

(especially children) are not necessarily admitted.

The role of nurse facilitators and the relationship between asthma attacks and prevalence has been addressed in the paper. We agree with Drs Bernsen and van der Wouden that the explanation of the findings remains elusive.

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I was particularly interested to read the paper by Fleming and colleagues¹ in which they described evidence for a peaking of the UK asthma epidemic in about 1993 and a decline in incidence thereafter. In speculating about possible causes they exclude improvements in pollution, exposure to allergens, or diet at the relevant time.

In 1994 my colleagues and I proposed that dietary change—specifically, the observed reductions in average intake of fresh fruit, vegetables and fish—had been responsible for making the populations of advanced countries more susceptible to allergy,² and that this was the explanation for the increases in the prevalence of asthma observed worldwide. Since then we have published three studies, all different but all showing evidence of a 3–7-fold increase in risk of wheezy illness in relation to the lowest intakes of foods containing antioxidant vitamins.^{3–5} A poor diet does indeed appear to be an important risk factor for asthma.

In the final sentence of our original paper we stated "... if the dietary hypothesis is correct, the favourable trend in eating habits between 1985 and 1991 may already be having a beneficial effect". The trend we referred to was a clear increase in intake of the three foods referred to above, as recorded in the annual national household food consumption and expenditure surveys. We had in mind a decrease in the prevalence of asthma in 10–12 year olds from about the mid 1990s.

The paper by Fleming and colleagues seems to give some further indirect support to our hypothesis. My colleagues and I are currently investigating the influence of maternal diet during pregnancy on allergy in the child, including in these studies fatty acids as well as antioxidants. We believe that a dietary hypothesis for the aetiology of asthma is worthy of very serious scientific investigation, not least because it points to an obvious and simple public health strategy for prevention.

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- 1 Fleming DM, Sunderland R, Cross KW, *et al.* Declining incidence of episodes of asthma: a study of trends in new episodes presenting to general practitioners in the period 1989–98. *Thorax* 2000;55:657–61.
- 2 Seaton A, Godden DJ, Brown K. Increase in asthma: a more toxic environment or a more susceptible population? *Thorax* 1994;49:171–4.
- 3 Soutar A, Seaton A, Brown K. Bronchial reactivity and dietary antioxidants. *Thorax* 1997;52:166–70.
- 4 Bodner C, Godden D, Brown K, *et al.* Antioxidant intake and adult-onset wheeze: a case-control study. *Eur Respir J* 1999;13:22–30.
- 5 Hijazi N, Abalkhail B, Seaton A. Diet and childhood asthma in a society in transition: a study in urban and rural Saudi Arabia. *Thorax* 2000; 55:775–9.

AUTHORS' REPLY We note Professor Seaton's comments in relation to the potential benefits of an improved diet. We find it difficult to reconcile the very diffuse changes in the incidence of episodes of asthma and of acute bronchitis in all age groups peaking at roughly the same time with a diet based hypothesis. It is unlikely that dietary deterioration in the 1980s and improvement in the 1990s would have occurred simultaneously in all age groups and all regions of the country. The seasonal pattern of asthma attacks¹ shows a relationship to pollens (a well recognised allergenic factor), but an even stronger relationship to viral respiratory infections, where the links with allergy are much weaker.

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- 1 Fleming DM, Cross KW, Sunderland R, *et al.* Comparison of the seasonal patterns of asthma identified in general practitioner episodes, hospital admissions, and deaths. *Thorax* 2000;55:662–5.

The paper by Fleming *et al*¹ reporting the decline in the incidence of asthma episodes raises some interesting questions. While they discuss possible reasons for the decline, we suggest the authors have underestimated the impact of trained asthma nurses.

There has been a threefold rise in whole time equivalent practice nurse numbers since 1988 following the new GP contract and the introduction of payment for asthma chronic disease management (CDM) clinics in the early 1990s. While we agree that historically the nurse's role did not include disease diagnosis, the level of asthma care they provide has increased.² Nurse responsibility for CDM ranges from supporting the GP to the diagnosis and management of asthma; specialist training is recognised as important.

The 1992–4 peak in the mean weekly episodes, both by quarter and by region, may reflect increased nurse involvement at that time. Completion of a recognised asthma course has been shown to be associated with favourable patterns of structure, process, and clinical outcomes in general practice,³ as well as reductions in asthma symptoms and numbers of acute attacks where a specialist asthma nurse was employed.⁴ Evidence of improved management in hospitals⁵ by trained asthma nurses has also been reported. Recognised training, as well as the British Thoracic Society's asthma guidelines, have facilitated a more structured management approach and nurses now diagnose and treat new episodes of asthma and suggest appropriate treatment, leading to the development of asthma management protocols and their implementation in primary and secondary care.⁶

We propose that the decrease in the incidence of asthma episodes reported by Fleming *et al* may reflect better management of asthma by GPs as well as increased and improved asthma management by nurses. Although the introduction of specialist nurses would not have had a significant effect on

numbers of consultations for new episodes of asthma, improved management is likely to have substantially reduced numbers of asthma exacerbations. We therefore suggest that the impact of nurses' specialist training on reducing episodes of asthma is greater than is currently recognised.

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- 1 Fleming DM, Sunderland R, Cross KW, *et al.* Declining incidence of episodes of asthma: a study of trends in new episodes presenting to general practitioners in the period 1989–98. *Thorax* 2000;55:657–61.
- 2 Atkin K, Lunt N, Parker G, *et al.* Nurses count. A national census of practice nurses. York: Social Policy Research Unit, University of York, 1993.
- 3 Neville RG, Hoskins G, Smith B, *et al.* Observations on the structure, process and clinical outcomes of asthma care in general practice. *Br J Gen Pract* 1996;46:583–7.
- 4 Dickinson J, Hutton S, Atkin A. Implementing the BTS guidelines. The effect of a nurse run clinic on prescribed treatment in a North Lincolnshire general practice. *Respir Med* 1997;91: 634–40.
- 5 Madge P, McColl J, Paton J. Impact of a nurse-led home management training programme in children admitted to hospital with acute asthma: a randomised controlled study. *Thorax* 1997;25:223–8.
- 6 Barnes GR. Nurses' role in asthma management. *Semin Respir Crit Care Med* 1998;19:6, 593–601.

AUTHORS' REPLY The introduction of trained nurse based management programmes for asthma has undoubtedly been good for asthmatic patients. The contribution made to the changing incidence of new episodes of asthma is difficult to estimate but, as the writers recognise, it is likely to be small. We suspect the main factors associated with the decline are linked with those associated with the increase in the 1980s and with those factors associated with the decline in acute bronchitis—a condition much more frequent than asthma and not generally associated with nurse based care.

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CORRECTION

In the reply by Becklake and Kauffmann to the letter by Morice *et al* entitled "Gender differences in airway behaviour" which appears on page 629 of the July 2000 issue of *Thorax*, an error occurred in the second paragraph. This paragraph should have read: "We thank them for their references. Of particular interest to us was the observation that the cough was higher in premenopausal than in postmenopausal women, an observation in line with our own findings". The authors apologise for this error.