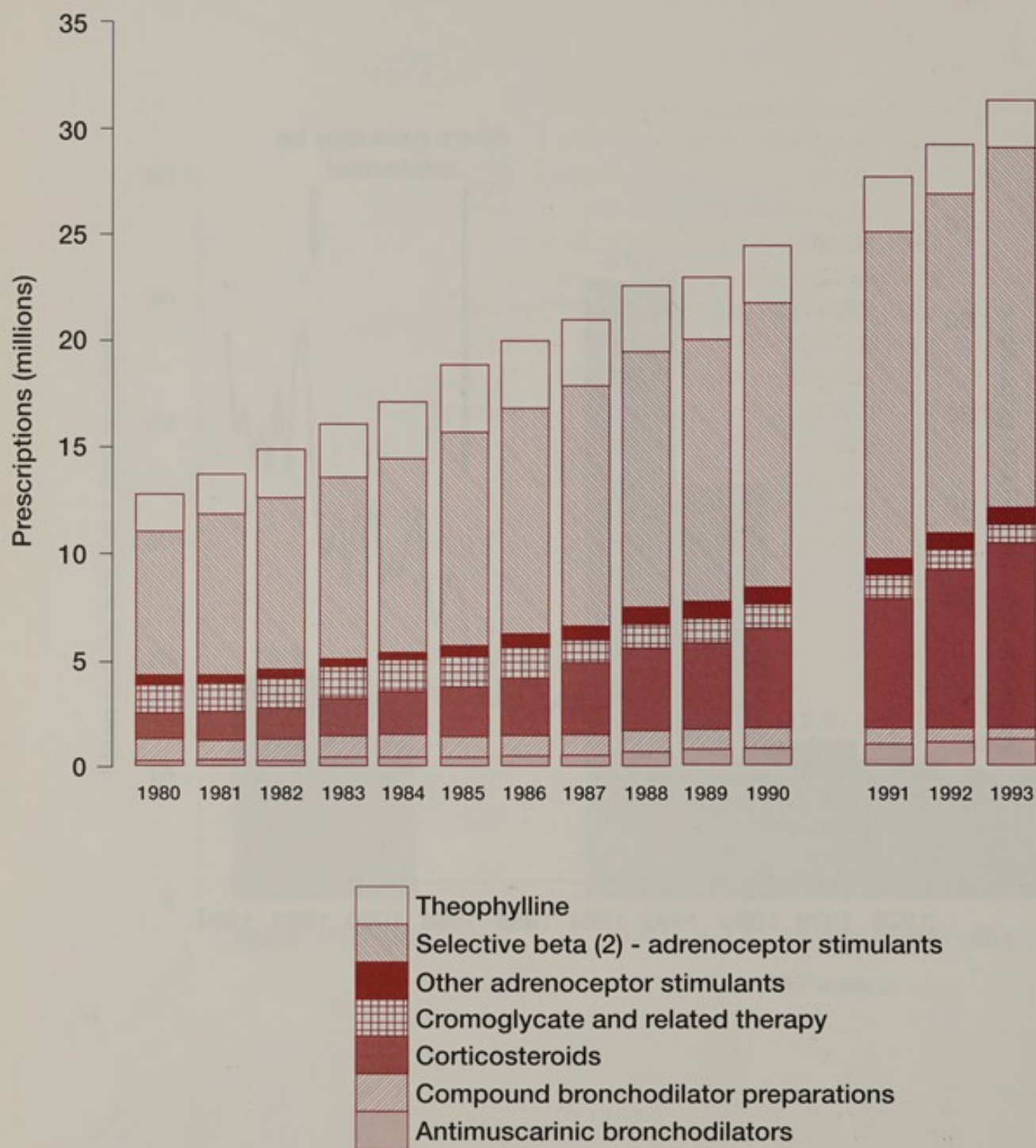


* Episodes of asthma reported by GP practices in the Weekly Returns Service.

Source: Weekly Returns Service of the Royal College of General Practitioners

Figure 7

Number of Prescriptions[#] for Asthma Preparations England 1980-1993*



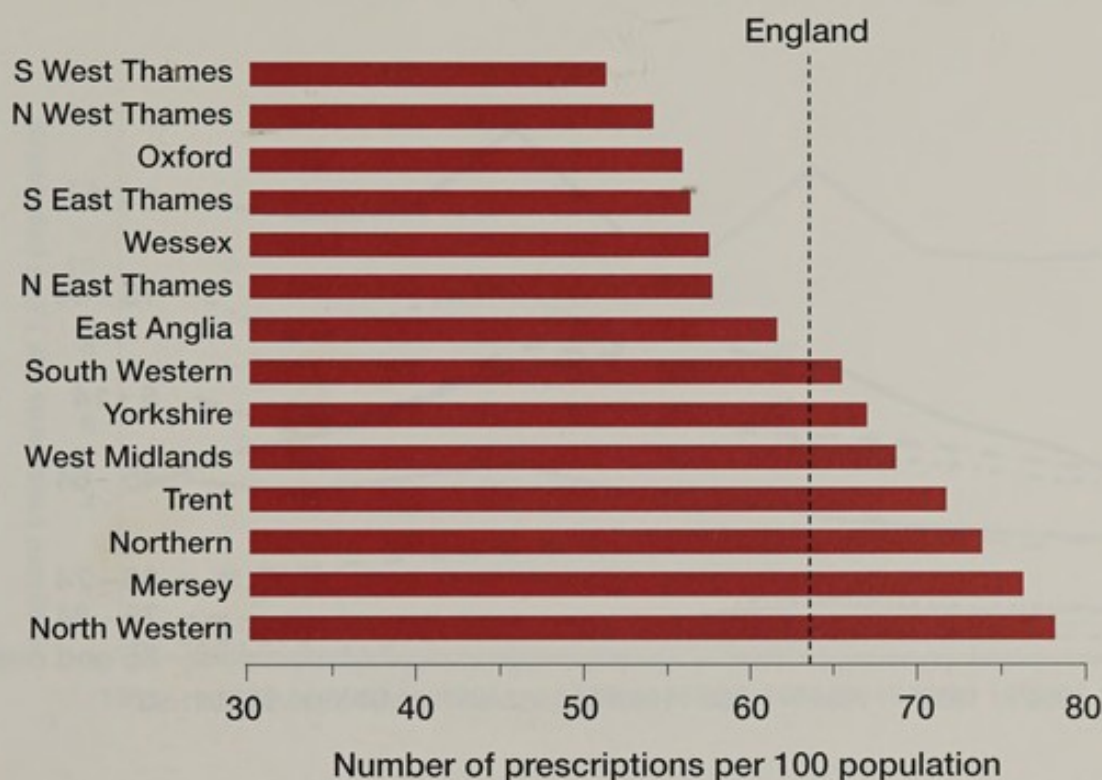
Based on the British National Formulary (BNF), Sections 3.1-3.3, September 1992.

* 1980 to 1990 data are based on **fees** only and cover prescriptions dispensed by community pharmacists and appliance contractors only.

1991 to 1993 data are based on **items** and cover all prescriptions dispensed by community pharmacists and appliance contractors, dispensing doctors, and personal administration.

Source: Prescription Pricing Authority (Unpublished data), analysis by DH Statistics Division 1E

Number of Prescriptions[#] for Asthma Preparations by Regional Health Authority England 1993



Regional Health Authority	Number of Prescriptions (millions)	Number of Prescriptions per 100 population*
S West Thames	1.6	51
N West Thames	2.0	54
Oxford	1.5	56
S East Thames	2.1	56
Wessex	1.7	57
N East Thames	2.2	58
East Anglia	1.3	62
South Western	2.2	65
Yorkshire	2.5	67
West Midlands	3.6	69
Trent	3.4	72
Northern	2.3	74
Mersey	1.8	76
North Western	3.1	78
England	31.2	64

Based on the British National Formulary (BNF), Sections 3.1-3.3, September 1992.

These data are based on **items** and cover all prescriptions dispensed by community pharmacists and appliance contractors, dispensing doctors, and personal administration.

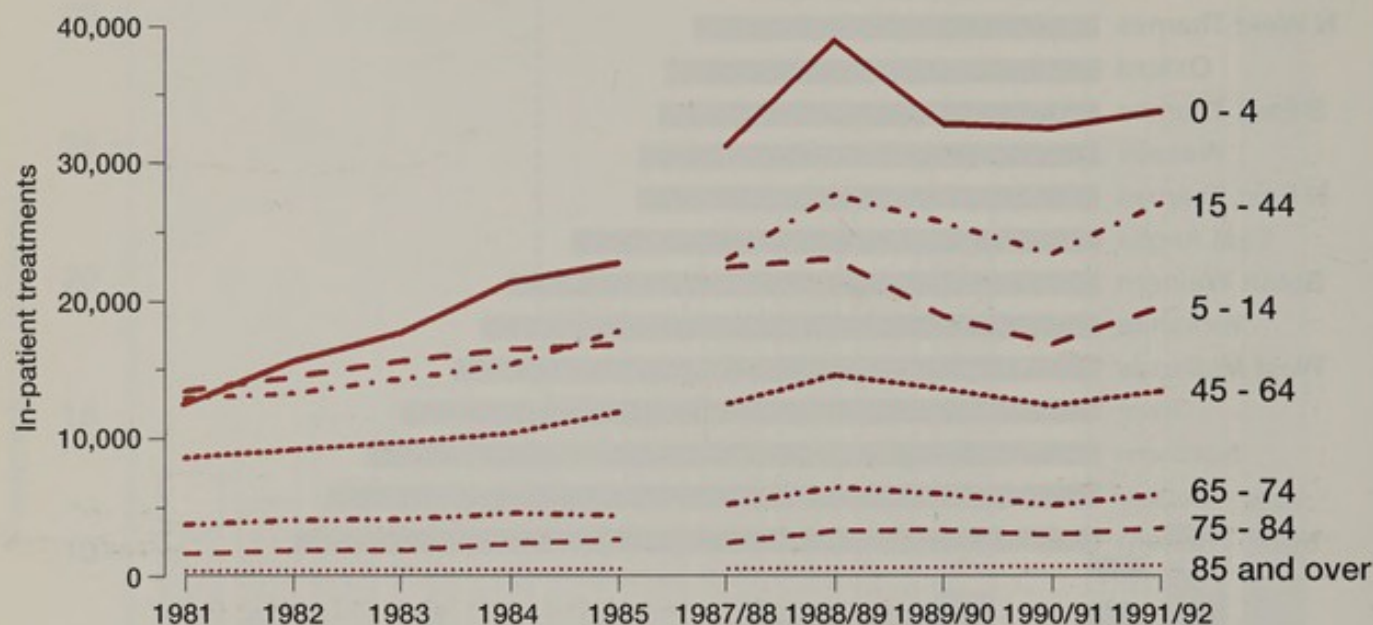
* The figures are not age adjusted.

