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INDOOR RADON GAS (^{222}Rn) IN FAMILY HOMES IN ALDAMA, CHIHUAHUA, MEXICO AND THE CORRELATION TO LUNG CANCER

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Abstract. The radon gas (^{222}Rn) has no smell, color or taste and, currently, it is known to be carcinogen which causes lung cancer. The municipality of Aldama in Chihuahua possesses high natural uranium levels and therefore, it was hypothesized that high radon levels are present because this gas is byproduct of uranium decay. The objective of this study was to quantify the radon levels exposure to people in their homes; this is important, since for most people, the greatest acquaintance transpires in their homes. The ^{222}Rn concentration was measured in 12 Aldama city´s homes during 3 complete days. The owners agreed to participate in the study. The ^{222}Rn was measured with a portable AlphaGuard device (Professional Radon Monitor, Genicron Instruments GmbH), which was placed in a bedroom of each home at a high of 0.74 m. This device has the advantage of being highly efficient and able to quantify gas in Becquerels (Bq m^{-3}), with readings every 10 min. In addition, ambient temperature (AT), air pressure (AP) and relative humidity (RH) were also measured every 10 min. The results showed that Aldama´s residents are breathing in an environment that exceeds the maximum permissible limits of radon gas (USA-148 Bq m^{-3}). It was also noted that this effect is higher at night being above maximum permissible levels suggested by the International Atomic Energy Agency of the United Nations (< 200 Bq m^{-3}). Most residents in the area have a history of lung problems in their families but it was difficult to detect a strong correlation of ^{222}Rn with lung cancer. Strengthened actions should be taken by federal, state-government and municipality authorities to prevent and to lower the impacts of radon gas in human settlements.

Key Words: miner disease, natural uranium, Chihuahua, Mexico

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