

Background

- Radon Exposure:** Radon is a naturally occurring gas and major lung cancer cause in non-smokers.
- Geographic Variability:** Radon levels vary due to factors like soil composition and building characteristics.
- Uncertainty in Cancer Association:** The link between radon and non-respiratory solid tumors remains uncertain.
- Impact in Lung Cancer:** Radon's influence on lung cancer profile remain unexplored.

Objective

To explore the link between **radon exposure** and **mortality from various solid tumors** in Spain, emphasizing potential associations in **young females** and **radon risk areas**.

Methods

- Data Source:** Analyzed mortality data from the National Mortality Registry (INE) for 1999-2021.
- Population:** Analyzed age-standardized death rates for residents in municipalities with over 10,000 inhabitants.
- Cancer Classification:** Used ICD-10 to categorize cancer types.
- Radon Risk:** Categorized radon exposure in Spain into high (≥ 301 Bq/m³), intermediate (201-300 Bq/m³), and low (≤ 200 Bq/m³) areas based on the Nuclear Safety Council's Rn Map.
- Statistical Analysis:** Employed Pearson correlation coefficients to examine associations between radon exposure and cancer mortality in young females.

References:

- Radon WHO Book 2009;
- <https://www.csn.es/mapa-del-potencial-de-radon-en-espana>

Visualization

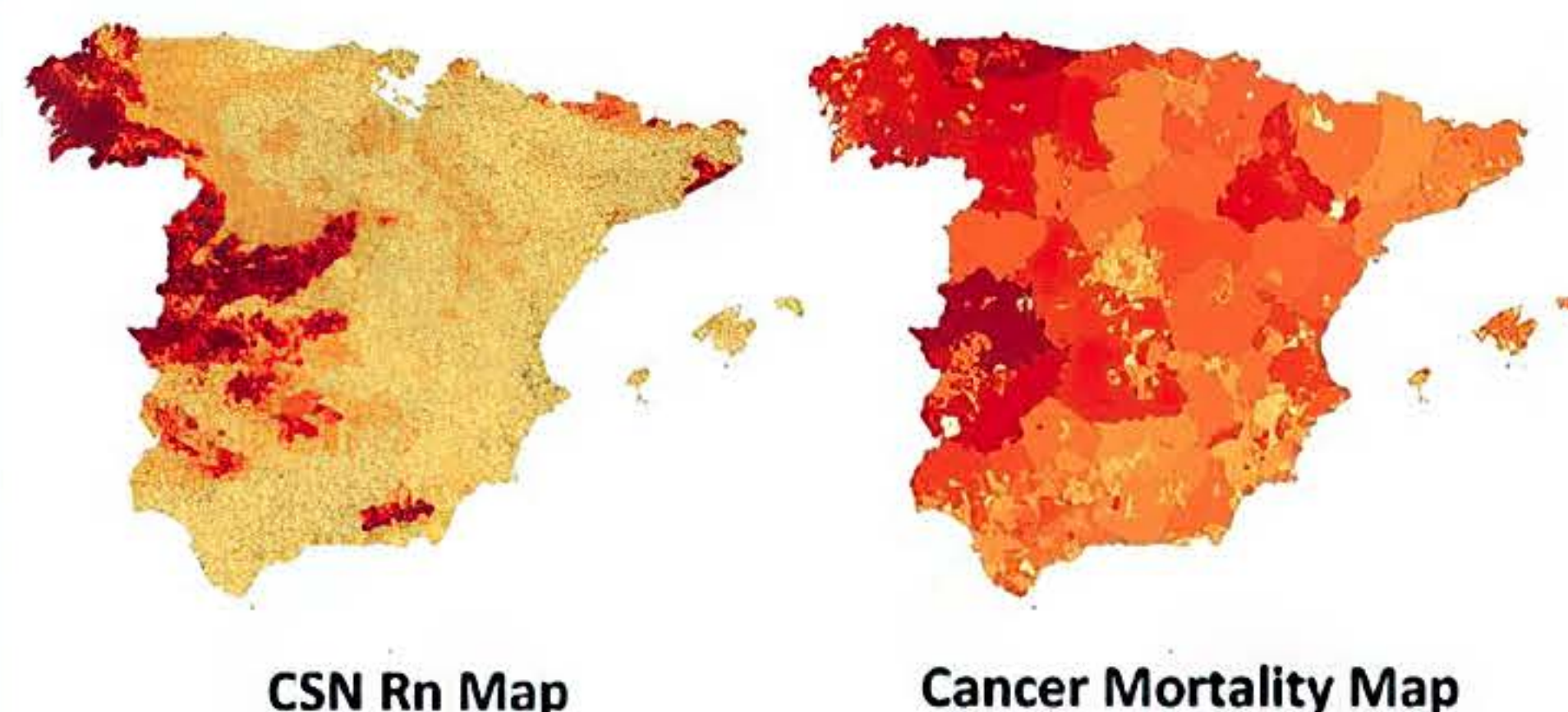


Figure 1. Geographic Distribution of Radon Exposure and Cancer Mortality in Spain. CSN (Consejo de Seguridad Nuclear)