Source: Prescription Pricing Authority (Unpublished data), analysis by DH Statistics Division 1E

Figure 9

Estimated Hospital In-patient Treatments^{**} with a main Diagnosis of Asthma

by age group England 1981-1985, 1987/88-1991/92



Numbers in thousands

Age Group	Discharges and Deaths*						Finished Consultant Episodes#					
	1981	1982	1983	1984	1985	Annual Average % change 1981-85	1987/88	1988/89	1989/90	1990/91	1991/92	Annual Average % change 1987/88-91/92
Asthma												
0-4	12.4	15.5	17.6	21.3	22.7	16.2	31.1	38.8	32.7	32.4	33.6	1.9
5-14	13.4	14.4	15.6	16.4	16.7	5.7	22.4	23.0	18.8	16.7	19.4	-3.5
15-44	12.9	13.2	14.2	15.2	17.7	8.3	22.9	27.6	25.6	23.3	26.9	4.2
45-64	8.5	9.1	9.7	10.3	11.8	8.4	12.4	14.5	13.5	12.3	13.3	1.8
65-74	3.6	4.0	4.0	4.5	4.3	4.4	5.1	6.3	5.8	5.1	5.8	3.2
75-84	1.6	1.9	1.9	2.3	2.6	11.9	2.3	3.2	3.3	2.9	3.4	9.9
85+	0.2	0.2	0.2	0.4	0.3	11.5	0.4	0.6	0.5	0.6	0.7	14.5
All ages	52.8	58.3	63.1	70.4	76.1	9.6	96.6	113.9	100.2	93.3	103.2	1.7
All Diagnoses†												
All ages	4,487.6	4,476.8	4,647.2	4,812.9	4,423.4	2.4	7,489.6	7,573.3	7,842.3	7,945.7	8,420.2	3.0

* For 1981-85 numbers of in-patient discharges and deaths from the Hospital In-patient Enquiry (HIPE), based on a 10% sample.

For 1987/88 to 1991/92 numbers of finished consultant episodes (ordinary admissions and day cases) from the Hospital Episode Statistics (HES). Data are estimates grossed up for missing records and diagnoses.

† The data for 1981-1985 are for All Causes.

Source: DH Hospital In-patient Enquiry (HIPE) and Hospital Episode Statistics (HES), analysis by DH Statistics Division 2A and Prof. Balarajan

Figure 10

Hospital In-patient Treatment Rates*#

with a main Diagnosis of Asthma

by age group England 1981-1985, 1987/88-1991/92



Rates per 1,000 population

Discharges and Deaths*							Finished Consultant Episodes#					
Age Group	1981	1982	1983	1984	1985	Annual Average % change 1981-85	1987/88	1988/89	1989/90	1990/91	1991/92	Annual Average % change 1987/88-91/92
Asthma												
0-4	4.4	5.4	6.0	7.2	7.6	14.8	10.2	12.5	10.4	10.2	10.4	0.4
5-14	2.0	2.2	2.5	2.7	2.8	8.6	3.9	4.0	3.3	2.9	3.3	-3.9
15-44	0.7	0.7	0.7	0.7	0.9	7.2	1.1	1.3	1.2	1.1	1.3	4.2
45-64	0.8	0.9	0.9	1.0	1.1	8.5	1.2	1.4	1.3	1.2	1.3	1.4
65-74	0.8	0.9	1.0	1.1	1.0	5.7	1.2	1.5	1.4	1.2	1.4	3.1
75-84	0.7	0.8	0.8	1.0	1.0	9.3	0.9	1.2	1.3	1.1	1.3	9.1
85+	0.4	0.5	0.3	0.6	0.6	8.0	0.6	0.9	0.7	0.8	0.9	9.8
All ages	1.1	1.2	1.3	1.5	1.6	9.4	2.0	2.4	2.1	1.9	2.1	1.3
All Diagnoses†												
All ages	95.8	95.7	99.8	102.5	104.5	2.2	158.0	159.3	164.4	166.1	175.2	2.6

* For 1981-85 numbers of in-patient discharges and deaths from the Hospital In-patient Enquiry (HIPE), based on a 10% sample.

For 1987/88 to 1991/92 numbers of finished consultant episodes (ordinary admissions and day cases) from the Hospital Episode Statistics (HES). Data are estimates grossed up for missing records and diagnoses.

† The data for 1981-1985 are for All Causes.

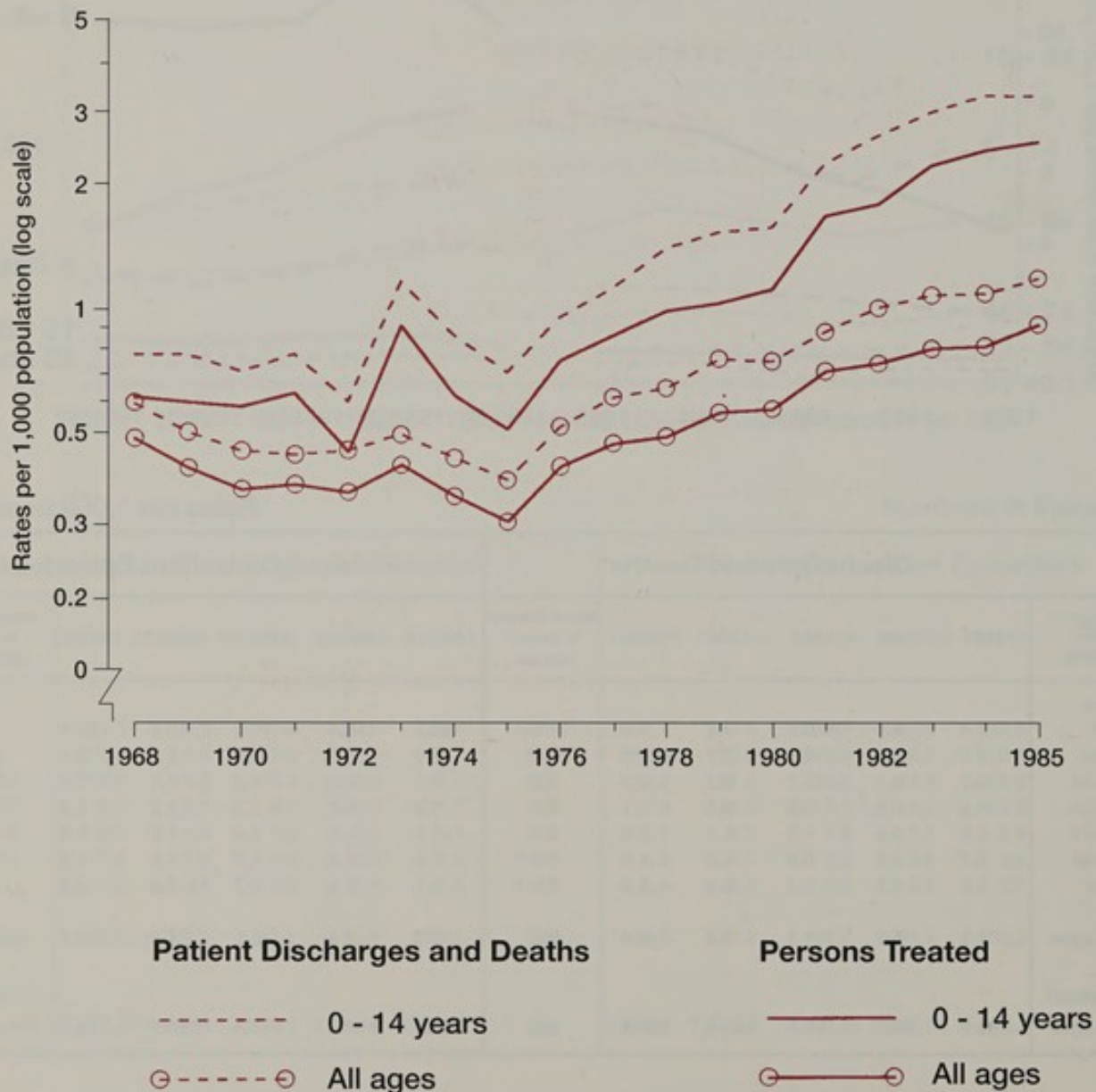
Source: DH Hospital In-patient Enquiry (HIPE) and Hospital Episode Statistics (HES), analysis by DH Statistics Division 2A and Prof. Balarajan

Figure 11

Hospital In-patient Treatments with a main Diagnosis of Asthma

Comparison of discharges and deaths with persons treated

Persons, all ages and 0-14 years Oxfordshire and West Berkshire* 1968-1985



* Persons resident and treated in Oxfordshire and West Berkshire.

Source: Simmons H., Goldacre M. J. Hospital discharge rates by diagnosis, 1968-85. Unit of Clinical Epidemiology, Oxford University.

Hospital In-patient Treatment Rates* with a main Diagnosis of Asthma

All persons by Regional Health Authority England 1987/88-1991/92



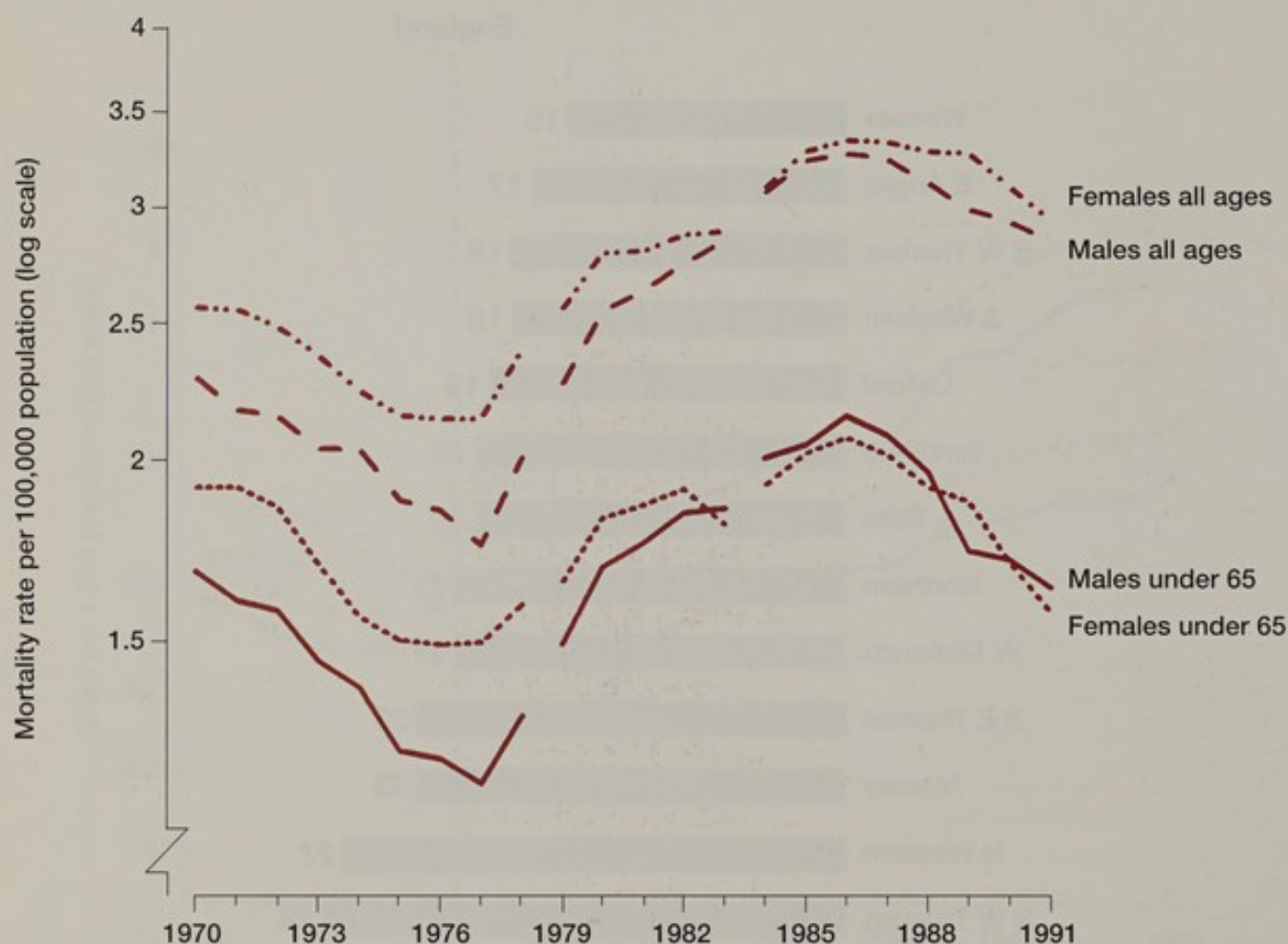
* Finished consultant episodes (ordinary admissions and day cases) from the Hospital Episode Statistics (HES). Estimates grossed up for missing records and diagnosis. Not age standardised.

