

A Fuzzy Inference Tool for Assessing Cancer Risk from Radiation Exposure

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Abstract : Ionizing radiation exposure is an established cancer risk factor. Compared to other common environmental carcinogens, it is relatively easy to determine organ-specific radiation dose and, as a result, radiation dose-response relationships tend to be highly quantified. Nevertheless, there can be considerable uncertainty about questions of radiation-related cancer risk as they apply to risk protection and public policy, and the interpretations of interested parties can differ from one person to another. Examples of tools used in the analysis of the risk of developing cancer due to radiation are characterized by uncertainty. These uncertainties are related to the history of exposure and different assumptions involved in the calculation. We believe that the results of statistical calculations are characterized by uncertainty and imprecision. Having regard to the physiological variation from one person to another. In this study, we develop a tool based on fuzzy logic inference. As fuzzy logic deals with imprecise and uncertain, its application in this area is adequate. We propose a fuzzy system with three input variables (age, sex and body attainable cancer). The output variable expresses the risk of infringement rate of each organ. A base rule is established from recorded actual data. After successful simulation, this will instantly predict the risk of infringement rate of each body following chronic exposure to 0.1 Gy.

Keywords : radiation exposure, cancer, modeling, fuzzy logic

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