	OVERALL Deaths N=9,140,258	CANCER Deaths N=2,351,989
Age (Range)		
> 50 years	8,607,199 (94.2%)	2,200,465 (93.6%)
≤ 50 years	533,059 (5.8%)	151,524 (6.4%)
Sex		
Male	4,710,369 (51.5%)	1,451,814 (61.7%)
Female	4,429,889 (48.5%)	900,175 (38.3%)
Histology		
Lung Cancer	468,525 (19.9%)	
Colon Cancer	244,457 (10.4%)	
Breast Cancer	143,126 (6.1%)	

Table 1. Demographic Characteristics and Cancer Mortality Distribution: Age, Sex, and Histology Overview

Results

- No consistent correlation** found between radon risk areas and overall cancer mortality, highlighting the complexity of radon's effects.

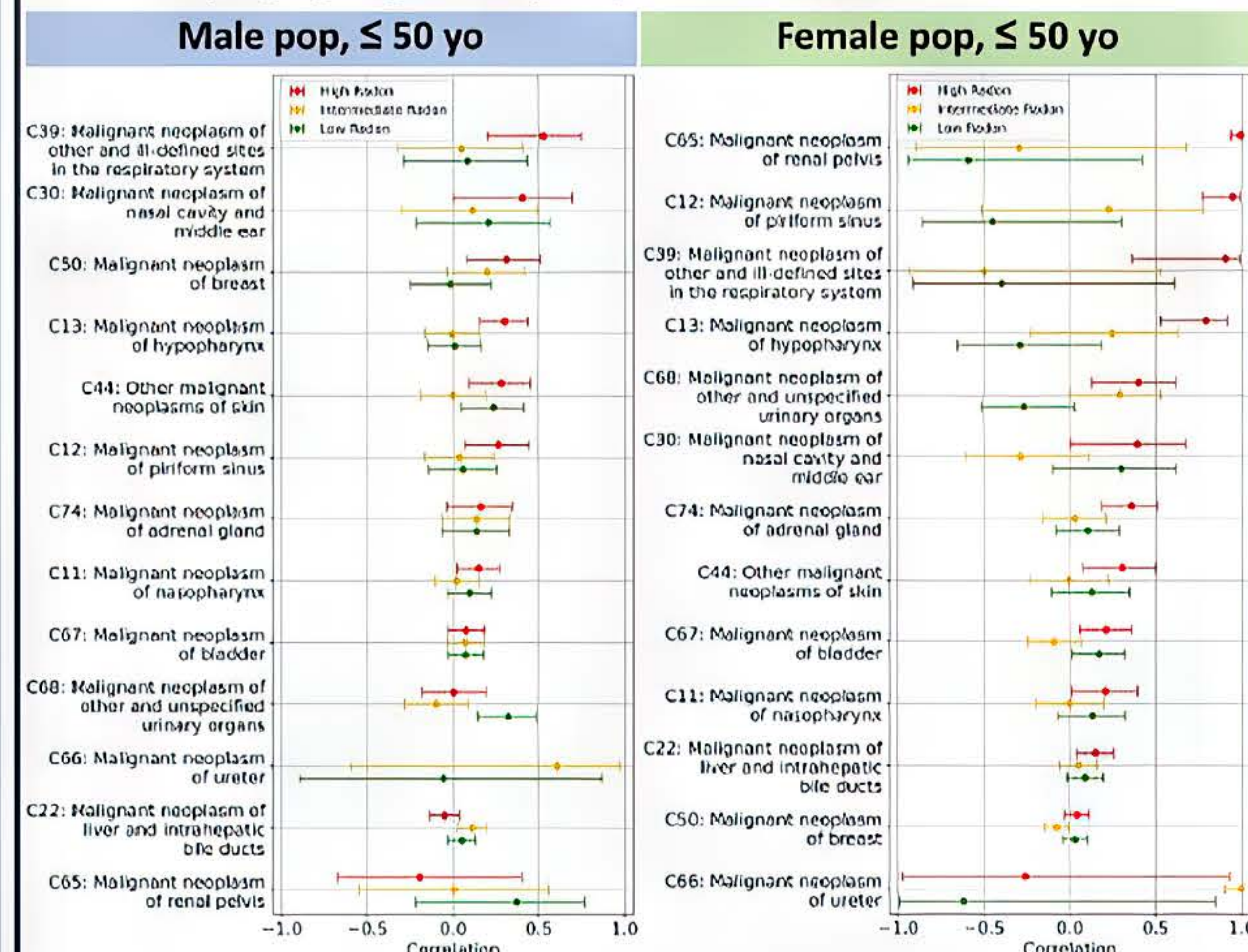


Figure 2. Correlation between Mortality Rates in Individuals ≤50 by Radon Exposure Levels: A) Males B) Females

Conclusions

- Young females** showed **significant mortality** associations with specific solid tumors in **high-radon areas** (Figure 2).
- Higher mortality** for certain cancers was more pronounced in **high radon risk areas**, emphasizing the potential role of local public health strategies.
- Further Investigation Needed:** Particularly in younger females.