

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Socioeconomic and geographical variation in general practitioner consultations for allergic rhinitis in England, 2003 to 2014: an observational study
<b>AUTHORS</b>	Todkill, Dan; Loveridge, Paul; Elliot, Alex; Morbey, Roger; de Lusignan, Simon; Edeghere, Obaghe; Smith, Gillian

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Hyeongsu Kim KonKuk University, Seoul, Republic of Korea
<b>REVIEW RETURNED</b>	17-Apr-2017

<b>GENERAL COMMENTS</b>	<p>The present study showed the seasonal variation through the several years. In addition, the authors also showed the relative risks between Socioeconomic difference in allergic rhinitis. The study design was well designed. The statistics were useful to spread the importance of SES as well as residence environments in asthma.</p> <p>The current status is enough to publish.</p>
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<b>REVIEWER</b>	Roy Gerth van Wijk Section of Allergology, dept. of Internal Medicine, Erasmus Medical Center, Rotterdam, the Netherlands
<b>REVIEW RETURNED</b>	12-Jun-2017

<b>GENERAL COMMENTS</b>	<p>The paper entitled “ “ describes the epidemiology of AR consultations in England, thereby reporting the mean weakly rate of AR consultations, peaks in consultations over the year and factors that influence the rate. An important outcome is the effect of socio-economic deprivation on AR consultation rates. The study comprises a large number of GP practices and consequently a large sample size..</p> <p>The paper is straightforward and well-written. The limitations of the study are well addressed. I have a few remarks:</p> <p>Methods: The quality of the data depend on the accuracy of the diagnosis. As a non-UK clinician it is not clear to me how GPs establish the diagnosis of allergic rhinitis, allergic rhinosinusitis or hayfever. Is this a diagnosis made by the history or is the diagnosis generally supported by IgE tests? Heterogeneity in the ways of assessing the diagnosis may interfere with the results. Are the codes for children the same as for adults? Perhaps it is good to list all codes used. I understand that the H17 codes have more subcategories.</p>
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	<p><b>Results</b>  The prevalence of physician diagnosed AR is estimated at 13.2%. Is the outcome of this study in line with the data from Bachau 2004? It seems to me that the first and second peak coincide with respectively the birch pollen and grass pollen season, but the authors do not make any reference to these seasons. I suppose that the absence of changes in long-term trend as shown in figure 1 can be statistically confirmed.</p> <p><b>Discussion</b>  I think that the high AR consultation rate for patients in the age range 5-14 is in line with the peak incidence of allergic rhinitis in that same age group. Perhaps the authors can refer to that with some literature.  The authors mention that the absence of a change in trends might be due to changes in data sources, but at least the 2002-2012 data could confirm an absence of changes in trends. Perhaps, this should be emphasized.  Exploration of GP prescriptions.... (page 13 line20-22) has been done in the UK by Price et al UK prescribing practices as proxy markers of unmet need in allergic rhinitis: a retrospective observational study Primary care respiratory medicine 2016  In the discussion the authors state that according to the literature boys are at a higher risk until puberty, when this situation reverses thus resulting in equal risk in males and females in adulthood, whereas this is not observed in this study. However, the gender difference in this study has not be analyzed by age group. I suggest to do these analyses.</p>
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### VERSION 1 – AUTHOR RESPONSE

#### REVIEWER ONE

Thanks to Professor Kim for the positive comments and interest in the paper’s content.

#### REVIEWER TWO

We thank Professor Gerth van Wijk for his detailed comments, and positive overview of the paper.

#### Methods

The quality of the data depend on the accuracy of the diagnosis. As a non-UK clinician it is not clear to me how GPs establish the diagnosis of allergic rhinitis, allergic rhinosinusitis or hayfever. Is this a diagnosis made by the history or is the diagnosis generally supported by IgE tests? Heterogeneity in the ways of assessing the diagnosis may interfere with the results.

Author response: thank you for this useful comment. To clarify for an international audience we have added the following lines to the methods study design section:

“In the UK, the clinical diagnosis of allergic rhinitis is usually established based on presenting symptoms and medical history; in particular the presence or absence of antecedent triggers.”