Source: DH Hospital Episode Statistics (HES), analysis by DH Statistics Division 2A and Prof. Balarajan

Figure 13

Standardised Mortality Rates^{†#} for Asthma

by sex all ages and under 65 years England 1969-1992*



† Rates are calculated using a 3 year average plotted against the middle year of average.

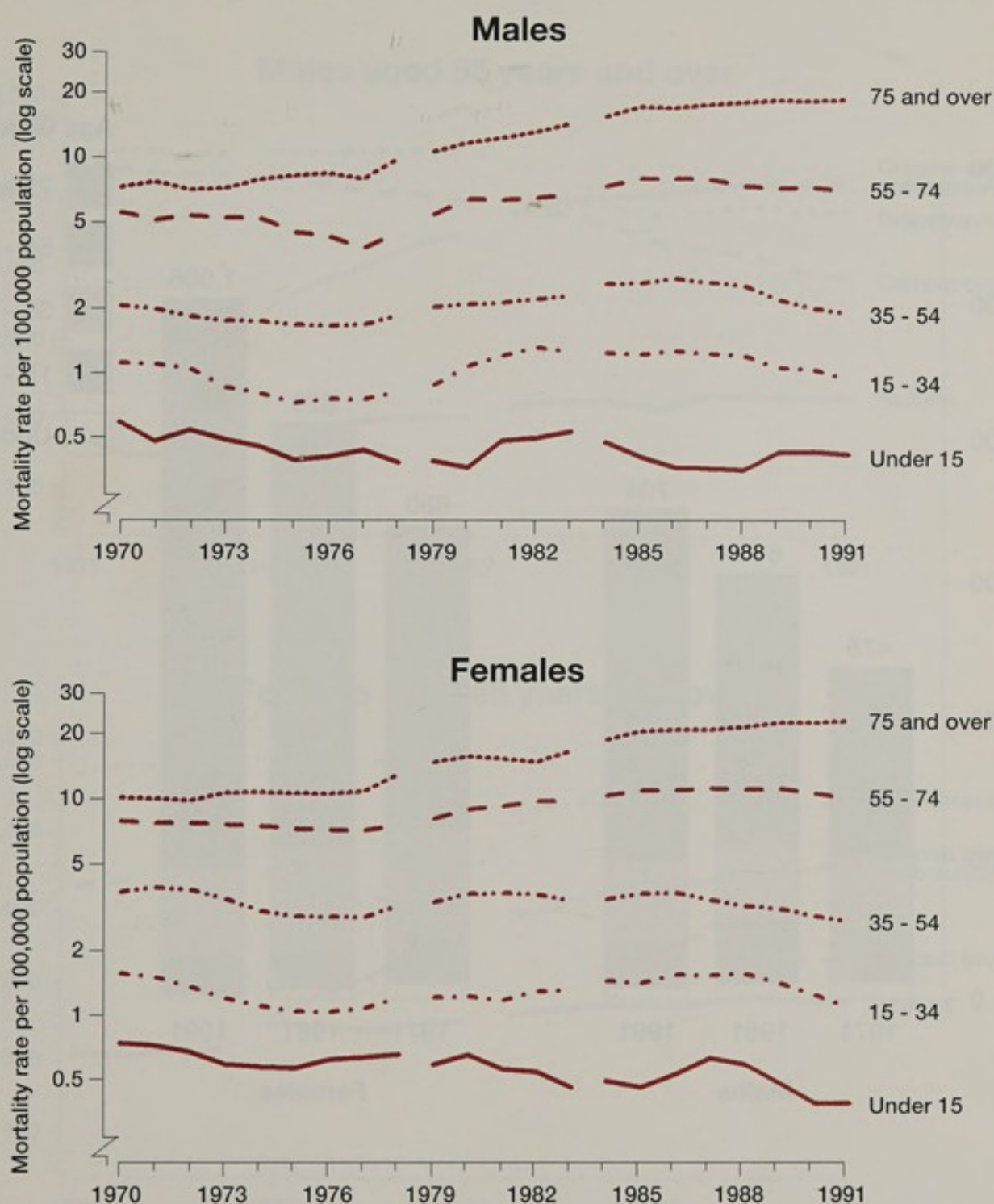
Rates are calculated using the "old" European Standard Population.

* Discontinuities in the data between the years 1978 and 1979 due to the change from ICD8 to ICD9 and between 1983 and 1984 due to a change in coding procedures may affect the comparability of data.

Source: OPCS (Unpublished data)

Standardised Mortality Rates^{†#} for Asthma

by sex and age England 1969-1992*



† Rates are calculated using a 3 year average plotted against the middle year of average.

Rates are calculated using the "old" European Standard Population.

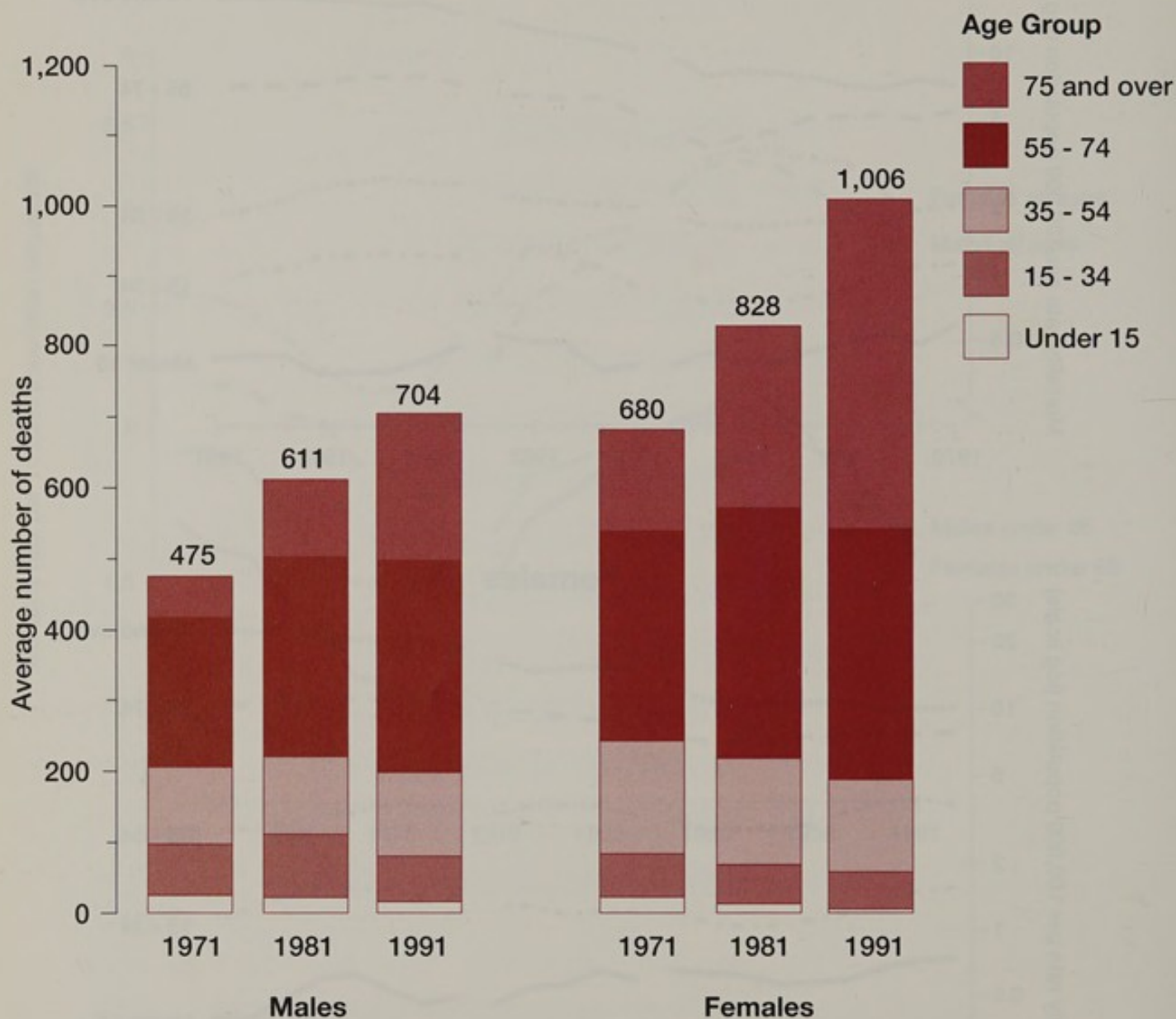
* Discontinuities in the data between the years 1978 and 1979 due to the change from ICD8 to ICD9 and between 1983 and 1984 due to a change in coding procedures may affect the comparability of data.

Source: OPCS (Unpublished data)

Figure 15

Distribution of Deaths† from Asthma

by sex and age group England 1971, 1981, 1991*



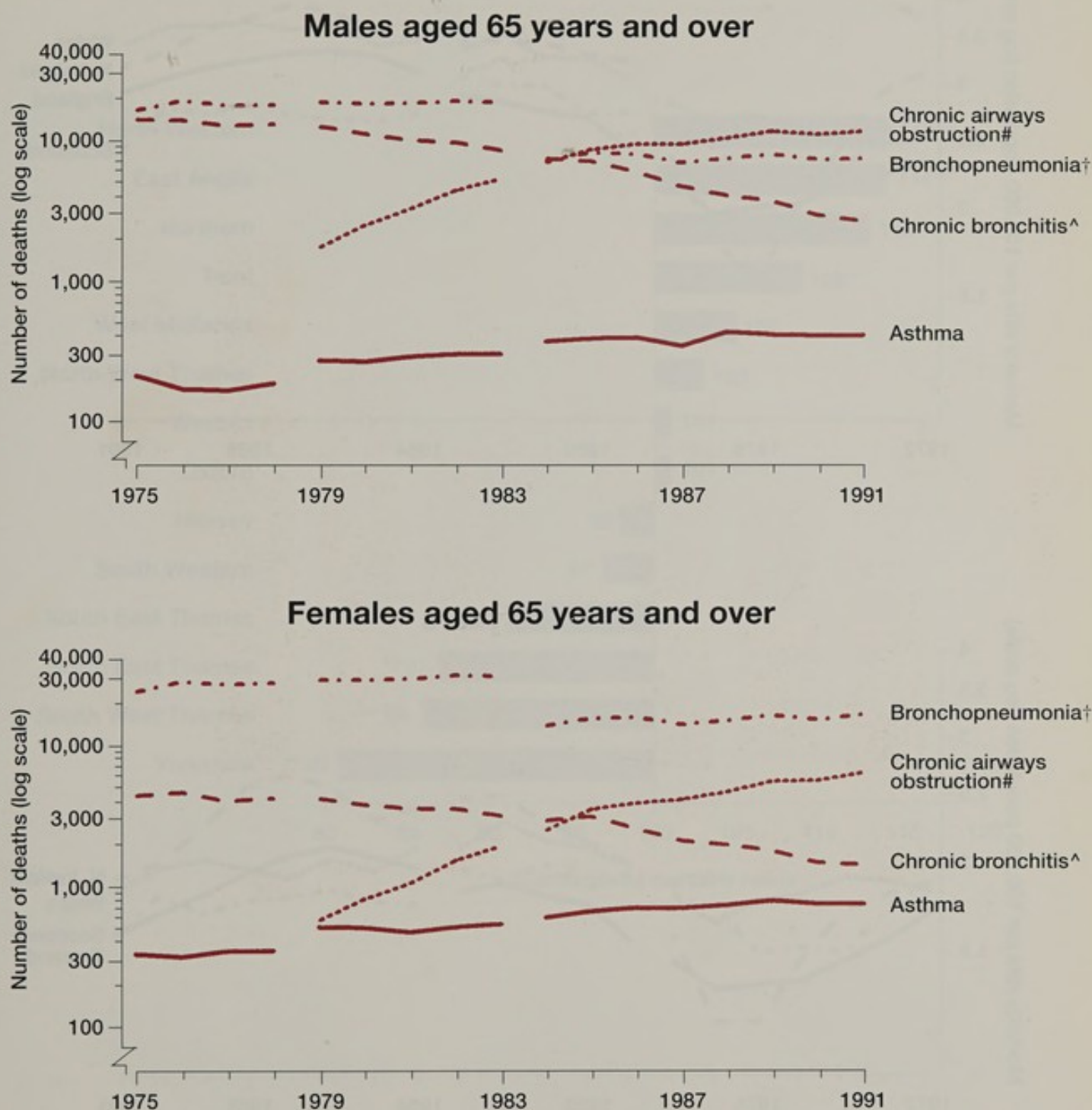
† Data are calculated using a 3 year average plotted against the middle year of average.

