Abstract

BACKGROUND: To interpret individual measurements of house dust mite (HDM) allergen and to design and analyse HDM studies it is necessary to quantify the variability which is inherent in the measurement of this exposure.

OBJECTIVE: To estimate the repeatability of one method of HDM allergen measurement.

METHODS: We analysed data from one or more HDM allergen measurements in 215 houses included in four previous studies conducted in Sydney (a high allergen environment) and Busselton, Western Australia (a moderate allergen environment). Samples were collected from the bed by vacuuming above and below the sheets and inside the pillow case and from the bedroom and living room floors by vacuuming a 1 m² area for 1 min. Extracts from aliquots of fine dust from each sample were assayed for HDM allergen Der p I using a monoclonal antibody enzyme linked immunosorbent assay (ELISA). The values for HDM allergen were positively skewed and the suitability of a log transformation was established by the resulting normal distribution and stable within-site variance.

RESULTS: The range of single determination (within which the true value lies with 95% certainty) was 3.1-fold for samples from the bed and 3.5-fold for samples from the floor. The coefficient of repeatability (the ratio beyond which a change between two estimates is established with 95% certainty) was 4.9 for the bed and 5.8 for the floor.

CONCLUSION: We estimate that, to detect a twofold difference or change in allergen levels, 35 houses per group will be required in cross-sectional studies and 30 houses per group in parallel-group, randomized controlled trials. We recommend that beds be sampled by collecting dust from the layer of bedding below the bottom sheet. A single site within the bedroom floor may be taken as representative of this site but this is not true for the living-room floor.