Are the codes for children the same as for adults? Perhaps it is good to list all codes used. I understand that the H17 codes have more subcategories.

Author response: thank you for highlighting this point. To clarify, there are no different codes used specifically for adults and children. We think that the inclusion of “and child codes” may have caused some confusion, and as such have removed the two references to this phrase in the methods study

design section.

## Results

The prevalence of physician diagnosed AR is estimated at 13.2%. Is the outcome of this study in line with the data from Bachau 2004?

Author response: thank you for highlighting this point. The use of syndromic surveillance data precludes the ability to calculate prevalence rates. We therefore think that providing an estimate of prevalence in our paper may cause confusion; from our methodology we are not reliably able to provide such a measure.

It seems to me that the first and second peak coincide with respectively the birch pollen and grass pollen season, but the authors do not make any reference to these seasons.

Author response: thank you for this helpful comment. We agree that these two peaks appear to approximately coincide with tree and grass pollen peaks and as such amended the text in the discussion to reflect this and included a new reference to a publication that has previously indicated this.

“These seasonal peaks appeared to approximately coincide with tree and grass pollen seasons, which have been previously defined for the UK summer.<sup>26</sup>”

New reference:

26. Ross A, Corden JM, Fleming D. The role of oak pollen in hay fever consultations in general practice and the factors influencing patients' decisions to consult. *Br J Gen Pract* 1996;46(409):451-55.

Additionally, some of our further work beyond this paper has indicated that the relationship between the different pollen taxa and consultations for allergic rhinitis is likely to be complex and have amended a paragraph in the discussion as such:

“The absence of a long term increasing or decreasing trend in GP consultations for AR is consistent with an earlier study which used RCGP data from practices in Darlington, Derby and London (cities in England) between 1981 and 1992.<sup>16</sup> The study observed two distinct peaks annually and the authors concluded that the peaks coincided with weeks with the highest grass pollen counts. This study also reported an age distribution that was similar to that observed in our study. The relationship between the different taxa of pollen and GP consultations for AR is likely to be complex, and might be further elucidated through time series methodologies.”

I suppose that the absence of changes in long-term trend as shown in figure 1 can be statistically confirmed.

Author response: we did check this observation statistically initially but did not include this in the paper. We adjusted for seasonality by aggregating over the individual years and used a chi-squared test for trend in proportions. During the entire study period, there was no significant trend observed (p value = 0.6715), nor during the 2002-2012 period (p value = 0.2214). Due to – already described – limitations of the change in the data source and clear pattern on visual examination of the data we did not feel this would add significantly to the paper.

## Discussion

I think that the high AR consultation rate for patients in the age range 5-14 is in line with the peak incidence of allergic rhinitis in that same age group. Perhaps the authors can refer to that with some

literature.

Author response: thank you for this comment. We can confirm that we did observe a higher consultation rate in this age range, but have been unable to find robust evidence or confirmation in the literature that the higher incidence lies in this specific age group.

The authors mention that the absence of a change in trends might be due to changes in data sources, but at least the 2002-2012 data could confirm an absence of changes in trends. Perhaps, this should be emphasized.

Author response: We have added an additional sentence in the discussion to emphasise this:

“However, analysis of data from one provider covering the period 2002-12 illustrated a lack of trend thereby supporting our overall conclusions.”

Exploration of GP prescriptions.... (page 13 line 20-22) has been done in the UK by Price et al UK prescribing practices as proxy markers of unmet need in allergic rhinitis: a retrospective observational study Primary care respiratory medicine 2016 In the discussion the authors state that according to the literature boys are at a higher risk until puberty, when this situation reverses thus resulting in equal risk in males and females in adulthood, whereas this is not observed in this study. However, the gender difference in this study has not be analyzed by age group. I suggest to do these analyses.

Author response: whilst we agree with the reviewer that this is an interesting and important area we feel that it is not possible to undertake the analysis required within the remit of the current study. In order to address this with sufficient rigour we would need to undertake a further analysis, ideally linking GP consultation data with prescribing items.