* Discontinuities in the data between the years 1978 and 1979 due to the change from ICD8 to ICD9 and between 1983 and 1984 due to a change in coding procedures may affect the comparability of data.

Source: OPCS (Unpublished data)

Trends in Deaths from Selected Respiratory Diseases

by sex, age 65 years and over England and Wales 1975-1991*



* Discontinuities in the data between the years 1978 and 1979 due to the change from ICD8 to ICD9 and between 1983 and 1984 due to a change in coding procedures may affect the comparability of data.

Chronic airways obstruction, not elsewhere classified (ICD 496).

† Bronchopneumonia, organism unspecified (ICD 485).

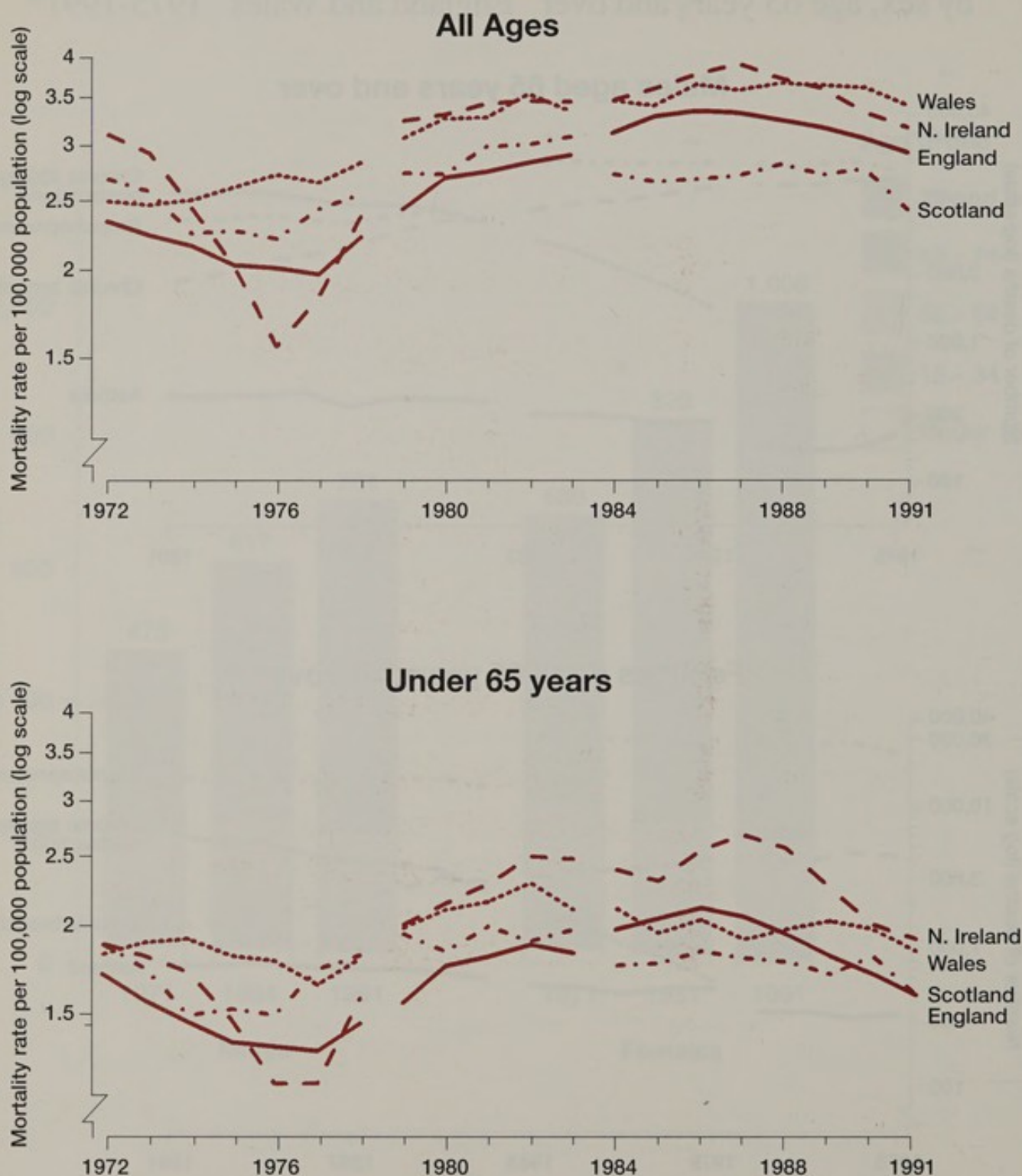
^ Chronic bronchitis (ICD 491).

Source: OPCS Mortality Statistics: cause

Figure 17

Standardised Mortality Rates^{†#} for Asthma

Persons United Kingdom by country 1971-1992*



[†] Rates are calculated using a 3 year average plotted against the middle year of average.

[#] Rates are calculated using the "old" European Standard Population.

* Discontinuities in the data between the years 1978 and 1979 due to the change from ICD8 to ICD9 and between 1983 and 1984 due to a change in coding procedures may affect the comparability of data.

Source: OPCS (Unpublished data), Registrar General N. Ireland, Registrar General Scotland and OPCS Mortality Statistics: area

Standardised Mortality Ratios for Asthma

All persons[†] by Regional Health Authority England 1988-1992

(England = 100)



[†] Data exclude deaths in the first year of life.

* = significant at the 5% level.

** = significant at the 1% level.

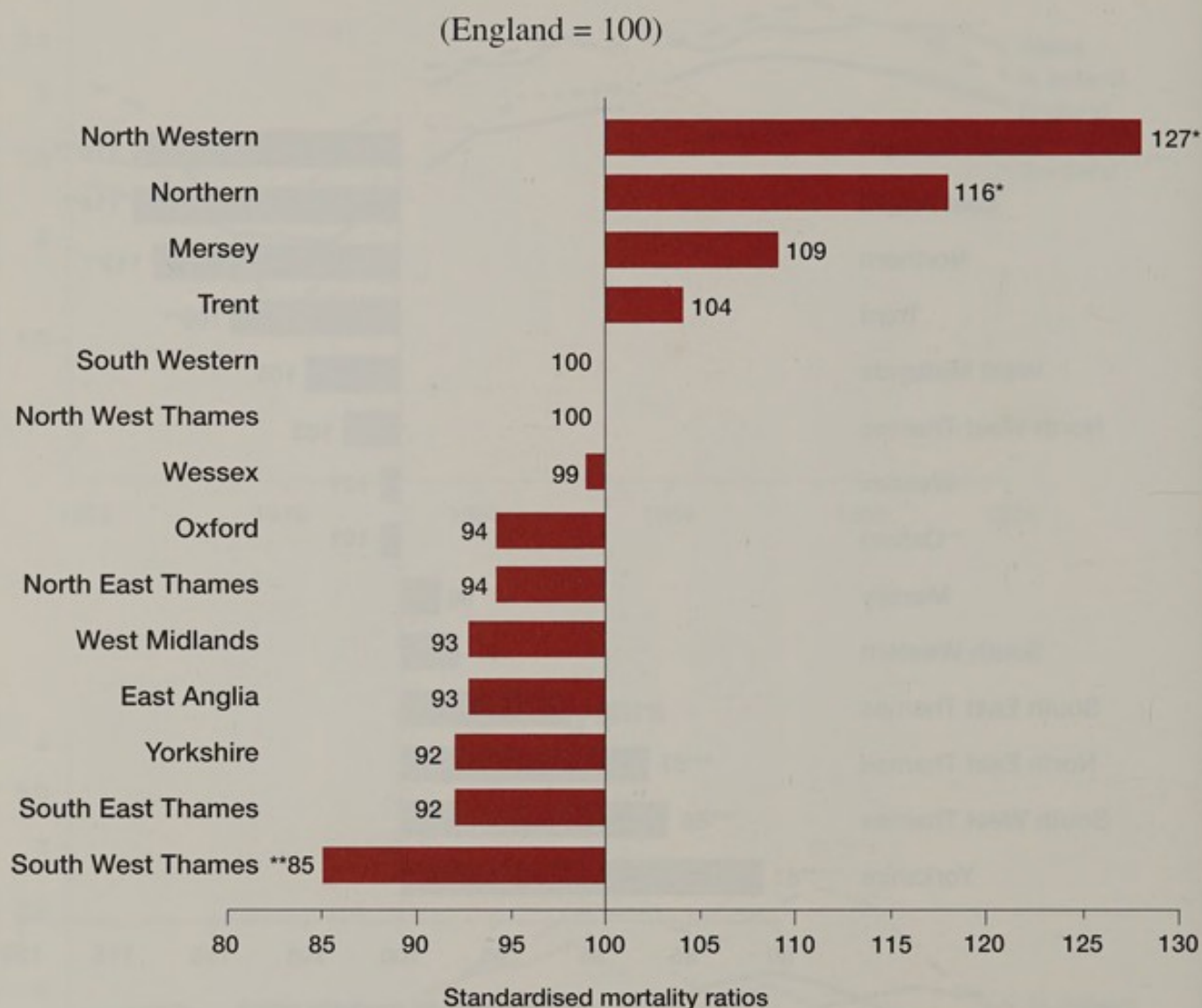
*** = significant at the 0.1% level.

Source: OPCS (Unpublished data), analysis by DH Statistics Division 2A

Figure 19

Standardised Mortality Ratios for Asthma

All persons under 65 years[†] by Regional Health Authority
England 1988-1992



[†] Data exclude deaths in the first year of life.

* = significant at the 5% level.

