



## Seasonal variations in asthma

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Seasonal variations in asthma have been reported in a number of studies. Patterns vary by age, suggesting that different precipitating factors may be involved at different ages.

In this factsheet seasonal variations in new episodes of acute asthma reported to GPs ("new GP episodes") and in hospital admissions for asthma have been expressed in terms of the percentage variation from the underlying trend. Sources of data and methods of analysis are described in the footnote.

### Children

In pre-school and school age children, rates of new GP episodes and hospital admissions show little consistent variation from month to month during the first half of the year (figure 1a and 1b) but levels are generally average or below average.

An increase in new GP episodes and admissions occurs in late June/early July in school age children, but not in pre-school age children.

Throughout the summer holiday period, there is a marked dip in the rate of new GP episodes and in admissions for asthma in both pre-school and school-age children.

A sharp autumn increase in new GP episodes and in admissions occurs in September in both age groups. Hospital admissions are affected more than GP episodes.

A further peak in new GP episodes and admissions occurs in November.

### Adults

Seasonal variations in younger adults (15-44) follow broadly the pattern found in school age children although the summer dip and autumn peak in hospital admissions are of smaller magnitude (figure 1c).

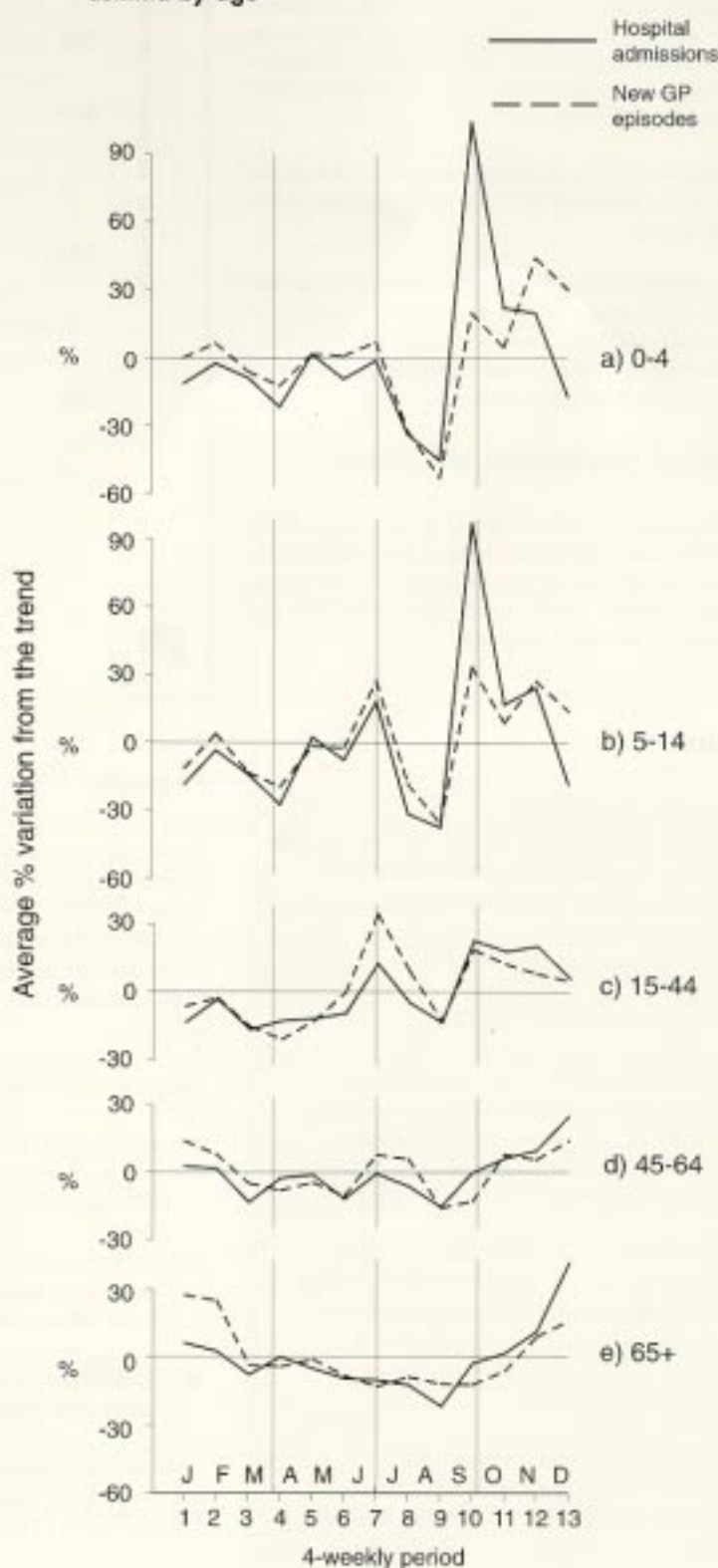
In middle-age (45-64), new GP episodes and hospital admissions (figure 1d) do not exhibit such a clear seasonal pattern but again there appears to be a summer dip followed by an autumn/winter rise.

In the 65+ age group, new GP episodes and admissions for asthma follow a shallow U-shaped curve (figure 1e), with below average levels in spring/summer, and higher levels in winter.

