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Rebuttal from Dr. Platts-Mills and Colleagues

The arguments proposed by von Hertzen and Haahtela in their Con editorial (*see pp. 113–119*), in keeping with earlier reports from our group as well as those of Pearce and colleagues, are based on the assumption that measurements of allergen in a child's home are a useful surrogate for real measurements of exposure of the child's nose and lungs (1, 2). There are obvious and not-so-obvious situations where this is not true. The first assumption is that differences in real allergen exposure between houses are sufficiently large that single (or repeated) samples of dust from a house will provide a guide to *differences* in exposure. The reliability of measurements depends on sampling techniques, assay techniques, and variations both within the home and over time (3). The seven studies reported in their Table 1 only reflect

results from four groups. For two of them the study age is too young, i.e., age 5 and age 4; in addition, the range of mite results is insufficient to reach firm conclusions (4, 5). For the two studies quoted from Detroit, mite levels are generally low, and the primary impact of the study was on the effects of cat and dog exposure (6). The second assumption is that relevant exposure to the allergen occurs either exclusively or predominantly in the child's home. A major change has occurred in our understanding of the role of exposure outside the home. It is now clear that living in a house with a cat (or dog) does not increase the risk of asthma or of sensitization to that animal (6, 7). Indeed in some studies the majority of children with cat allergy had never lived in a house with a cat (8). Until recently, it was tacitly assumed that exposure

to mite allergens occurred exclusively in the child's home. The results of the allergen avoidance study in Manchester, UK, challenge that assumption. They found that despite extensive reductions in exposure in the children's homes, many of the children still became sensitized to mite allergens (9). This must reflect exposure in the homes of friends or relatives, because sensitization to mites is rare among children who live in an area where none of the homes have significant mite allergens (10). In areas with low humidity, levels of mite allergen are low in all homes and measurements of the minor differences are not meaningful (11, 12). Equally, in areas such as New Zealand or Venezuela, exposure is high in almost all homes. In these areas, measurement of exposure is only useful on a population basis (10).

If we now consider the evidence about asthma in Finland and the adjacent region of Russia, there are obvious problems. As these studies show, mites are low or absent in Finland and it is unlikely that mite allergy contributes to asthma in that country. The data provided about mites in Karelia is not adequate to make a judgment (*see* von Hertzen and Haahtela's online Table E1). More important, we don't know enough about lifestyle in that area to judge whether it is comparable to that in the west 50 years ago when asthma was also rare. Equally, the prevalence of mite sensitization, which is low (i.e., 9%), is based on skin tests presumably using a cutoff of 3 mm in diameter (13). The strength of sensitization as judged by the size of skin tests or the titer of IgE ab strongly influences the risk of asthma (14, 15). Experience in the Norbotten region of Sweden would suggest that very few subjects in Finland or Karelia would have IgE ab to mite of 3 or more IU/ml (10). Taken together, we consider that neither the cohorts shown in Table 2 of our Pro editorial (*see* pages 109–113), nor the data comparing Finland with Karelia provides any significant evidence against the role of mites in the occurrence of asthma.

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Rebuttal from Drs. von Hertzen and Haahtela

House dust mite emerged as a hot topic in asthma research particularly after the publication of the first prospective study in 1990 (1), in which a causal association between dust mite exposure and the development of asthma was suggested. This study, however, was small, comprising only 59 high-risk children for whom an early dust sample was available. A larger study from the 1990s (2), and several more recent and well-conducted prospective studies comprising more than 4,000 unselected and high-risk children, have been unable to corroborate that early finding (reviewed in our Con editorial; *see* pp. 113–119).

Platts-Mills and colleagues, in their Pro editorial (*see* pages 109–113), cited studies suggesting that staying at high altitudes in sanatoriums or in hospital rooms improve the condition of patients with asthma. This may well be the case, but an assessment of the role of dust mites separately in these settings is impossible. A decrease in levels of cat and dog allergens and pollens, for example, as well as a decrease of indoor tobacco smoke, are probably also involved. Many factors, including psychological ones, are likely to make the patient feel better. Generally, Platts-Mills and coworkers' arguments of a decrease in exposure

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