



## ON THE DEVELOPMENT OF A METHODOLOGY FOR STUDYING THE SYNERGIC EFFECT OF RADON AND SMOKING ON THE OCCURRENCE OF LUNG CANCER

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**Introduction.** Lung cancer is currently the leading cause of cancer-related death worldwide and tobacco smoking is the most important risk factor for its occurrence. Recent research suggests that lung cancer in never-smokers could be a different disease than lung cancer in smokers, since different molecular pathways are present in never-smokers' lung cancer. Residential radon exposure is the second risk factor of lung cancer after tobacco smoking and the first risk factor for never-smokers. The problem of assessing the relationship between residential radon and lung cancer is the low variability in radon concentrations, as well as its weak linear relationship with smoking, hence being difficult to estimate possible dose-response patterns. Some studies, performed in Europe and North America, include risk communication/questionnaire and case-control studies on that issue. A review and a synthetic analysis of specialized literature served as the basis for a methodology design aimed to study the synergism of radon and smoking in the occurrence of lung cancer in the Republic of Moldova.

**Material and methods.** The study of the international experience on the methodology of the synergism between radon and smoking was carried out by searching 30 different current publications, published over the last 10 years on ResearchGate, Pubmed, BioMedCentral, RSCI, European Commission Webgate, WHO publications, etc. A descriptive synthesis of current approaches to the development and implementation of research methods for the synergistic impact of radon and smoking on lung cancer was performed.

**Results.** To date, a few research have focused on the study of the effect of synergistic exposure to smoke and radon on lung cancer incidence. A review of the specialized literature showed that the main methods for studying this phenomenon are case-control studies and sociological methods by raising public awareness, free testing and subsequent interviewing the risk groups. A combination of the approaches based on the successful experience of Spanish researchers, allowed to develop a questionnaire for the case-control study of patients with lung cancer. It includes 15 questions (related to sociodemographic, shelter, smoking, measuring radon, and diagnosis issues), hence suggesting being used within a long-term study along with the Institute of Oncology, followed by the subsequent database creation and the statistical processing of the obtained materials. The reliable statistical data on the relationship of the synergism of exposure to radon and smoking will allow to quantify and qualify the combination of these risk factors for the lung cancer incidence across our country.

**Conclusions.** The methodological approach designed to study the synergism of radon and smoking on the lung cancer incidence, based on the international experience and its application in Moldova will contribute significantly to this little-studied research area, as well as allow the public health system to develop the appropriate preventive means. There is a need to provide strategic guidance on what the synergistic approach to radon and tobacco control entails.