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No funding was received for this work.
Conflicts of interest: The authors declare that they have no relevant conflicts of interest.
Received for publication April 9, 2020; accepted for publication April 9, 2020.
Available online April 20, 2020.
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https://doi.org/10.1016/j.jaip.2020.04.028

Analyzing environmental control studies by the achieved decrease in exposure

To the Editor:

In his recent editorial, Eggleston[1] discussed the limitations of analyzing environmental control trials by only comparing the active intervention group and the control group—where the control group, knowing that it is in a study concerning a potentially harmful environmental substance, also decreases its exposure—and he noted that information is to be gained by also sorting data according to the actual decrease in allergen achieved. Specifically, a study of mouse-allergen remediation,[2] in which there were similar reductions in household allergen exposure and asthma activity in both the active and control groups, showed decreased disease activity when the data were sorted by the decrease in the final allergen level, with each 50% decrease in bedroom floor mouse allergen level associated with a further reduction in asthma symptoms, beta-agonist use, and emergency department visits for asthma. A recent follow-up of that study cohort[3] also showed that a reduction in mouse allergen exposure by 75% or more, whether in the active remediation group or the control group, was associated with a greater increase over 1 year in prebronchodilator forced expiratory volume in 1 second and in pre- and postbronchodilator forced expiratory flow at 25% to 75% of forced vital capacity.

It should be noted that this approach has also been applied to dust mite allergens. In his comprehensive book *Dust Mites*, Colloff[4] revisited the Cochrane meta-analysis on house dust mite control measures for asthma.[5] That meta-analysis, comparing all combined treatment groups with all combined control groups, had concluded that there were no statistically significant differences in number of patients improved, asthma symptom scores, or medication usage. However, the studies in that meta-analysis used different methods, of differing effectiveness, in their effort to decrease mite allergen exposure. When Colloff separated those studies that showed clinical improvement from those that did not, he found that only in the former had there been a significant decrease in allergen levels in the active group compared with the controls.

Allergen avoidance studies can thus yield 2 distinct types of information: the effectiveness of measures to reduce allergen levels, which can be obtained by comparing active and control groups, and the clinical effects of such reduced allergen exposure, which can be obtained by comparing those with decreased exposure with those without such a decrease. Environmental control studies should be looked at with both questions in mind.

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No funding was received for this work.
Conflicts of interest: J. D. Miller is the owner and CEO of Mission: Allergy, Inc., a manufacturer and distributor of products for allergen avoidance.
Received for publication February 17, 2020; accepted for publication February 20, 2020.
Available online April 20, 2020.
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https://doi.org/10.1016/j.jaip.2020.02.045