** = significant at the 1% level.

Source: OPCS (Unpublished data), analysis by DH Statistics Division 2A

Standardised Mortality Ratios for Asthma

All persons by District Health Authority England 1988-1992

(England = 100)

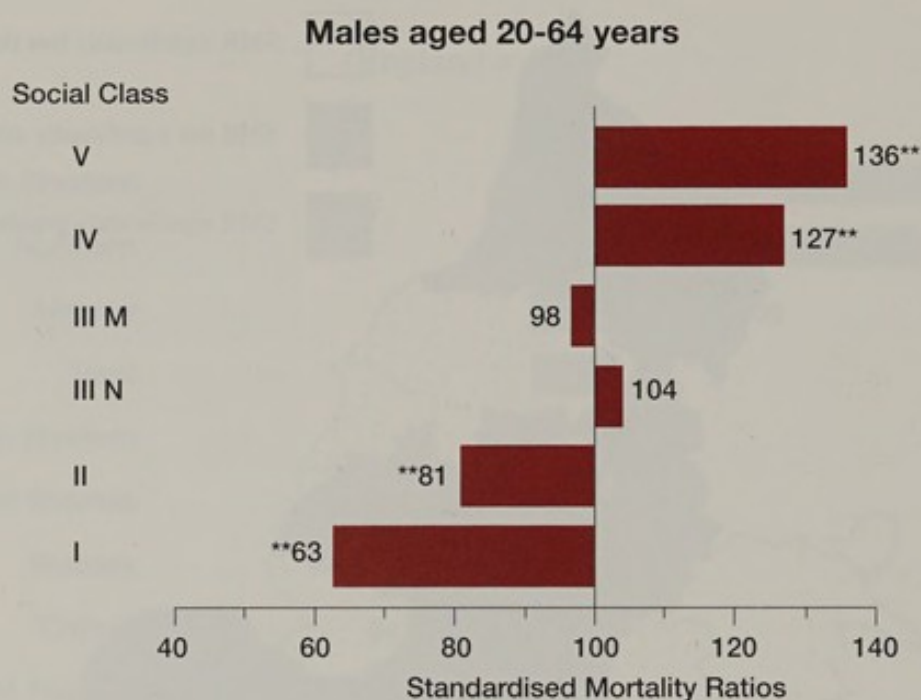


Source: OPCS (Unpublished data), analysis by DH Statistics Division 2A. Graphics by the Institute of Public Health, University of Surrey.

Figure 21

Standardised Mortality Ratios for Asthma

by sex and social class[†] England and Wales 1979-80, 1982-83



[†] Social class as defined by occupation. See glossary for description of categories.

[#] Based on own or husband's occupation.

** = significant at the 1% level.

Source: OPCS Occupational Mortality, Decennial Supplement No. 6

TABLES

Prescriptions for Asthma Preparations*

ENGLAND	1980-1993#														MILLIONS	
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993		
BNF SECTION																
ANTIMUSCARINIC BRONCHODILATORS	0.16	0.19	0.25	0.33	0.37	0.43	0.50	0.55	0.66	0.71	0.86	1.01	1.19	1.34		
COMPOUND BRONCHODILATOR PREPARATIONS	1.07	0.91	0.81	0.83	0.88	0.70	0.65	0.66	0.67	0.70	0.71	0.62	0.55	0.48		
CORTICOSTEROIDS	1.13	1.40	1.56	1.88	2.13	2.49	2.92	3.43	4.03	4.39	5.04	6.27	7.41	8.53		
CROMOGLYCATE AND RELATED THERAPY	1.41	1.41	1.51	1.51	1.53	1.48	1.43	1.30	1.21	1.08	1.00	0.98	0.92	0.94		
OTHER ADRENOCEPTOR STIMULANTS	0.56	0.50	0.46	0.40	0.37	0.50	0.63	0.57	0.64	0.59	0.61	0.67	0.62	0.64		
SELECTIVE BETA (2) - ADRENOCEPTOR STIMULANTS	6.68	7.39	7.95	8.51	9.08	10.13	10.74	11.26	12.23	12.53	13.45	15.46	16.16	17.13		
THEOPHYLLINE	1.68	1.97	2.33	2.67	2.85	3.13	3.19	3.22	3.20	2.96	2.80	2.63	2.41	2.19		
TOTAL	12.71	13.77	14.87	16.12	17.21	18.85	20.05	20.99	22.64	22.96	24.46	27.64	29.26	31.25		

* Based on the British National Formulary (BNF), Sections 3.1- 3.3, September 1992.

1980 to 1990 data are based on fees and cover prescriptions dispensed by community pharmacists and appliance contractors only.

1991 to 1993 data are based on items and cover all prescriptions dispensed by community pharmacists and appliance contractors, dispensing doctors, and personal administration.

Source: Prescription Pricing Authority (Unpublished data), analysis by DH Statistics Division 1E

Table 2a

Number of Deaths from Asthma (ICD 493)

MALES YEAR	ENGLAND												1969-1992*	
	AGE GROUP												TOTAL	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES	
1969	2	12	31	34	32	49	70	138	141	43	6	368	558	
1970	1	3	19	33	33	40	78	105	109	50	6	312	477	
1971	0	7	22	41	36	41	60	109	100	40	8	316	464	
1972	0	6	23	33	32	39	68	123	104	45	11	324	484	
1973	2	9	22	34	25	29	66	113	136	39	5	300	480	
1974	0	7	13	18	23	34	56	88	109	42	9	239	399	
1975	1	6	15	26	30	39	66	100	125	64	12	283	484	
1976	0	8	14	22	24	31	51	67	101	47	7	217	372	
1977	1	6	14	22	27	38	44	75	96	51	9	227	383	
1978	0	8	17	22	35	51	54	64	102	59	12	251	424	
1979	0	2	12	30	30	40	67	112	149	85	18	293	545	
1980	0	4	18	32	32	31	79	125	165	77	10	321	573	
1981	0	3	19	53	47	42	72	138	157	91	16	374	638	
1982	1	4	27	43	44	33	79	107	155	110	21	338	624	
1983	0	3	21	44	43	33	91	143	157	107	13	378	655	
1984	0	5	20	51	38	47	79	147	185	141	18	387	731	
1985	1	8	11	42	44	46	118	152	185	147	28	422	782	
1986	0	3	9	46	39	55	77	178	206	125	39	407	777	
1987	0	5	12	52	47	47	103	169	154	132	30	435	751	
1988	1	7	11	47	35	53	98	134	196	172	38	386	792	
1989	0	5	6	35	43	49	74	122	179	168	40	334	721	
1990	3	10	14	28	39	32	62	112	200	138	46	300	684	
1991	1	4	15	37	39	44	78	158	179	167	48	376	770	
1992	1	2	7	24	33	37	69	116	150	162	58	289	659	

* Discontinuities in the data between the years 1978 and 1979 due to the change in coding from ICD8 to ICD9 and between 1983 and 1984 due to change in coding procedures may affect the comparability of data over time.

Source: OPCS (Unpublished data)

Number of Deaths from Asthma (ICD 493)

FEMALES YEAR	ENGLAND AGE GROUP											1969-1992*	
	AGE GROUP											TOTAL	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
1969	1	11	7	36	28	43	98	167	170	102	22	391	685
1970	0	9	15	29	33	57	90	138	184	93	34	371	682
1971	2	16	10	26	36	55	107	155	157	83	23	407	670
1972	0	8	9	31	24	56	109	146	177	108	20	383	688
1973	0	9	10	23	21	52	84	135	189	108	23	334	654
1974	0	11	8	27	18	33	86	125	168	114	31	308	621
1975	0	9	5	22	21	36	71	130	171	111	27	294	603
1976	0	7	10	17	20	27	82	134	155	106	25	297	583
1977	1	7	16	20	26	31	79	120	173	111	38	300	622
1978	0	4	12	26	26	30	72	130	164	122	32	300	618
1979	0	6	12	29	27	51	99	117	246	174	64	341	825
1980	1	6	9	26	23	37	87	140	222	192	56	329	799
1981	0	4	18	34	22	45	95	185	223	179	34	403	839
1982	0	2	7	20	28	50	102	158	233	185	58	367	843
1983	0	4	11	40	27	32	86	165	254	195	49	365	863
1984	0	4	9	31	26	30	82	169	250	238	85	351	924
1985	1	2	8	47	25	56	105	199	247	257	110	443	1057
1986	0	1	11	39	24	58	89	205	290	245	111	427	1073
1987	1	5	12	40	37	39	82	155	263	276	99	371	1009
1988	0	3	16	40	31	45	88	183	284	293	104	406	1087
1989	0	1	7	29	36	33	86	166	303	290	129	358	1080
1990	0	2	7	30	25	43	72	167	246	314	132	346	7038
1991	0	3	9	24	22	43	66	137	262	263	155	304	984
1992	0	7	1	20	21	32	68	132	260	302	153	281	996

*Discontinuities in the data between the years 1978 and 1979 due to the change in coding from ICD8 to ICD9 and between 1983 and 1984 due to change in coding procedures may affect the comparability of data over time.

Source: OPCS (Unpublished data)

Table 2c

Number of Deaths from Asthma (ICD 493)

YEAR	ALL PERSONS	ENGLAND										1969-1992*	
		AGE GROUP										TOTAL	
		Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65
1969	3	23	38	70	60	92	168	305	311	145	28	759	1243
1970	1	12	34	62	66	97	168	243	293	143	40	683	1159
1971	2	23	32	67	72	96	167	264	257	123	31	723	1134
1972	0	14	32	64	56	95	177	269	281	153	31	707	1172
1973	2	18	32	57	46	81	150	248	325	147	28	634	1134
1974	0	18	21	45	41	67	142	213	277	156	40	547	1020
1975	1	15	20	48	51	75	137	230	296	175	39	577	1087
1976	0	15	24	39	44	58	133	201	256	153	32	514	955
1977	2	13	30	42	53	69	123	195	269	162	47	527	1005
1978	0	12	29	48	61	81	126	194	266	181	44	551	1042
1979	0	8	24	59	57	91	166	229	395	259	82	634	1370
1980	1	10	27	58	55	68	166	265	387	269	66	650	1372
1981	0	7	37	87	69	87	167	323	380	270	50	777	1477
1982	1	6	34	63	72	83	181	265	388	295	79	705	1467
1983	0	7	32	84	70	65	177	308	411	302	62	743	1518
1984	0	9	29	82	64	77	161	316	435	379	103	738	1655
1985	2	10	19	89	69	102	223	351	432	404	138	865	1839
1986	0	4	20	85	63	113	166	383	496	370	150	834	1850
1987	1	10	24	92	84	86	185	324	417	408	129	806	1760
1988	1	10	27	87	66	98	186	317	480	465	142	792	1879
1989	0	6	13	64	79	82	160	288	482	458	169	692	1801
1990	3	12	21	58	64	75	134	279	446	452	178	646	1722
1991	1	7	24	61	61	87	144	295	441	430	203	680	1754
1992	1	9	8	44	54	69	137	248	410	464	211	570	1655

*Discontinuities in the data between the years 1978 and 1979 due to the change in coding from ICD8 to ICD9 and between 1983 and 1984 due to change in coding procedures may affect the comparability of data over time.

