

# Moisture and Mold Exposure in Homes of Older Adults in Bucaramanga, Colombia

Raquel Rivera Carvajal\*<sup>1</sup>, Diana Carolina Tiga Loza<sup>1,3</sup>, Beatriz Elena Guerra Sierra<sup>1</sup>, Doris Jimena Roncancio Benitez<sup>2</sup>, Laura Andrea Rodriguez Villamizar<sup>3</sup>, Gisela Alejandra Ríos Gajardo<sup>4</sup>

1. Doctorado en Enfermedades Infecciosas, Universidad de Santander, Bucaramanga, Colombia
2. Universidad el Bosque. Bogotá, Colombia
3. Universidad Industrial de Santander, Bucaramanga, Colombia
4. Universidad de Concepción. Chile

\*Author Correspondence: [raq.rivera@mail.udes.edu.co](mailto:raq.rivera@mail.udes.edu.co)

**Introduction:** Indoor exposure to moisture and mold constitutes a potential environmental health risk for older adults, who typically spend a significant portion of their time indoors. Evidence from case reports and experimental animal studies suggests that environmental mold exposure may be associated with adverse effects on the central nervous system.

**Objective:** To compare the extent of moisture and mold presence in the homes of older adults with and without mild cognitive impairment.

**Methodology:** Preliminary analysis of a case-control study involving 20 households inhabited by older adults, categorized by presence or absence of mild cognitive impairment. A semi-quantitative indicator of mold and moisture damage was generated using the *Dampness and Mold Assessment Tool – General Buildings (DMAT)*. Environmental parameters including relative humidity, temperature, and CO<sub>2</sub> concentration were measured. Additional instruments were applied to characterize participants, their residential environments, and prior exposures to molds through environmental and dietary routes. Group comparisons were conducted using Student's t-test, Mann–Whitney U test, and Fisher's exact test.

**Results:** The sample consisted of 10 cases and 10 controls, with 80.0% (n=16) being female and a mean age of  $74.85 \pm 9.18$  years. Regarding housing characteristics, 35.0% (n=7) lived in houses and 65.0% (n=13) in apartments, with a median area of 97.5 m<sup>2</sup> (IQR: 72–120). The median indoor temperature was 26.3°C (IQR: 24.8–27.8), relative humidity 61.9% (IQR: 59.95–63.65), and CO<sub>2</sub> concentration 508 ppm (IQR: 492–659.5). Median length of residence was 11 years (IQR: 5.5–19). The median mold and moisture damage indicator score was 5.5 (IQR: 1.5–10) in case homes versus 3.0 (IQR: 0–4) in control homes ( $p=0.2626$ ).

**Discussion:** Preliminary findings suggest a trend toward higher levels of moisture and mold damage in the homes of older adults with mild cognitive impairment, compared to controls.

Although not statistically significant, this trend highlights the need for studies with larger sample sizes to better assess potential associations.

**Conclusion:** A trend toward greater household moisture and mold exposure was observed among individuals with mild cognitive impairment. Expanding the study sample will enable more robust statistical analyses to better understand the relationship between environmental exposures and cognitive health in aging populations.

**Keywords:** Mild Cognitive Impairment; Molds; Residence Characteristics.

**Funding** Proyecto “Mohos Ambientales Intradomiciliarios y Deterioro Cognitivo Leve En Adultos Mayores. Bucaramanga – UNIRED Aciva2-004-24”