

# **PUBLIC HOUSING PROGRAMS: POTENTIAL ENVIRONMENTAL HEALTH BENEFITS THROUGH INDOOR AIR QUALITY: A CASE STUDY IN SANTIAGO, CHILE**

**Soledad Burgos**, *School of Public Health, Faculty of Medicine, University of Chile, Santiago, Chile*

**Pablo Ruiz**, *School of Public Health School, University of Chile, Santiago, Chile*

**Rosalina Koifman**, *School of Public Health, Oswaldo Cruz Foundation (FIOCRUZ), Rio de Janeiro, Brazil*

**Background and Aims:** Housing interventions, as rehousing/relocation of families from deprived to improved houses, can impact public health through reducing several risk factors. One of the potential benefits of relocation, which have not been studied extensively, is the improvement of indoor air quality of the relocated families. The purpose of this study was to determine differences in indoor air quality between families living in slums and families relocated through a housing program, both living in a similar geographical area in Santiago, Chile, and identify likely determinants of this difference.

**Methods:** Using particulate matter  $PM_{2.5}$  as an indicator of indoor air quality, in this study we sampled 169 houses cross-sectionally: 98 relocated families and 71 families living in slum houses. In each home, indoor and outdoor 24-hour samples and questionnaire about home conditions were collected.

**Results:** Indoor  $PM_{2.5}$  concentrations inside slum homes were higher than in homes of relocated families ( $77.8 \mu\text{g}/\text{m}^3$  vs.  $55.7 \mu\text{g}/\text{m}^3$ ,  $p < 0.001$ ). A regression model was used to identify determinants of indoor  $PM_{2.5}$  concentrations. Outdoor  $PM_{2.5}$  was the main predictor of indoor  $PM_{2.5}$ , explaining 26.0% of the total variance of the model. Also significant were the type of fuel used to heat water and the number of indoor cigarettes smoked, which increased the indoor  $PM_{2.5}$ , and the presence of infants, which was a protective factor. The intervention itself – comparing slum homes with relocated homes in the model – significantly decreased indoor  $PM_{2.5}$ .

**Conclusions:** These results show that a housing program may improve indoor air quality which represents a clear health benefit.