### Variations between years

Differences between years in seasonal patterns are also important. Weekly numbers of hospital admissions can be compared from year to year to identify whether seasonal patterns appear to be consistent from year to year. Note that underlying time trends in admissions may be unreliable due to improve-

**Figure 1: Average 4-weekly percentage variation from the trend in hospital admissions for asthma and new GP episodes of asthma by age**



Source: HES and RCGP Weekly Return Service

ments in the completeness of data during the period covered.

In children a consistent annual pattern is evident in admissions with little variation from year to year (figure 2a) except that the September peak was smaller in 1989 than in other years.

In the 15-44 age group, the summer and autumn peaks and late summer dip in admissions occur in most years, but the early winter pattern is less consistent (figure 2b). A November increase did not occur in 1987 while a marked increase occurred in November 1989.

Admissions in the older age group (45+) also vary from year to year (figure 2c). In this age group there was an even more marked increase in admissions in November 1989 which coincided with the onset of the winter 1989/90 influenza epidemic.

An increase in GP consultations for asthma during the period of the influenza epidemic occurred only in the 65+ age group.

The exceptionally high numbers of admissions in November 1989 tends to bias the seasonal analysis of hospital admissions in older age groups towards a winter increase (figure 1d & 1e), even though such an increase may not occur in a typical year.

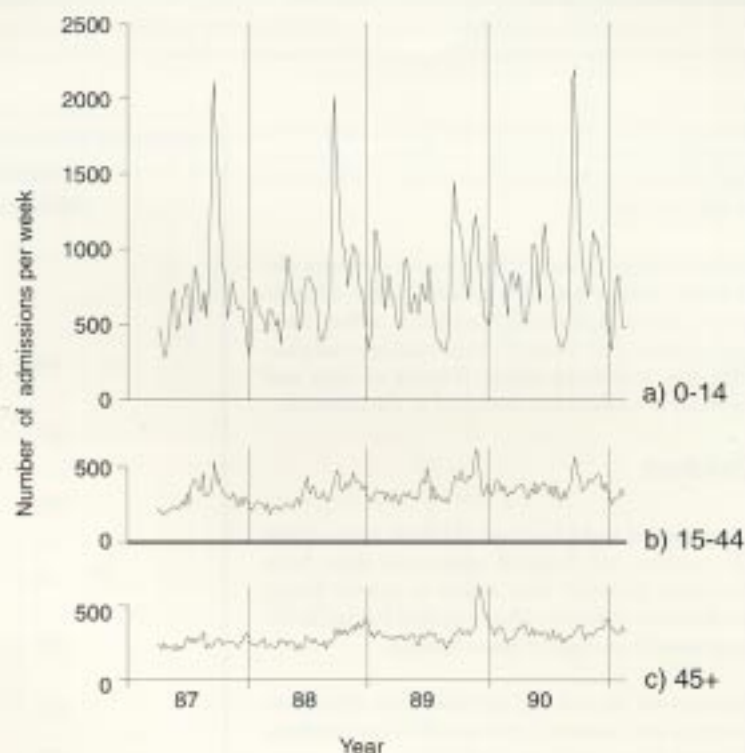
### Seasonal precipitants of asthma

Aeroallergens (eg, pollens, fungal spores, house dust), viral infections, and weather, have all been suggested as possible explanatory factors since they are known to precipitate asthma attacks in sensitive individuals and are subject to seasonal variations.

### Summary

- Seasonal variations in episodes of asthma presenting to health services are most marked in children and younger adults.
- The frequency of asthma episodes increases in school age children and younger adults in June/July.
- The frequency of asthma episodes increases markedly in early autumn in children of all ages and in younger adults. Paediatric admissions are particularly affected.
- In children, new episodes of asthma reported to GPs and hospital admissions for asthma are at their lowest levels during the summer holiday period. During this period they are also less frequent in adults.
- There was a marked increase in asthma admissions in those aged 45+ during the 1989/90 influenza epidemic.

Figure 2: Weekly number of hospital admissions for asthma by age, England 1987/88-90/91



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Source: HES

### Footnote

Seasonal variations in new episodes of asthma reported to GPs and in hospital admissions for asthma have been analysed using data from the Weekly Returns Service (WRS) of the Royal College of General Practitioners for the period 1987-92 and hospital admission (HES) data for the period 1987/88-1990/91. WRS data are described in Fleming DM et al, Annual and Seasonal Variation in the Incidence of Common Diseases. London:RCGP, 1991 (Occasional paper No 53).

Seasonal variations have been calculated as follows:

- weekly new GP episode rates and weekly numbers of admissions have been averaged over 4-week periods for 1987-1992 (GP episodes) and April 1987-February 1991 (hospital admissions);
- each 4-weekly figure has been expressed as a percentage variation from the underlying trend, where the underlying trend has been calculated as a 13-point moving average of the 4-weekly figures;
- the percentage variation from the trend has been averaged over the years for which data were available.

This method is described and illustrated in Khot A, et al, Seasonal variations and time trends in childhood asthma in England and Wales 1975-81. *BMJ* 1984;289:235-237.