

# 34 percent of Galician secondary schools exceed maximum recommended radon levels

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Researchers from the University of Santiago de Compostela (USC) have analysed levels of radon, a natural radioactive gas, in 58 secondary schools in Galicia. The results show that 34% of these schools exceed the limit of 400 Bequerels/m<sup>3</sup> recommended by the European Union. Excessive inhalation of radon is associated with lung cancer.

"Out of all the secondary schools where samples were taken, 34% had radon levels in excess of 400 Bequerels/m<sup>3</sup> in some of their classrooms

or offices", Juan José Llerena, co-author of the study and a member of the USC's Radiation Analysis Laboratory, tells SINC. "In addition, 15% had some point where figures were in excess of  $800 \text{ Bq/m}^3$ ", warns the expert.

In order to carry out the study, which has been published recently in the *Journal of Environmental Radioactivity*, the team took 374 measurements using activated carbon canisters and other detectors (requiring both long and short periods of exposure) in 58 [secondary schools](#) in the four provinces of Galicia.

"Corrective measures must be put into place in Galicia as well as other regions of Spain, and the number of centres available to measure radon and extend these preventive measures and actions to nurseries and primary schools must also be increased", says another of the study's authors, Ignacio Durán, who is the group coordinator.

The [European Union](#) recommends maximum air radon levels of  $400 \text{ Bq/m}^3$  inside buildings. If this level is exceeded, actions should be taken to reduce it. This regulation applies to properties built before 1990. The recommended levels for those built after this date are  $200 \text{ Bq/m}^3$ .

The World Health Organisation goes even further, and has reduced the safe limit to  $100 \text{ Bq/m}^3$ , since a positive correlation has been found between the levels of this gas inside buildings and [lung cancer](#).

## **Measure and correct without causing panic**

The researchers' intention is not to alarm the population, but they say that corrective measures should be taken to reduce high radon levels, "which are fairly effective and cost relatively little if they are put into place during the construction of buildings".

These corrective actions range from more effective management of ventilation in buildings in the least serious cases right through to directly extracting the gas from the subsoil (before it manages to seep inside the premises) in cases where levels are higher. Radon filters in from the ground through cracks in the foundations, walls and the plumbing in bathrooms. Including architectural barriers that are impermeable to the gas are recommended in newly constructed buildings.

Llerena explains the process: "The first thing is to identify whether there is a problem. After this, detailed measurements will be taken to find out the entry points for the gas. On the basis of these data, suggestions will be made about whether simply to improve ventilation or to carry out more in-depth work, for example making the building gas-impermeable or draining radon from the subsoil before it can get into the building. Each building is a world unto itself".

The soils in Galicia have high potential for radon emission, since they overlie an area of fractured granite. Exposure to this natural radioactive element occurs, above all, as a result of inhaling it in poorly-ventilated premises, although it can also be ingested if it is present dissolved in water.

**More information:** J.J. Llerena, D. Cortina, I. Durán y R. Sorribas. "222Rn concentration in public secondary schools in Galicia (Spain)". Journal of Environmental Radioactivity 101 (11): 931-936, Nov 2010.

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