Source: OPCS (Unpublished data)

Mortality Rates per 100,000 Population for Asthma (ICD 493)

MALES YEAR	ENGLAND											1969-1992*	
	AGE GROUP											AGE STANDARDISED RATES #	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
1969	0.5	0.8	0.9	1.0	1.1	1.8	2.5	5.2	8.9	7.2	6.2	1.86	2.55
1970	0.3	0.2	0.5	1.0	1.1	1.5	2.8	4.0	6.7	8.3	6.1	1.59	2.20
1971	0.0	0.5	0.6	1.2	1.2	1.5	2.1	4.2	6.0	6.7	7.5	1.59	2.11
1972	0.0	0.4	0.6	1.0	1.0	1.4	2.4	4.8	6.1	7.4	10.2	1.63	2.20
1973	0.6	0.6	0.6	1.0	0.8	1.1	2.3	4.5	7.7	6.4	4.6	1.51	2.13
1974	0.0	0.5	0.3	0.5	0.7	1.2	1.9	3.6	6.1	6.8	8.2	1.22	1.80
1975	0.3	0.4	0.4	0.8	0.9	1.4	2.3	4.0	6.8	10.1	10.8	1.45	2.18
1976	0.0	0.6	0.4	0.6	0.7	1.2	1.8	2.7	5.5	7.2	6.2	1.11	1.65
1977	0.4	0.5	0.4	0.6	0.8	1.4	1.6	3.0	5.1	7.6	8.0	1.17	1.71
1978	0.0	0.7	0.5	0.6	1.0	1.9	2.0	2.6	5.4	8.5	10.5	1.31	1.90
1979	0.0	0.2	0.3	0.8	0.9	1.4	2.5	4.5	7.8	11.8	15.5	1.52	2.41
1980	0.0	0.4	0.5	0.9	0.9	1.1	3.0	5.0	8.6	10.3	8.4	1.66	2.47
1981	0.0	0.3	0.6	1.4	1.4	1.5	2.8	5.6	8.3	11.7	13.4	1.90	2.75
1982	0.3	0.3	0.8	1.1	1.3	1.1	3.0	4.3	8.3	13.7	17.1	1.72	2.68
1983	0.0	0.2	0.7	1.1	1.3	1.1	3.5	5.6	8.6	12.8	10.4	1.91	2.79
1984	0.0	0.4	0.6	1.3	1.2	1.5	3.0	5.7	10.4	16.4	13.9	1.93	3.07
1985	0.3	0.7	0.4	1.1	1.3	1.4	4.5	6.0	10.2	16.7	20.7	2.18	3.34
1986	0.0	0.2	0.3	1.2	1.2	1.7	3.0	7.2	11.1	13.9	27.5	2.04	3.29
1987	0.0	0.4	0.4	1.3	1.4	1.4	4.0	6.9	8.2	14.3	19.1	2.22	3.17
1988	0.3	0.6	0.4	1.2	1.0	1.6	3.7	5.6	10.5	18.3	22.7	1.98	3.28
1989	0.0	0.4	0.2	0.9	1.2	1.5	2.8	5.1	9.5	17.6	22.4	1.69	2.92
1990	0.9	0.8	0.5	0.8	1.1	1.0	2.3	4.7	10.6	14.3	24.4	1.52	2.77
1991	0.3	0.3	0.5	1.1	1.0	1.3	2.8	6.7	9.4	17.2	24.2	1.91	3.11
1992	0.3	0.1	0.2	0.7	0.9	1.1	2.4	4.9	7.8	16.8	28.0	1.47	2.62

* Discontinuities in the data between the years 1978 and 1979 due to the change in coding from ICD8 to ICD9 and between 1983 and 1984 due to change in coding procedures may affect the comparability of data over time.

Rates are calculated using the "old" European Standard Population.

Source: OPCS (Unpublished data)

Table 3b

Mortality Rates per 100,000 Population for Asthma (ICD 493)

FEMALES		ENGLAND										1969-1992*		
YEAR		AGE GROUP										AGE STANDARDISED RATES #		
		Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
1969	0.3	0.7	0.2	1.1	1.0	1.6	3.4	5.7	7.6	8.6	8.1	1.90	2.56	
1970	0.0	0.6	0.4	0.9	1.2	2.1	3.1	4.7	8.1	7.7	12.1	1.84	2.56	
1971	0.6	1.1	0.3	0.8	1.3	2.0	3.7	5.4	6.8	6.8	7.4	2.02	2.55	
1972	0.0	0.6	0.2	1.0	0.8	2.1	3.8	5.1	7.6	8.7	6.3	1.90	2.54	
1973	0.0	0.6	0.3	0.7	0.7	2.0	2.9	4.9	8.0	8.6	7.0	1.66	2.36	
1974	0.0	0.8	0.2	0.8	0.6	1.2	2.9	4.6	7.0	9.0	9.3	1.54	2.23	
1975	0.0	0.7	0.1	0.7	0.7	1.4	2.5	4.8	7.1	8.6	7.9	1.48	2.15	
1976	0.0	0.6	0.3	0.5	0.6	1.0	2.9	4.9	6.4	8.0	7.2	1.49	2.08	
1977	0.4	0.6	0.4	0.6	0.8	1.2	2.9	4.4	7.1	8.2	10.7	1.51	2.19	
1978	0.0	0.4	0.3	0.8	0.8	1.1	2.7	4.7	6.7	8.8	8.8	1.50	2.16	
1979	0.0	0.6	0.3	0.8	0.8	1.9	3.7	4.3	10.0	12.3	17.3	1.77	2.82	
1980	0.3	0.6	0.3	0.7	0.7	1.3	3.3	5.2	9.0	13.3	14.7	1.68	2.66	
1981	0.0	0.4	0.6	0.9	0.7	1.6	3.6	6.9	9.1	12.2	8.7	2.03	2.90	
1982	0.0	0.2	0.2	0.5	0.9	1.7	3.9	5.8	9.7	12.3	14.3	1.88	2.85	
1983	0.0	0.3	0.4	1.1	0.8	1.1	3.3	6.0	10.9	12.7	11.8	1.82	2.88	
1984	0.0	0.3	0.3	0.8	0.8	1.0	3.2	6.1	11.0	15.2	19.8	1.72	2.94	
1985	0.3	0.2	0.3	1.3	0.8	1.8	4.1	7.4	10.7	16.2	24.7	2.23	3.45	
1986	0.0	0.1	0.4	1.0	0.7	1.8	3.5	7.8	12.4	15.3	24.0	2.12	3.44	
1987	0.3	0.4	0.4	1.1	1.1	1.2	3.2	6.0	11.2	17.0	20.2	1.88	3.15	
1988	0.0	0.3	0.6	1.1	0.9	1.4	3.4	7.2	12.1	17.9	20.4	2.06	3.41	
1989	0.0	0.1	0.2	0.8	1.0	1.0	3.2	6.6	13.0	17.5	24.2	1.82	3.29	
1990	0.0	0.2	0.2	0.9	0.7	1.3	2.7	6.7	10.7	18.9	24.0	1.75	3.10	
1991	0.0	0.2	0.3	0.7	0.6	1.3	2.4	5.6	11.2	15.9	27.4	1.54	2.90	
1992	0.0	0.6	0.0	0.6	0.6	1.0	2.4	5.4	11.1	18.5	26.1	1.42	2.82	

* Discontinuities in the data between the years 1978 and 1979 due to the change in coding from ICD8 to ICD9 and between 1983 and 1984 due to change in coding procedures may affect the comparability of data over time.

Rates are calculated using the "old" European Standard Population.

Source: OPCS (Unpublished data)

Mortality Rates per 100,000 Population for Asthma (ICD 493)

ALL PERSONS YEAR	ENGLAND										1969-1992*		
	AGE GROUP										AGE STANDARDISED RATES #		
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
1969	0.0	0.7	0.5	1.0	1.1	1.7	2.9	5.5	8.2	8.1	7.6	1.88	2.56
1970	0.1	0.4	0.5	0.9	1.2	1.8	3.0	4.4	7.5	7.9	10.6	1.72	2.40
1971	0.3	0.8	0.4	1.0	1.2	1.8	2.9	4.8	6.5	6.8	7.5	1.81	2.34
1972	0.0	0.5	0.4	1.0	0.9	1.8	3.1	5.0	6.9	8.3	7.3	1.77	2.38
1973	0.3	0.6	0.4	0.9	0.7	1.5	2.6	4.7	7.9	7.9	6.4	1.59	2.26
1974	0.0	0.6	0.3	0.7	0.6	1.2	2.4	4.2	6.6	8.3	9.0	1.38	2.03
1975	0.2	0.6	0.3	0.7	0.8	1.4	2.4	4.4	7.0	9.1	8.6	1.47	2.15
1976	0.0	0.6	0.3	0.6	0.7	1.1	2.4	3.8	6.0	7.8	7.0	1.31	1.88
1977	0.4	0.6	0.4	0.6	0.8	1.3	2.2	3.7	6.3	8.0	10.0	1.35	1.97
1978	0.0	0.5	0.4	0.7	0.9	1.5	2.3	3.7	6.1	8.7	9.2	1.41	2.04
1979	0.0	0.4	0.3	0.8	0.8	1.7	3.1	4.4	9.1	12.1	16.9	1.64	2.63
1980	0.2	0.5	0.4	0.8	0.8	1.2	3.2	5.1	8.8	12.3	13.2	1.67	2.60
1981	0.0	0.3	0.6	1.2	1.0	1.5	3.2	6.2	8.7	12.0	9.8	1.97	2.82
1982	0.2	0.3	0.5	0.8	1.1	1.4	3.5	5.1	9.1	12.8	15.0	1.80	2.77
1983	0.0	0.3	0.5	1.1	1.1	1.1	3.4	5.8	9.9	12.8	11.5	1.87	2.85
1984	0.0	0.4	0.5	1.1	1.0	1.2	3.1	5.9	10.7	15.6	18.4	1.83	3.02
1985	0.3	0.4	0.3	1.2	1.1	1.6	4.3	6.8	10.5	16.4	23.8	2.21	3.40
1986	0.0	0.2	0.3	1.1	0.9	1.7	3.2	7.5	11.8	14.8	24.9	2.09	3.37
1987	0.2	0.4	0.4	1.2	1.2	1.3	3.6	6.5	9.9	16.1	19.9	2.05	3.18
1988	0.2	0.4	0.5	1.2	0.9	1.5	3.6	6.4	11.4	18.1	20.9	2.02	3.34
1989	0.0	0.2	0.2	0.9	1.1	1.2	3.0	5.9	11.5	17.5	23.7	1.76	3.13
1990	0.5	0.5	0.4	0.8	0.9	1.1	2.5	5.7	10.7	17.2	24.1	1.64	2.95
1991	0.2	0.3	0.4	0.9	0.8	1.3	2.6	6.1	10.4	16.4	26.5	1.73	3.01
1992	0.2	0.3	0.1	0.7	0.7	1.1	2.4	5.2	9.6	17.9	26.6	1.45	2.74

* Discontinuities in the data between the years 1978 and 1979 due to the change in coding from ICD8 to ICD9 and between 1983 and 1984 due to change in coding procedures may affect the comparability of data over time.

Rates are calculated using the "old" European Standard Population.

