

SHORT REPORT

Emerging trends in the UK incidence of occupational asthma: should we be worried?

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ABSTRACT

While 15% of adult-onset asthma is estimated to have an occupational cause, there has been evidence of a downward trend in occupational asthma incidence in several European countries since the start of this millennium. However, recent data from The Health and Occupation Reporting network in the UK have suggested a possible reversal of this downward trend since 2014. We present these data and discuss possible explanations for this observed change in incidence trend. A high index of suspicion of occupational causation in new-onset asthma cases continues to be important, whether or not the recently observed increase in occupational asthma incidence in the UK is real or artefactual.

INTRODUCTION

It has been estimated that approximately 15% of asthma cases in adults are work related.¹ However, there is evidence, from the national reporting and compensation schemes in several European countries, of a decrease in occupational asthma (OA) incidence in the first decade of this millennium.^{2,3} These data patterns might reflect increased reporter fatigue and continuing under-recognition of occupational causation of asthma but could also be the reason for optimism that preventative measures have been taking their intended effect.⁴

In the UK, incident cases of OA are reported by respiratory physicians to the Surveillance of Work-related and Occupational Respiratory Disease (SWORD) scheme,⁵ a component of The Health and Occupation Research (THOR) network.⁶ A key aim of the voluntary reporting schemes within THOR is to pick up signals that may indicate a change in workplace risk profiles or adequacy of risk control measures, that might require further investigation and preventative action. We report on an observed reversal of the downward trend in OA incidence in the UK since 2014 suggested by SWORD data and discuss possible explanations.

METHODS

The SWORD network includes a group of 'core reporters' who have a particular interest in occupational respiratory disease and report cases of work-related respiratory disease that they identify throughout the year. In addition, there is a much larger group of 'sample reporters' who record cases for only 1 month each year. In August 2018, the network comprised 17 core reporters and 347 sample reporters, but there is some fluctuation in

Key messages**What is already known about this subject?**

- ▶ A significant proportion of new-onset asthma in adults is caused by workplace exposures, but there has been a reported decrease in the incidence of occupational asthma (OA) in several European countries from 2000 to 2012.

What are the new findings?

- ▶ We present data suggesting a possible increased incidence of OA in the UK since 2014.

How might this impact on policy or clinical practice in the foreseeable future?

- ▶ The possible increase in UK OA incidence since 2014, whether real or artefactual, reinforces the importance of good control of exposure to respiratory sensitisers in the workplace and prompt referral of possible cases to specialists with expertise in OA.

both core and sample reporters over time. In this study, changes in relative annual incidence rates from 1999 to 2017 were determined for OA using an adaptation of previously described methods.⁷ Such an approach allows trends in incidence rates to be monitored without determining absolute incidence rates, which can be affected by variation in reporter numbers.

A multilevel mixed effects (negative binomial) model with a random intercept was fitted in Stata V.14. This accounts for the presence of clustering, specifically the within and between variation in the multiple responses per reporting physician, for example, 'core' versus 'sample'. The number of actual cases, including zeros (a physician not seeing any relevant cases during their reporting month should notify SWORD to this effect), per reporter per month, was the dependent variable. The main predictor of interest, calendar time, was represented as a categorical variable with 2017 as the comparison year, or as a mean centred continuous variable with a scale of years. Variables representing other potential confounders were also included.⁷ To account for changes in the population base, an offset variable representing the UK working population each year from 1999 to 2017 was included.

RESULTS

There were 2630 cases of OA reported to SWORD between 1999 and 2017, accounting for 19% of



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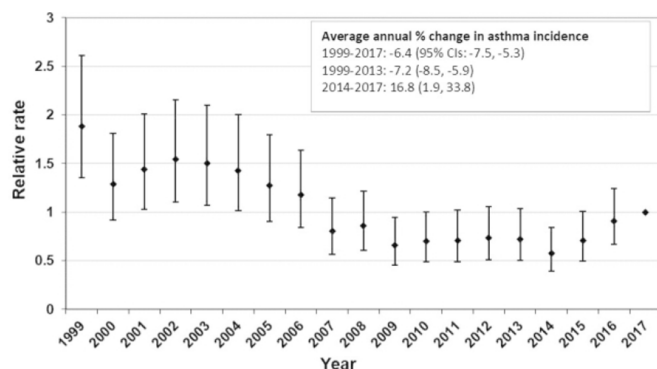


Figure 1 Relative incidence rates, with 95% CIs, of occupational asthma as reported by chest physicians to SWORD by year (2017 estimate=1). SWORD, Surveillance of Work-related and Occupational Respiratory Diseases.

all SWORD reports during the same time interval. The trend in OA incidence rates between 1999 and 2017, as determined by SWORD data, is illustrated in figure 1.

After sequential decreases in incidence rates between 2002 and 2007, plateauing is observed between 2007 and 2014 followed by an apparent upward trend from 2014 to 2017. The average annual change in asthma incidence was -7.2% (95% CI -7.5 to -5.3) between 1999 and 2013 and 16.8% (95% CI 1.9 to 33.8) between 2014 and 2017.

DISCUSSION

We have described a possible early indication that the previously observed downward trend in OA incidence in the UK has reversed between 2013 and 2017. Interpretation of the data needs to be guarded as there are possible artefactual explanations which will be discussed. Nevertheless, it is also possible that there has been a true increase in OA incidence since 2014 which needs to be highlighted.

Possible sources of bias always need to be considered in any examination of incidence rates in voluntary reporting schemes. Investigations of reporter 'fatigue' suggest some evidence of this phenomenon among SWORD 'sample' reporters but not among SWORD 'core' reporters, probably reflecting the strong commitment of stalwart 'core' SWORD reporters.⁸ As SWORD 'sample' reporters contribute proportionally less data than their 'core' counterparts (21%), the impact of 'fatigue' on the trend estimate is likely to be small. While our statistical model does not adjust for individual reporter fatigue, were such adjustment possible, it would be likely to only increase the magnitude of the rise in relative incidence observed in the most recent years of the study period.

The possibility that from 2014 onwards, the overall impact of reporter fatigue suddenly reduced, for example, if there had been a cluster of newly appointed physicians with greater enthusiasm for reporting cases, is to some extent controlled for in the model. Adjustment is made for the 'first-month effect' whereby an excess of reports might be received from a newly recruited reporter in their first reporting month due to 'harvesting' of cases. Furthermore, there was no apparent surge in reporter recruitment in the period 2013–2017.

Another possible artefactual explanation is that there has been an increase in recognition of occupational causation of new-onset asthma in adults. Of note, the version of the clinical guideline published in 2013 by the UK National Institute of Clinical Excellence⁹ provided all physicians with clear guidance on the need to consider and further investigate occupational causes of adult-onset asthma, consistent with existing guidance from the British Thoracic Society.¹⁰ If our data represent a true increase in OA incidence since 2014, it could reflect changes in workplace exposures, their control measures or an increase in numbers of workers exposed to respiratory sensitizers. Simple inspection of the SWORD database has not revealed any clear change in the predominance of any specific sector or causative agent.

In conclusion, relative OA incidence rates need to be monitored over a longer duration than 3 years before the significance of these SWORD data become clear. However, regardless of whether or not the apparent recent change in trend direction is real, it is a reminder of the importance of continued vigilance by employers with preventative strategies in compliance with health and safety legislation. On the other hand, it could be a reflection that greater physician awareness is starting to improve the diagnostic yield of OA cases that in previous years might not have been picked up. Early identification and referral of OA cases to an appropriate specialist, with a particular interest in occupational lung disease, can significantly improve the prognosis for patients who have developed asthma as a result of their work.

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