

results support the hypothesis that asthma in cleaning workers is predominantly irritant-induced.

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#### THE USE OF CLEANING PRODUCTS AT WORK AND AT HOME AND ASTHMA SYMPTOMS: A NESTED CASE-CONTROL STUDY IN EMPLOYEES OF CLEANING COMPANIES

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**Objectives** Cleaning workers are at elevated risk of asthma. Many products used in this sector are also widely used in private homes. We studied the relationships between asthma symptoms and the use of specific cleaning products at work and at home.

**Methods** Forty-two cases (mean age 42 y) with asthma symptoms and 53 controls (age 48 y) without a history of asthma or lower respiratory tract symptoms participated in a case-control study nested within a cohort of cleaning workers. Information on the use of cleaning products at work and at home in the last year was obtained in face-to-face interviews. Associations between asthma and the use of specific cleaning products at work were evaluated using logistic regression analyses adjusted for age, sex, smoking status and domestic use.

**Results** Hypochlorite bleach (91%), soaps (61%) and acidic scale removers (45%) were the most frequently used products at work. Use of ammonia and multi-use cleaners at work was reported more often among cases than controls; OR 2.7 (95% CI 0.9 to 8.3) and 2.3 (0.7 to 6.9), respectively. The risks increased with the duration of use (p-trend for multi-use 0.05). The highest risks were found when products were used both at work and at home (multi-use cleaners OR 4.8; 1.3 to 18, ammonia OR 3.2; 0.7 to 15).

**Conclusions** Exposure to irritant cleaning products at work and at home is associated with asthma symptoms. These