Source: OPCS (Unpublished data)

Number of Deaths from Asthma (ICD 493)

Table 4

MALES RHA	REGIONAL HEALTH AUTHORITY											1988/1992 COMBINED	
	AGE GROUP											TOTAL	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
Northern	0	3	3	10	12	13	28	48	64	50	9	117	240
Yorkshire	0	1	3	10	11	13	34	49	57	39	6	121	223
Trent	0	1	3	19	16	23	48	68	101	64	13	178	356
East Anglia	0	1	0	9	6	12	13	24	58	50	18	65	191
North West Thames	1	2	5	16	26	20	27	44	64	60	17	141	282
North East Thames	0	2	4	13	11	17	16	47	58	60	23	110	251
South East Thames	1	2	3	18	15	15	32	38	64	77	16	124	281
South West Thames	0	1	3	6	12	16	11	31	35	56	14	80	185
Wessex	0	1	4	10	16	14	24	39	57	68	23	108	256
Oxford	0	0	4	13	7	15	19	31	43	36	9	89	177
South Western	1	1	3	13	12	14	25	46	67	57	24	115	263
West Midlands	2	8	3	16	19	13	40	79	93	110	31	180	414
Mersey	0	4	7	7	6	14	23	36	53	28	8	97	186
North Western	0	1	8	11	20	16	41	62	90	52	19	159	320

FEMALES RHA	REGIONAL HEALTH AUTHORITY											1988/1992 COMBINED	
	AGE GROUP											TOTAL	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
Northern	0	0	3	10	5	13	36	73	121	104	31	140	396
Yorkshire	0	1	5	7	13	21	26	44	71	98	37	117	323
Trent	0	1	3	8	12	21	35	91	180	158	71	171	580
East Anglia	0	2	2	5	7	9	17	27	60	71	56	69	256
North West Thames	0	1	5	12	10	13	19	41	81	103	48	101	333
North East Thames	0	1	3	13	13	15	30	59	76	82	34	134	326
South East Thames	0	1	3	4	11	13	29	49	92	109	59	110	370
South West Thames	0	1	5	11	9	10	20	41	64	91	56	97	308
Wessex	0	1	1	14	11	15	26	39	92	101	53	107	353
Oxford	0	3	0	9	6	10	16	33	66	68	32	77	243
South Western	0	1	2	11	12	6	20	65	94	115	60	117	386
West Midlands	0	1	4	15	10	17	37	83	132	197	64	167	560
Mersey	0	0	0	9	6	6	28	42	56	70	22	91	239
North Western	0	2	4	15	10	27	41	98	170	95	50	197	512

ALL PERSONS RHA	REGIONAL HEALTH AUTHORITY											1988/1992 COMBINED	
	AGE GROUP											TOTAL	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
Northern	0	3	6	20	17	26	64	121	185	154	40	257	636
Yorkshire	0	2	8	17	24	34	60	93	128	137	43	238	546
Trent	0	2	6	27	28	44	83	159	281	222	84	349	936
East Anglia	0	3	2	14	13	21	30	51	118	121	74	134	447
North West Thames	1	3	10	28	36	33	46	85	145	163	65	242	615
North East Thames	0	3	7	26	24	32	46	106	134	142	57	244	577
South East Thames	1	3	6	22	26	28	61	87	156	186	75	234	651
South West Thames	0	2	8	17	21	26	31	72	99	147	70	177	493
Wessex	0	2	5	24	27	29	50	78	149	169	76	215	609
Oxford	0	3	4	22	13	25	35	64	109	104	41	166	420
South Western	1	2	5	24	24	20	45	111	161	172	84	232	649
West Midlands	2	9	7	31	29	30	77	162	225	307	95	347	974
Mersey	0	4	7	16	12	20	51	78	109	98	30	188	425
North Western	0	3	12	26	30	43	82	160	260	147	69	356	832

Source: OPCS (Unpublished data), analysis by DH Statistics Division 2A

Mortality Rates per 100,000 Population for Asthma (ICD 493)

Table 5

REGIONAL HEALTH AUTHORITY												1988/1992 COMBINED	
MALES													
RHA	AGE GROUP											AGE STANDARDISED RATES*	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
Northern	0.0	0.7	0.3	0.9	1.0	1.2	3.2	5.9	10.1	17.4	17.8	1.83	3.04
Yorkshire	0.0	0.2	0.3	0.7	0.8	1.0	3.3	5.4	7.9	11.0	9.0	1.64	2.43
Trent	0.0	0.2	0.2	1.1	0.9	1.4	3.5	5.7	10.5	13.7	15.6	1.82	2.92
East Anglia	0.0	0.4	0.0	1.1	0.8	1.7	2.2	4.7	13.0	21.2	39.1	1.53	3.30
North West Thames	0.8	0.4	0.5	1.2	1.8	1.6	2.7	5.3	10.6	18.7	27.6	1.93	3.29
North East Thames	0.0	0.4	0.3	0.9	0.7	1.3	1.6	5.2	8.3	16.6	33.4	1.43	2.69
South East Thames	0.8	0.4	0.3	1.3	1.0	1.2	3.2	4.3	8.6	19.0	19.8	1.68	2.86
South West Thames	0.0	0.3	0.4	0.6	1.0	1.5	1.3	4.2	6.0	17.1	20.5	1.30	2.30
Wessex	0.0	0.2	0.4	0.8	1.3	1.3	2.8	5.1	8.8	19.5	32.0	1.71	3.04
Oxford	0.0	0.0	0.5	1.2	0.7	1.6	2.6	5.3	9.9	16.5	22.1	1.69	2.91
South Western	1.0	0.2	0.3	1.1	1.0	1.3	2.7	5.5	9.3	14.4	29.2	1.72	2.90
West Midlands	1.1	1.1	0.2	0.8	0.9	0.7	2.6	5.9	9.0	22.6	37.0	1.65	3.14
Mersey	0.0	1.2	0.9	0.8	0.7	1.7	3.3	5.9	11.5	12.7	20.7	1.97	3.15
North Western	0.0	0.2	0.6	0.7	1.3	1.2	3.6	6.3	11.7	13.8	28.5	1.96	3.26

REGIONAL HEALTH AUTHORITY												1988/1992 COMBINED	
FEMALES													
RHA	AGE GROUP											AGE STANDARDISED RATES*	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
Northern	0.0	0.0	0.3	0.9	0.4	1.2	4.1	8.5	15.4	20.3	19.4	2.16	3.80
Yorkshire	0.0	0.2	0.4	0.5	1.0	1.7	2.5	4.6	8.0	15.5	17.3	1.55	2.58
Trent	0.0	0.2	0.2	0.5	0.7	1.3	2.6	7.4	15.7	20.3	28.8	1.76	3.56
East Anglia	0.0	0.8	0.3	0.7	0.9	1.3	2.9	5.0	11.6	19.4	45.9	1.64	3.31
North West Thames	0.0	0.2	0.5	0.9	0.7	1.0	1.9	4.9	11.1	19.1	25.8	1.42	2.87
North East Thames	0.0	0.2	0.3	0.9	0.8	1.1	2.9	6.4	8.9	13.2	16.0	1.77	2.75
South East Thames	0.0	0.2	0.3	0.3	0.8	1.0	2.8	5.1	9.8	15.3	23.1	1.48	2.69
South West Thames	0.0	0.3	0.6	1.1	0.8	1.0	2.3	5.3	8.7	15.9	26.6	1.59	2.76
Wessex	0.0	0.3	0.1	1.3	1.0	1.4	2.9	4.8	11.6	17.3	26.2	1.67	3.08
Oxford	0.0	0.9	0.0	0.9	0.6	1.1	2.2	5.6	12.8	19.3	27.1	1.52	3.10
South Western	0.0	0.3	0.2	1.0	1.0	0.5	2.1	7.2	10.5	17.5	25.8	1.68	3.02
West Midlands	0.0	0.1	0.2	0.8	0.5	1.0	2.5	6.1	10.6	23.8	25.2	1.55	3.08
Mersey	0.0	0.0	0.0	1.0	0.7	0.7	4.0	6.5	9.5	17.2	16.5	1.82	2.96
North Western	0.0	0.4	0.3	1.0	0.7	2.0	3.7	9.5	17.3	13.5	22.1	2.42	3.99

REGIONAL HEALTH AUTHORITY												1988/1992 COMBINED	
ALL PERSONS													
RHA	AGE GROUP											AGE STANDARDISED RATES*	
	Under 1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85 and over	Under 65	ALL AGES
Northern	0.0	0.4	0.3	0.9	0.7	1.2	3.6	7.3	13.1	19.3	19.0	2.00	3.46
Yorkshire	0.0	0.2	0.3	0.6	0.9	1.4	2.9	5.0	8.0	13.9	15.3	1.59	2.55
Trent	0.0	0.2	0.2	0.8	0.8	1.4	3.1	6.6	13.3	17.8	25.5	1.79	3.32
East Anglia	0.0	0.6	0.2	0.9	0.9	1.5	2.6	4.9	12.3	20.1	44.0	1.59	3.31
North West Thames	0.4	0.3	0.5	1.1	1.2	1.3	2.3	5.1	10.8	18.9	26.2	1.68	3.08
North East Thames	0.0	0.3	0.3	0.9	0.8	1.2	2.2	5.8	8.6	14.5	20.2	1.60	2.66
South East Thames	0.4	0.3	0.3	0.8	0.9	1.1	3.0	4.7	9.3	16.6	22.3	1.58	2.78
South West Thames	0.0	0.3	0.5	0.8	0.9	1.2	1.8	4.8	7.5	16.3	25.1	1.44	2.55
Wessex	0.0	0.3	0.3	1.1	1.2	1.4	2.9	4.9	10.3	18.1	27.7	1.69	3.05
Oxford	0.0	0.4	0.2	1.1	0.6	1.3	2.4	5.4	11.5	18.2	25.8	1.60	3.04
South Western	0.5	0.2	0.3	1.0	1.0	0.9	2.4	6.4	10.0	16.4	26.7	1.70	2.97
West Midlands	0.5	0.6	0.2	0.8	0.7	0.8	2.5	6.0	9.9	23.3	28.2	1.60	3.09
Mersey	0.0	0.6	0.5	0.9	0.7	1.2	3.7	6.2	10.4	15.6	17.5	1.90	3.06
North Western	0.0	0.3	0.5	0.9	1.0	1.6	3.6	8.0	14.8	13.6	23.5	2.19	3.63

* Rates are calculated using the "old" European Standard Population

Source: OPCS (Unpublished data), analysis by DH Statistics Division 2A

SUMMARY OF EXPERT GROUPS ON ASTHMA AND RELATED TOPICS

DEPARTMENT OF HEALTH

A. ADVISORY GROUP ON THE MEDICAL ASPECTS OF AIR POLLUTION EPISODES (MAAPE).

This group, Chaired by Professor A. Tattersfield, was set up in 1990 by the Chief Medical Officer to look at the short term health effects of episodic exposure to air pollutants. Its terms of reference are:

"To consider whether advice about personal protective measures during air pollution episodes should be given by Central Government and, if so, what that advice should be, to whom it should be addressed, and the criteria which should be adopted before issuing any advice".

The Group has published three reports on "Ozone", "Sulphur Dioxide, Acid Aerosols and Particulates", and "Oxides of Nitrogen". Its final report on The Effects of Exposure to Combinations of Air Pollutants is expected early in 1995.

B. COMMITTEE ON THE MEDICAL ASPECTS OF AIR POLLUTANTS (COMEAP).

This committee, Chaired by Professor S. Holgate, was set up in 1992 with wider terms of reference than MAAPE:

"At the request of the Department of Health,

- a) To assess and advise Government on the effects upon health of air pollutants both in outdoor and indoor air, and to assess the adequacy of the available data and the need for further research.
- b) To co-ordinate with other bodies concerned with the assessment of the effects of exposure to air pollutants and the associated risks to health and to advise on new scientific discoveries relevant to the effects of air pollutants upon health".

The Committee has set up 2 sub-groups:

- 1) Sub-group on asthma (chairman Professor R. Anderson);
- 2) Sub-group on the health effects of particulate air pollutants (chairman Mr R. Waller).

C. NHS CENTRAL RESEARCH AND DEVELOPMENT COMMITTEE (CRDC).

The CRDC has set up a multidisciplinary advisory group chaired by Professor S. Holgate, to identify research and development priorities for the NHS on asthma management. The group meets for the first time in December 1994 and will report to the CRDC in the spring of 1995. It will focus on areas where research is needed in the management of asthma, including issues relating to diagnosis, treatment (primary and secondary prevention) delivery of care and outcomes.

MEDICAL RESEARCH COUNCIL

A. THE MRC WORKING GROUP ON THE ENVIRONMENTAL DETERMINANTS OF ASTHMA.

This is a Working Group, Chaired by Professor A. Taylor, of MRC's Committee on Toxic Hazards in the Environment and the Workplace. Its terms of reference are:

- "1. To determine and review the environmental determinants of asthma.
2. To advise the Committee on Toxic Hazards in the Environment and Workplace of future areas of research which may lead to a better understanding of the environmental determinants of asthma".

The group has recently reported to the main committee.

