

## **Influence of chimney effect on the radon effective dose of the lung simulated for radon prone areas of Ramsar in winter season**

### **ABSTRACT**

One of the well-known radon prone areas of the world is Ramsar in Iran, which is surrounded by the Alborz Mountain in its southern part and Caspian Sea on the north. The annual effective dose in the district of Talesh-Mahalleh is higher than the annual dose limits for radiation workers. In this study, the indoor radon level and effective dose of the lung were estimated using a Prassi portable radon gas survey meter in a model house containing top soil samples from different parts of Ramsar. For the extremely hot samples, the effective dose of the lung in winter season was  $27.75 \pm 2.55 \text{mSv}$ , when the windows and exhaust part of chimney were closed. However, when the chimney was turned on and the exhaust part of chimney was open, the effective dose of the lung was reduced to  $1.27 \pm 0.23 \text{mSv}$ . Also the seasonal radon effective doses of the lung with other samples were reduced to low values. The results suggest by using chimney effect and chimney heaters a significant lessening of the radon seasonal effective dose in dwellings of Ramsar can be achieved.

**Keyword:** Radon gas; Seasonal effective dose; Chimney effect; Ramsar; Iran