Reviewer's report

Title: Incidence of cancer among residents of high temperature geothermal areas in Iceland: A census based study 1981 to 2010

Version: 3 Date: 11 September 2012

Reviewer: Suminori Akiba

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In response to my comment, authors responded as follows:

“Concerning skin cancer (BCC) we do not state that the indoor air Rn is the cause,” and “Concerning breast cancer similarly we do not state that Rn exposure is the cause of this cancer”.

Even so, they concluded as follows: “The significant excess risk of breast cancer, and basal cell carcinoma of the skin, and the suggested excess risk of other radiation-sensitive cancers, calls for measurement of radon concentration. ”

I do not know why authors call for measurement of radon concentrations even though they do not suspect the involvement of radon in the observed increase of cancers of the breast and basal carcinoma of the skin. If authors suspect the involvement of radon in the excess of other radiation-related cancer risk, they should present a plausible mechanism as to how indoor radon gas gave larger doses to the target organs of those malignancies than to the lung (I am afraid that inhalation of radon gas give much smaller doses to the target cells of bone cancer, lymphoid and hematopoietic cancer and non-Hodgkin´s lymphoma than to the lung.)

If authors raise various possible causes for the observed excess, and radon exposure is one of them, that seems acceptable to me. – By the way, if radiation exposure is involved in the observed excess of cancer risk, gamma ray exposure from Tn series, rather than exposure to alpha particles from Rn series, may be involved.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests.