occupations with an a priori risk of COPD and chronic respiratory symptoms, remained after adjustment for age and smoking status, using pack year history. The strength of the relationship between symptoms and work varied by occupational type; cleaners, painters and agricultural workers had the highest risk of breathlessness when compared to the referent population (Abstract S2 Table 1). An increased risk of doctor-diagnosed COPD (COPD, chronic bronchitis or emphysema) was also found in cleaners, transport workers, wood and construction workers (data not shown); in comparison with the prevalence of respiratory symptoms, the number of men declaring doctor-diagnosed disease was small (21% vs 5%). This study demonstrates an association between occupational exposure, chronic respiratory symptoms and doctor-diagnosed COPD within a general population of older males in the UK independent of smoking history. Further characterisation of the cohort, using the results of spirometry, will allow the relationship between risky job exposure and disease to be examined in more detail.

REFERENCE
1. European Community Respiratory Health Survey.

**S3**
WORK PERFORMANCE AND AIRFLOW OBSTRUCTION IN A GENERAL UK POPULATION OF OLDER WORKERS

doi:10.1136/thoraxjnl-2011-201054b.3


Work disability as a consequence of COPD has been found in a number of patient cohorts and respiratory symptoms were shown to be significantly associated with work limitation in the Lungs at Work study.1 The impact of airflow obstruction on impaired work performance in the general population is unknown. The clinical assessment was designed to examine the relationship between respiratory symptoms and work performance in a general population of older workers in more detail. Volunteers in full time employment at the time of the initial postal questionnaire study (of 51 to 60-year olds through general practice) underwent clinical assessment, including spirometry (n=1773). Results are shown in Abstract S3 Table 1. Prevalence of declared doctor-diagnosed COPD was low (1.9% of men and 0.6% of women) compared to that of airflow obstruction on spirometry (post-bronchodilator FEV₁<80% predicted and FEV₁/FVC ratio <0.7) was higher, similar to previous published estimates. Men and women with airflow obstruction had a significantly higher prevalence of poor self-reported performance at work than individuals with normal spirometry. Subjects of both sexes with abnormal spirometry who also reported high levels of physical activity in their current job were significantly more likely to report poor work performance than individuals without airflow obstruction with similarly high activity levels; this difference was not seen in low activity work (data not shown). Men were significantly more likely than women to predict that they would stop work due to ill-health. In both sexes, participants with abnormal spirometry were significantly more likely to predict ill-health retirement than individuals with normal lung function. This study has demonstrated an association between airflow obstruction and both work performance within a general population of older workers; the level of physical activity required at work had an important effect on this relationship. Future loss from the workforce due to ill-health was also related to lung function. Detection of airflow obstruction could aid retention in employment, provided that suitable interventional strategies are in place to support older workers.

REFERENCE

**S4**
OCCUPATIONAL ASTHMA: IS THIS THE CAUSE OF EXCESS RESPIRATORY SYMPTOMS AND COPD DESCRIBED IN BITUMEN EXPOSED WORKERS?

doi:10.1136/thoraxjnl-2011-201054b.4

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Introduction Epidemiological studies suggest increased risk of asthma and COPD in asphalt exposed workers.1 Bitumen is used in this industry. In this case we describe occupational asthma caused by bitumen exposure in a lab environment. This is the first such report to our knowledge.

Case History A 49-year old male with no history of asthma or atopy and <5 pack years smoking history presented with airflow obstruction on surveillance spirometry, cough and wheeze. He analysed hot bitumen samples (1900 C) in a lab environment without using respiratory protective equipment. Spirometry FEV₁ 57%, FVC 85% ratio 55%. Respiratory symptoms improved after 3 weeks off work, returning soon after he rejoined the lab. Peak flow rates were variable and lower at work. Analysis with OASYS scored 3.08 (Abstract S4 figure 1). Histamine challenge test was positive (PC20 2.216 mg/ml). Skin prick test to paraldehyde was positive. After 8 weeks away from the exposed environment the subject was asymptomatic, continued to have obstructive spirometry but improved bronchial reactivity (PC20 7.489 mg/ml) without medication and improved peak flows with little diurnal variation. One week after restarting work the respiratory symptoms returned. Repeat OASYS charts scored 3.14 with histamine reactivity similar to baseline (PC20 2.81 mg/ml) after 4 weeks. A specific challenge test was not possible due to the problems with heating bitumen to 1900°C in the hospital lab.

Conclusion The progression of symptoms and lung function in relation to work history supports the diagnosis of occupational asthma induced by bitumen fume exposure. This has not been reported previously. The possible mechanisms include sensitisation to short chain aldehydes, produced by partial combustion of

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Abstract S3 Table 1

<table>
<thead>
<tr>
<th>Airflow obstruction* n, %</th>
<th>Poor work performance</th>
<th>High level of physical activity at work</th>
<th>Health will limit ability to work</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men (n=1101)</strong></td>
<td><strong>Women (n=672)</strong></td>
<td><strong>Men (n=1101)</strong></td>
<td><strong>Women (n=672)</strong></td>
</tr>
<tr>
<td>Poor work performance</td>
<td>112 (10.4)</td>
<td>54 (8.2)</td>
<td>0.129</td>
</tr>
<tr>
<td>High level of physical activity at work</td>
<td>77 (7.3)</td>
<td>25 (3.9)</td>
<td>0.004</td>
</tr>
</tbody>
</table>

**Post-bronchodilator FEV₁ <80% predicted and FEV₁/FVC ratio <0.7.**

REFERENCE
bitumen which oxidises at these temperatures. Other potential sensitisers contained in bitumen are nickel and vanadium. Further studies are needed to investigate the by-products of heated bitumen and whether the previously described excess of COPD and respiratory disease in these workers is due to unidentified occupational asthma from bitumen fume exposure.

REFERENCE

Abstract S4 Figure 1

THE PREVALENCE OF ASTHMA AMONG CLEANERS IN THE UK

doi:10.1136/thoraxjnll-2011-201054b.5

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Background A number of epidemiological studies have shown a significant association between asthma and working as cleaner but reporting schemes and workforce surveys have identified typical features of occupational asthma in only a small minority. This discrepancy is either due to under-reporting, misattribution of work-exacerbated asthma, or development of occupational asthma with atypical symptoms that make it difficult to diagnose clinically.

Aim To determine the prevalence of asthma in a cohort of hospital and university cleaners in the UK.

Methods A respiratory symptom questionnaire was distributed to cleaners via their supervisors in 3 local hospital trusts and 2 universities.

Results 570 of an estimated 1400 cleaners (41%) returned the questionnaire but it is uncertain how many received it and so the true response rate is uncertain. Respiratory symptoms were common. 48% (272/570) of the cleaners reported at least one: 34% reported wheezing, 35% reported cough, 10% reported breathlessness and 11% reported chest tightness. Night-time or early morning symptoms suggestive of asthma were reported by 35% of the cleaners. 12% reported symptoms only following exposure to chemicals used at work. 14% of the cleaners reported physician-diagnosed asthma. In 30% asthma developed after they started work as a cleaner with a mean interval of 8 years. An additional 5% had taken asthma medication in the last 12 months without a clinical diagnosis of asthma.

Conclusion This study has identified a high prevalence of asthma among cleaners in the UK and a substantial proportion that developed it after first exposure to cleaning agents. Symptoms on exposure to cleaning agents were also common. Further investigation of the risk factors for asthma and the work-relatedness of the symptoms of asthmatic cleaners are planned.

Abstract S6 Table 1

Results of three bakery worker respiratory surveillance rounds 2006—2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Level 1 questionnaires sent</th>
<th>Level 2 questionnaire completed (n,%).</th>
<th>Serum samples requested n,(n)</th>
<th>Serum samples received (n)</th>
<th>Positive specific IgE to either flour or α-amylase (n,%).</th>
<th>Positive IgE and symptoms seen in clinic (n,%).</th>
<th>Workers with occupational asthma (n,%).</th>
<th>Occupational rhinitis (n,%).</th>
<th>Disease Prevalence (OA +/− OR, % of original Level 1 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>3780</td>
<td>571 (15%)</td>
<td>89 (16%)</td>
<td>84</td>
<td>16 (19%)</td>
<td>16</td>
<td>4</td>
<td>7</td>
<td>0.2</td>
</tr>
<tr>
<td>2008</td>
<td>3243</td>
<td>423 (13%)</td>
<td>66 (16%)</td>
<td>66</td>
<td>5 (8%)</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0.03</td>
</tr>
<tr>
<td>2010</td>
<td>3833</td>
<td>626 (16%)</td>
<td>80 (13%)</td>
<td>89*</td>
<td>14 (16%)</td>
<td>14</td>
<td>5</td>
<td>4</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Total numbers of employees completing each round with proportions, expressed as percentages of previous surveillance step, are shown where appropriate. Disease prevalence is expressed as a percentage of the baseline population.

*Samples received through occupational health include those from subjects declaring symptoms between surveillance rounds, hence number can be greater than samples requested during routine surveillance.