

The contribution of 'holiday deaths' to seasonal variations in asthma mortality in England and Wales

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Summary

Background In younger age groups there is a summer peak in asthma deaths, but whether this is due to social or environmental factors is not known. One suggested social factor is a summer holiday away from home during which there may be a lack of compliance with medication or greater difficulty in getting medical help. In older age groups there is a winter peak in asthma deaths.

Objective To study the contribution of 'holiday deaths' to seasonal variations in asthma mortality in England and Wales.

Methods Routinely collected mortality statistics were used (all asthma deaths of persons dying in England and Wales, 1991–93 and 1995). Deaths occurring 40 miles or more from home were estimated using the District Health Authority in which the person was usually resident; the registration district of death; and the 'transferability code' (derived by the Office for National Statistics).

Results There were 484 asthma deaths in people aged 0–34 years, and 6337 asthma deaths in people aged 35 years or more. Deaths estimated to occur 40 miles or more from home contributed little (16%) to the summer peak in asthma deaths age 0–34 years, and nothing to the winter peak in asthma deaths age 35 years or more.

Conclusions Holidays away from home do not play an important part in explaining the seasonal variation of either young or old asthma deaths. Other social or environmental factors are more important.

Keywords: asthma, death, holidays, mortality, peak, seasonal, summer

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Introduction

Strong age-specific seasonal patterns in asthma deaths have been identified [1–4]. The summer peak in younger age groups is usually the period July to September (for 5–34-year olds in England and Wales) [1]. The winter peak in older age groups is usually the period December to January (for 55–74-year olds in England and Wales) [1], and has been attributed to either viral infections exacerbating asthma or to diagnostic transfer from bronchitis (or chronic obstructive pulmonary disease) to asthma [2].

Asthma admissions to hospitals usually peak in the period July to October, but with a marked dip in August (for 5–34-year olds in England and Wales) [1,5]. In the USA, a summer trough in asthma admissions to hospitals was observed to coincide with a summer peak in asthma deaths (in 5–34-year olds) [3]. Furthermore, a disproportionate number of the summer asthma deaths in the USA occurred outside of hospital [3]. These observations are consistent with the hypothesis that the summer peak in young asthma deaths is due to reduced use, or access to, medical care in the summer months. Alternatively, asthma deaths and admissions to hospital may simply have different principal causes.

A number of factors have been suggested as explanations for the summer peak in young asthma deaths. Suggested environmental factors include seasonal exposure to fungal

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spores [2]. Suggested social factors include: a lack of supervision (either from family, school or medical practitioners) of children and young adults in the summer, and a consequent delay in the recognition of an asthma attack [3]; a reticence in seeking medical attention during the holiday months [4]; or a lack of compliance with medication or difficulty in getting medical help during the August summer holiday [2]. So far little has been done to test the importance of social factors.

This paper investigates whether the summer peak in young asthma deaths is due to deaths occurring 40 miles or more from home, which indirectly also investigates the social factor of taking a holiday away from home.

Materials and methods

Records of asthma deaths (i.e. where the ICD9 code for underlying cause of death was 493) occurring in England and Wales for the years 1991–95 were obtained from the Office for National Statistics (ONS). Data included the District Health Authority (DHA) in which the person was usually resident; the registration district of the death (which is always near to the place where the death occurred); and a 'transferability code' (derived by the ONS). Deaths were recorded as 'transferable' if the person died in an institution that was not in the DHA in which the person was usually resident. This was used as an indication that the death may have occurred 40 miles or more from home. For the years 1991–93 and 1995, all 'transferable' deaths (and a small number of deaths with a missing transferability code) were examined to see if the registration district was 'distant from home', defined as 40 miles or more from the nearest boundary of the DHA of residence. All transferability codes for 1994 were missing, so this year was excluded from the analysis. A small number of deaths related to persons who were either known to be resident outside of England and Wales or for whom there was no recorded DHA of residence. These were all assumed to be deaths 40 miles or more from home.

Deaths were recorded as 'non-transferrable' if the death occurred in an institution in the DHA of residence or if the death occurred outside an institution. The assumption was made that all 'non-transferrable' deaths occurred within 40 miles of home. To check this a random sample of 120 'non-transferrable' deaths from 1991 to 1993 and 1995 were examined. None of these deaths occurred 40 miles or more from home. The 43 'non-transferrable' deaths in July of 0–34 year olds were also examined and none of these occurred 40 miles or more from home.

