



## Commentaries

## Commentary regarding “Residential radon and small cell lung cancer. A systematic review”



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## ABSTRACT

Rodríguez-Martínez et al. proposed a systematic review of residential radon and small cell lung cancer. Although this is a noteworthy project, it must utilize the complete set of radon data and provide a rigorous analysis of these data. The authors utilized a selected set of radon data, and do not utilize rigorous statistical methods in relating the effects of radon and small cell lung cancer. These limitations detract from the conclusions of the systematic review.

Rodríguez-Martínez et al. in their recently published systematic review “Residential radon and small cell lung cancer. A systematic review” have claimed that radon exposure increases the risk of small cell lung cancer (SCLC) [1]. They state that the rationale for selecting SCLC is due to this point that among different lung cancer histological types, SCLC is most closely linked with radon exposure. Although residential radon has always been an issue of interest for experts, the study conducted by Rodríguez-Martínez et al. is seriously flawed. Besides shortcomings in inclusion criteria (e.g. the key words used for retrieving information which possibly caused exclusion of some major studies), the authors have given different weights to characteristics such as sample size, number of small cell lung cancer cases, results adjusted by covariates, study design, and method of assessment of radon concentration. While 19 studies were excluded, among included studies there's a study with no information on statistical significance of the findings (its score is 6 out of 10). Regarding the shortcomings of the scoring method used in this study, the weight of “total sample size” for “50–100”, “101–500”, and “> 500” samples were 0, 1 and 2, respectively. It is clear that selection of weights should be supported by appropriate evidence. Given this consideration, authors have gotten whatever they wished by selecting special weights for different parameters. Moreover, the weights for the method of radon measurements for “not specified or charcoal” or “alpha track or other” were 0 and 1, respectively. It should be noted that radon measurement methods are

acceptable if properly performed. Although alpha track data provides an accurate representation since the detectors remain in place for an extended period, grab samples including charcoal canisters provide valid data if used under appropriate circumstances. The method selection depends on a variety of factors including ventilation characteristics, seasonal atmospheric variations, equilibrium factors, and selecting a representative location [2,3].

While residential radon is up to 31,000 Bq/m<sup>3</sup> in some radon prone areas in Ramsar [4], it is reported that the risk of lung cancer was lower in the areas with higher radon concentrations [5]. This finding is consistent with those reported by Cohen who found a hormetic dose response relationship for radon and lung cancer, rather than finding an linear-no threshold (LNT) type response [6,7]. In his study, to test the LNT theory, Cohen used data on lung cancer mortality rates versus mean radon concentration in homes for 1601 U.S. counties. With corrections for smoking, he showed a strong tendency for lung cancer rates to decrease with increasing radon exposure [6,7].

Moreover, considering the extremely tight association between smoking and small cell lung cancer, it is skeptical that radon will emerge as a true independent variable. Therefore, valid data collection about smoking is a key factor in radon and lung cancer studies. In Summary the authors have failed to:

1. Justify the choice of selected data and the basis for neglecting other

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data.

2. Provide a valid reason for selecting their weighting factors. We could not find any statistical test that would justify their weights or an approved methodology to suggest their weighting factors are credible.

#### Competing interests

Authors declare that they have no competing interests.

#### Conflicts of interest

None declared by the authors.

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