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Original

Reevaluation of Time Spent Indoors Used for Exposure Dose Assessment

Katsumi HIROSE[1*] and Kenzo FUJIMOTO[2]

[1]Sophia University (7-1, Kioi-cho, Chiyoda, Tokyo 102-0094, Japan)
[2]Former National Institute of Radiological Sciences (4-9-1, Anagawa, Inage, Chiba 263-8555, Japan)

Summary

A time spent indoors of sixteen hours per day (indoor occupancy factor: 0.67) has been used to assess the radiation dose of residents who spend daily life in the area contaminated due to the nuclear accident in Japan. However, much longer time is considered to be spent indoors for recent modern life. United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) has been used an indoor occupancy factor of 0.8 since 1977 and a few reports suggested much higher indoor occupancy factors. Therefore it is important to reevaluate the indoor occupancy factor using current available survey data in Japan, such as 'NHK 2010 National Time Use Survey' and 'Survey on Time Use and Leisure Activities' of Statistics Bureau with certain assumption of time spent indoors in each daily activity. The total time spent indoors in a day is calculated to be 20.2 hours and its indoor occupancy factor is 0.84. Much lower indoor occupancy factors were derived from the survey data by Statistics Bureau for 10 to 14 and 15 to 19 years old groups and farmers who spend most of their time outdoors although present estimated indoor occupancy factor of 0.84 is still lower than those found in some of the relevant reports. A rounded indoor occupancy factor of 0.80 might be the appropriate conservative reference value to be used for the dose estimation of people who live in radioactively contaminated areas and for other relevant purposes of exposure assessment, taken into consideration the present results and values reported in United States Environmental Protection Agency (US EPA) and UNSCEAR.

Key Words: Time spent indoors, Indoor occupancy factor, Dose assessment, Nuclear emergency, Daily activity