Results

In the 4 years studied, there were 6821 deaths from asthma. There were 484 deaths (7%) aged 0–34 years, and 6337

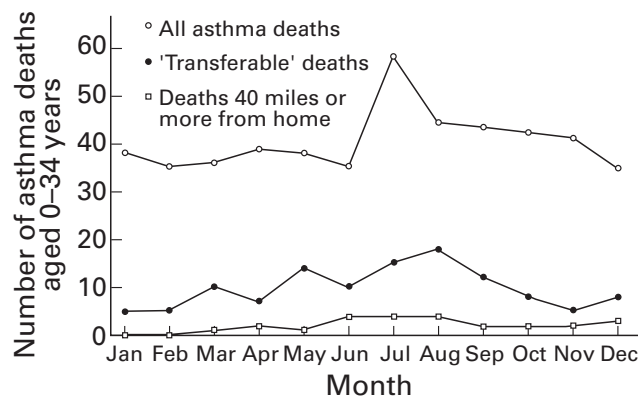


Fig. 1. Asthma deaths aged 0–34 years in England and Wales in the period 1991–93 and 1995.

(93%) aged 35 years or more. There were just 28 deaths aged 0–4 years, which are included in the results.

Asthma deaths 40 miles or more from home (all ages)

Deaths estimated to occur 40 miles or more from home, were most numerous in the months of July, August and December; and least numerous in the months of January, February and November. These are the months we believe to be most and least popular to go on holiday, respectively.

Asthma deaths (age 0–34 years)

Of the 484 deaths in this age group, only 25 (5%) were estimated to be deaths occurring 40 miles or more from home, of which 10 occurred during July, August and September (Fig. 1). These 10 deaths contributed little (16%) to the difference between the average number of deaths per month in July, August and September (48.3) and the average number of deaths in the rest of the year (37.7).

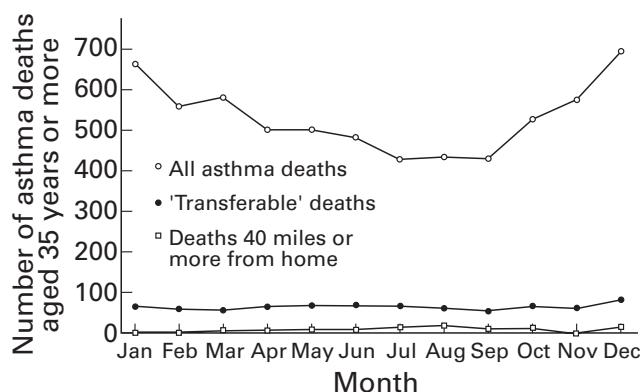


Fig. 2. Asthma deaths aged 35 years or more in England and Wales in the period 1991–93 and 1995.

Asthma deaths (age 35 years or more)

Of the 6337 deaths in this age group, only 92 (1.5%) were estimated to be deaths occurring 40 miles or more from home, contributing nothing to the winter peak in older age groups (Fig. 2).

Discussion

The summer peak in younger age groups and the winter peak in older age groups were consistent with other studies of asthma mortality in England and Wales [1,2,4].

While deaths estimated to have occurred 40 miles or more from home were found to follow a seasonal pattern that would suggest they are a good indicator of deaths occurring while on holiday away from home, they were found to contribute little to the summer peak in younger age groups, and nothing to the winter peak in older age groups (see Figs 1 and 2).

The method used measured the distance from the registration district to the nearest boundary of the DHA in which the person was usually resident. This is likely to underestimate the distance to the person's home and therefore to underestimate both the number of deaths occurring 40 miles or more from home and its seasonal variation. Using the transferability code alone would certainly overestimate both the number of deaths occurring while on holiday away from home, and its seasonal variation.

'Non-transferable' deaths were assumed not to be deaths 40 miles or more from home. Examination of a random sample of these and all 'non-transferable' young asthma deaths in July, found none to have occurred 40 miles or more from home, suggesting that only a few could have been missed by this assumption.

The method used does not identify deaths occurring while

on holiday a short distance away from home, but it would seem likely that most deaths occurring while on holiday away from home occur more than 40 miles from home.

We conclude that holidays (or other reasons for deaths away from home) explain little of the summer peak in young asthma deaths (aged 0–34 years), and none of the winter peak in older asthma deaths. This is reassuring in terms of previous concerns about compliance with medication and access to medical care while on holiday away from home. However, it leaves unidentified the social or environmental determinants of seasonality in young asthma deaths.

Acknowledgements

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