

Housing and health counselling: Preliminary results of a new medical referral system in France

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Abstract

Study objectives: Since 2002, a new unique service is available to physicians in southeast France. They may ask for a housing environmental inspection for their patients when they feel that the indoor environment has a negative influence on health status. This telephone survey was designed to evaluate the efficacy of this service.

Design: During this time period, 328 such housing environmental inspections have been performed. The protocol of these inspections included a detailed questionnaire and environmental sampling for mold identification, mite-allergen evaluation and, in selected cases, measurement of volatile organic compounds (VOC). Inspections were performed by trained technicians. From April to September 2005, we performed a telephone interview survey, using a structured questionnaire, to evaluate the reported outcome.

Results: Main defects identified in houses were mold infestation (44%), mite contamination (32%), and VOC exposure (9%) from new furniture, repairs performed and hobbies. Substantial repairs, including carpentry, wall floors and ceilings repairs, mold decontamination, and plumbing, had been performed in 59.4% of those houses. Full compliance, partial compliance, and no compliance by the occupant with the recommendations provided by the housing environmental inspectors were 50%, 20%, and 30%, respectively. Reasons for non-compliance included moving, time, and money constraints. When rating the efficacy of the service, total, almost total, and partial effectiveness was reported by the families to be 3%, 31%, and 56%, respectively.

Conclusion: This type of service holds great promise for patients as well as for physicians and should be investigated further by measuring physician-diagnosed health outcome and using cost–benefit analysis.

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1. Introduction

The relationships between allergenic exposure in sensitized patients and allergic symptoms on one hand (Platts-Mills et al., 1992; Clearing the Air: Asthma and Indoor Air

Exposures, 2000) and indoor dampness and health (Damp Indoor Spaces and Health, 2004) on the other hand are well documented. Thus allergenic avoidance is a first line recommendation in the management of these conditions (Masoli et al., 2004). However, the patient's compliance with recommendations is known to be far from perfect because the latter may be costly, disturbing or difficult to implement (Schonberger et al., 2004). To mitigate those difficulties, we have set up a new service for attending physicians. When they treat a patient whose condition is

Abbreviation: VOC, volatile organic compounds

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thought to be related to indoor environment, they may ask our housing environmental service to perform a home visit.

In this paper, we describe how our service is organized and provide the results of a survey based on a telephone interview. This paper reports the evaluation of changes in housing conditions following professional identification of housing-related health hazards. It did not consider the medical impact of such changes.

2. Material and methods

From March 2002 to March 2005, we performed 328 home visits at the request of the attending physicians, either a general practitioner or a specialist. All requests corresponded to patients with respiratory complaints whose condition worsened at home. The inspections are free of charge for the patient and the physician. The cost, which is in average equal to \$400.00 is supported by regional and local health authorities.

Following the reception of the request, our service set up an appointment with the family. A team of 2 technicians was then sent to the family house. These technicians have different educational backgrounds: chemistry, biology, risk assessment, architecture but received a 1-year training in our university related to housing hazards and their management. The visit included:

- a structured house inspection,
- a detailed and structured questionnaire about housing conditions and identified defects,
- sampling for house-dust mite-allergen semi-quantification (Acarex-test[®] Van der Brempt et al. (1991)), mold identification using the adhesive tape method (Porto, 1953), measurement of ambient and wall temperature and relative humidity. When the visual inspection or the smell suggested that a chemical pollutant could be present, we performed a measurement of indoor pollutants (volatile organic compounds (VOCs) and the group benzene-toluene-xylene) using a passive dosimeter (Radiello, Maugeri foundation, Verona, Italy) (Namiesnik et al., 2005) left in the house for 7 days.

After the visit, the family was given oral and written recommendations about desirable environmental changes. These changes could relate either to family behavior, such as mite avoidance measures or to more complicated alterations, such as works to be performed by a company.

Advices about mite avoidance was provided to the 68 families whose Acarex-test[®] was ++ (moderately positive) or +++ (strongly positive). They were listed on a pamphlet and included bed encasings, vacuum cleaning using an HEPA filter, laundry in water > 56 °C, removing dust reservoirs and increasing ventilation. Standard advices for mold avoidance made reference to the New York City Department of Health and Mental Hygiene Guideline on Assessment and Remediation on Fungi in Indoor Environments (2002). Cockroach avoidance included withdrawal of any crumb or food remains filling up wall cracks and using insect powder.

From April to September 2005, we performed the telephone interview survey. The interview used a structured questionnaire designed to evaluate which changes had occurred in housing conditions following the home visit.

3. Logistics

After a maximum of 4 phone calls, we sent a letter to family we could not reach. Twenty-two letters went back with the mention “does not live there”, meaning that the family had moved.

An additional 65 families did not answer but were not considered to have moved because the letter we sent them

did not go back. They were considered as non-respondents. Thus, the study group included 205 houses i.e., 62.5% of the target population and 67% of the subgroup who did not move.

4. Statistics

We received quantitative responses leading to descriptive statistics expressed as percentages. In some instances, we compared percentages using a chi-squared test. A difference was considered as statistically significant if *P*-value was less than 0.05.

5. Results

As one-third of the target population which did not move did not participate in the survey, one might question if a selection bias could occur. Actually, it seems unlikely because the mean age of the buildings, percentage of unhealthy building and mean number of recommendations provided to the family were very similar for dwellings of participants and non-participants. Home inspections were performed all the year around. Season was indeed a parameter relevant to indoor hazards: the percentage of mattresses with a strongly positive Acarex-test[®] was equal to 29.6% for visits performed from November to May and equal to 8.8% for visits performed from June to October ($P < 0.0001$). In like manner, the percentage of dwellings with obvious humidity was equal to 68% and 32%, respectively ($P < 0.0001$).

The mean number of recommendations provided per dwelling was equal to 1.8. A total of 28.8% of tenants got a single advice, 35.2% two advices, 21.0% three advices, and 15.0% more than three advices.

Moving: Among the 328 families, 44 (21.5%) had moved since the home visit. Reasons for moving were as follows: health complaints: 23 subjects (52%), personal motivation: 13 subjects (29%), litigation/eviction: 4 subjects (9.5%), other reasons: 4 subjects (9.5%). Thus, the study group included 205 families.

Defects: Defects identified are listed in Table 1. The main indoor health hazard consisted of mold contamination. Overall, 35 dwellings had high VOC levels, benzene in 11 instances, formaldehyde in 5 instances, toluene in 1 instance and total VOC in 31 instances. The sources of this increased VOC were set up following the visit: in 12 instances (34.3%) related to fiberboard furniture, in 11 instances (31.4%) to work implemented in the house (painting, paper-walls, carpets, wooden flooring), in 6 instances (17.1%) to hobbies and in 6 instances to other sources.

Repairs performed: Repairs performed following the visit appear in Table 2. Works have been performed in 59.4% of the houses. Stoneworks consisted in repairing (especially or building walls or dividing walls). Sanitation consisted in plumbing works in fitting water leakages or fixing a faulty shower.

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