B. MRC INSTITUTE FOR ENVIRONMENT AND HEALTH.

The Institute has sponsored 2 workshops on:

- 1) Air Pollution and Health - understanding the uncertainties (February 1994);
- 2) Air Pollution and Respiratory Disease - UK research priorities (February 1994).

Reports of the workshops have now been published.

The Institute is acting on behalf of DH, DoE and the MRC in taking forward the programme of research into air pollution and respiratory disease which these agencies have launched. Commissioning of research is expected to begin early in 1995.

GLOSSARY

European Standard Population

For this overview the "old" European Standard Population as defined by the World Health Organisation (1991 World Health Annual of Statistics - based on J Waterhouse et al. (eds). *Cancer incidence in five continents*, Lyon, IARC, 1976 (Vol. 3, p.456)) has been used in the calculation of age standardised mortality rates (see below). The same population is used for males, females and all persons. It consists of a notional population of 100,000 divided into five-year age groups in the following way :-

Age under 1 - 1,000; age 1 to 4 - 6,400; age 5 to 9 and each group up to 50 to 54 - 7,000; age 55 to 59 - 6,000; age 60 to 64 - 5,000; age 65 to 69 - 4,000; age 70 to 74 - 3,000; age 75 to 79 - 2,000; age 80 to 84 - 1,000; age 85 and over - 1,000.

More recently the World Health Organisation has introduced "new" standard populations but it continues to publish statistics standardised using the "old" populations as well as ones using the "new" populations.

General Household Survey (GHS)

The General Household Survey (GHS) is a continuous survey conducted by OPCS which has been running since 1971 and is based each year on a sample of the general population resident in private (that is, non-institutional) households in Great Britain. For 1988 onwards the fieldwork year has been on a financial year basis eg for the 1988 Survey, interviews were conducted between April 1988 and March 1989. In the 1988 survey interviews were obtained with, or in respect of, 25,350 persons of all ages in 10,242 households. For the 1989 Survey the corresponding figures were 25,269 persons and 10,085 households. The data from this survey are not age-adjusted.

Health and Lifestyle Survey (HALS)

The Health and Lifestyle Surveys 1984/5 (HALS1) and 1991/2 (HALS2) were conducted by a team from the University of Cambridge School of Clinical Medicine funded by the Health Promotion Research Trust. HALS1 covered a representative sample of 9,003 adults (18 and over) in households in Great Britain. In 1991/2 those participants in HALS1 who were still alive, could be traced and were able and willing to participate were interviewed again. This resulted in a sample of 5,352 for HALS2. Information given by respondents in HALS2 could be compared with that which they had given in HALS1 thus providing a direct measure of change in their reported health over the period.

Hospital Episode Statistics (HES)

The Hospital Episode Statistics replaced the Hospital In-Patient Enquiry (HIPE) from April 1987. The statistics are based on records of all patients who use a hospital bed, whether as an in-patient or day case, in the NHS in England.

A finished consultant episode is a completed period of continuous care of a patient using a hospital bed, under one consultant in the same DHA, whether or not more than one hospital is involved, which has ended by the patient being transferred to another consultant or discharged. It should be noted that this is not exactly equivalent to a discharge in HIPE.

The episodes for "all diagnoses" shown in this overview exclude more than 800,000 episodes per year where there is no diagnosis. Examples are healthy newborn babies, admissions related to pregnancy, delivery, sterilisation and contraceptive management, and admissions for family, housing and similar reasons.

Further information on HES statistics may be obtained from the Department of Health by telephoning 0171 972 5523.

Hospital In-Patient Enquiry (HIPE)

The enquiry, which was conducted until 1985, was based on a one in ten sample of all non-maternity in-patient records of patients treated in NHS non-psychiatric hospitals in England excluding patients in psychiatric departments of general hospitals, staff patients, convalescent and preconvalescent units and hospitals and healthy babies born in hospital. Day cases are excluded from the data in this overview.

A discharge (or death) was the conclusion of a single period of in-patient care whether the patient returned to his home, was transferred to another hospital or institution, or to maternity or psychiatric care or died. A single patient may therefore account for more than one discharge during the year.

International Classification of Diseases (ICD)

Specific conditions and groups of conditions are classified by an internationally representative group of experts who advise the World Health Organisation, which publishes the complete list. Every disease entity is assigned a number. There are 17 major divisions (chapters) and a hierarchical arrangement of subdivisions within each. Some chapters are "aetiologic", e.g. Infective and Parasitic Conditions; more relate to body systems, e.g. Circulatory System; and some to classes of condition, e.g. Neoplasms. The heterogeneity of categories reflects prevailing uncertainties about causes of disease (and classification in relation to causes).

The latest revision of the classification currently in use, the ninth (ICD-9) has been used in this country for mortality data from 1979 onwards. Data based on the previous classification (ICD-8) which was in effect from 1968 to 1978 are also included in this overview. The effect of the changes between classifications differs for each disease. A new classification, the tenth (ICD-10) has been published, and will form the basis of collected statistics in due course.

Incidence

Incidence is defined as the number of new cases of disease arising per unit time per head of the population at risk.

Morbidity

Morbidity is a measure of ill-health due to a disease, as opposed to **mortality** which is a measure of the extent to which the disease causes death.

Office of Population Censuses and Surveys (OPCS)

The Office of Population Censuses and Surveys (OPCS), is the government department with core responsibilities for conducting and disseminating censuses and registration of births, deaths and marriages as well as expertise in a wider range of activities (surveys, health statistics, population statistics, etc.). Further information on OPCS statistics may be obtained by telephoning 0171 396 2229.

Oxford Record Linkage Study

The hospital in-patient records used in HIPE and HES relate to separate cases only. There is no way of knowing how many of these are for successive admissions of the same person and how many for people admitted once only in the year. The Oxford Record Linkage Study is designed to aid interpretation of the hospital statistics, and to increase their value, by linking those records which relate to admissions of the same person during the year. It covers admissions in the former Oxford Regional Health Authority.

Prevalence

Prevalence is defined as the total number of individuals who have a disease during a particular period per head of the population.

Royal College of General Practitioners (RCGP)

The General Practice Research Unit of the Royal College of General Practitioners has established systems for the regular monitoring of disease.

(a) *Morbidity Statistics from General Practice (MSGP)*. Four studies have been conducted at approximately ten year intervals in collaboration with OPCS, the Department of Health and the Welsh Office. They cover samples of practices with a reasonable geographical spread, but which are not strictly representative, in England and Wales. The Fourth study (MSGP4) was conducted between 1 September 1991 and 31 August 1992 and covered almost 500,000 patients registered with 60 general practices. The earlier studies were somewhat smaller. Details were recorded of every face to face contact which patients had with their general practitioner (GP) (and for MSGP4 also with a practice nurse) in the period.

For the purposes of this study the GP must be the doctor with whom the patient is registered. The data collected are analyzed in many ways including by diagnosis, sex and age. Preliminary results from MSGP4 have been published; a full report is currently in press.

An *episode* is an instance or period of sickness or a health problem during which there was one or more consultations with the GP.

The *patient consulting rate* is the number of patients who consulted at least once during the study year for the condition expressed as a proportion of the total number of persons registered with the practices included in the survey. This indicates the *prevalence* of the condition (as presenting to GPs).

(b) *Weekly Returns Service*. The Weekly Returns Service is exclusively concerned with episodes of illness. From the data information on the incidence, that is the number of instances of illness commencing, is produced.

The *mean weekly incidence* in twelve weekly periods is the weekly average in a twelve week period of the number of instances of acute illness. The annual incidence is the average of the weekly incidence for the whole year.

Sickness and Invalidity Benefit

Sickness and Invalidity Benefit are paid to claimants who are incapable of work because of illness or disablement and who have paid the required National Insurance contributions as an employed or self-employed person. From 14 September 1980 benefit was normally confined to spells of incapacity of more than three days. Since 6 April 1983, most people working for an employer receive Statutory Sick Pay (SSP) for a limited period from their employer instead of Sickness Benefit. Initially employers were liable to pay SSP for a maximum of 8 weeks in any one tax year but from 6 April 1986 this was increased to 28 weeks and the tax year limitation

was removed. Certain persons eg those who do not work for an employer or employees who are excluded from the SSP scheme can still claim Sickness Benefit. Sickness Benefit is normally replaced by Invalidity Benefit after 28 weeks of any period of interruption of employment. The majority of claimants therefore now receive Invalidity Benefit rather than Sickness Benefit. Invalidity Benefit is payable to persons over the normal retirement age, normally up to age 70 for men and 65 for women.

The statistics are based on a 1% sample of claims for statistical years starting on the first Monday in June in 1979/80 and the first Monday in April thereafter.

A spell of incapacity is a single period of sickness of which an individual may have more than one, in the statistical period.

A claim to Sickness and or Invalidity Benefit may have more than one diagnosis stated on the doctors medical certificate, but only one diagnosis can be coded. (Usually the most severe.)

Significance

In testing whether the difference between two results is *significant*, we are testing whether there is very likely to be a real underlying difference, or whether the observed difference could have occurred by chance. For example, in Figure 18, the standardised mortality ratios for eight Regional Health Authorities are shown to be *significantly* different from that for England as a whole, while the SMRs for the other RHAs are not. The *significance level* is the likelihood of obtaining by chance alone an outcome as far or further away from the value for comparison (in this case, the England value) than the one observed. A 5% level of significance indicates that there is a 1 in 20 or less chance, a 1% level that there is a 1 in 100 or less chance and an 0.1% level that there is a 1 in 1000 or less chance.

Social Class

A grouping of occupations into what have been traditionally described as "social classes" was developed in 1911 by Stephenson, Registrar-General of England and Wales. All occupations are classified into five groups, the five "social classes". Social class III is further subdivided into non-manual and manual groups.

- I Professional occupations
- II Intermediate occupations (now called managerial and technical)
- IIIN Non-manual skilled occupations
- IIIM Manual skilled occupations
- IV Partly skilled occupations
- V Unskilled occupations

In the 1991 Census definition volume, and subsequent publications, OPCS have expanded the name "social class" to "social class based on occupation" in order to make its basis more explicit. The social class classification used by OPCS in medical statistics differs from the Socio-economic Group classification used by the Social Survey Division of OPCS in some surveys eg the General Household Survey.

In the data presented in this overview married women are classified according to their husband's social class. Alternative approaches eg to classify women by their own social class can sometimes give markedly different results.

Standardisation

Age Standardised Mortality Rate

Age Standardisation is a way of adjusting a mortality rate for the effects of the age composition of the population it is describing. This enables comparisons to be made over time or between areas which have different population characteristics. The Age Standardised Mortality Rate is the number of deaths which would occur in a standard population (per 100,000) if that population had the age-specific rates of a given area or time period. For this overview the "old" European Standard population distribution, as defined by the WHO (see above), has been used to enable comparisons to be made.

Standardised Mortality Ratio (SMR)

The Standardised Mortality Ratio (SMR), is the measure most widely used in this country to compare mortality rates in different population groupings because it takes account of any differences in the age and sex structures. For example in the case of English data the SMR for England is 100. If the population of a Health Authority demonstrates a mortality rate which is greater than the English average (after taking account of any differences in the age and sex structure), then the Health Authority's SMR will be greater than 100. This comparison could similarly be applied to any subgroup of the England population, eg to a particular age group or ethnic group.

The SMR is derived by calculating as follows:

$$\frac{\text{Observed Number of Deaths}}{\text{Expected Number of Deaths}} \times 100$$

The observed number of deaths is the actual number of deaths in the geographical area or subgroup of the population. The expected number of deaths is calculated by applying the age and sex specific mortality rates for England as a whole to the population of the area or subgroup.

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