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LETTER TO THE EDITOR

Reply to ‘Comment on: Baaken D, Hammer GP, Seidenbusch MC, Schneider K, Spix C, Blettner M, Pokora R and Lorenz E 2019 Second follow-up of a German cohort on childhood cancer after exposure to postnatal diagnostic x-ray *J. Radiol. Prot.* 39 1074–91’

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To the Editor:

We welcome the comments by Schmitz-Feuerhake on our study on childhood cancer after exposure to postnatal diagnostic x-ray [1] and the opportunity to explain some points in more detail.

First, she comments on the interpretation of our results in comparison with the initial follow-up of the cohort and in regard to the LNT-assumption. Our extended follow-up does confirm the initial null findings observed in a cohort of children exposed to postnatal diagnostic x-ray by Hammer *et al* [2], which showed a standardised incidence ratio for childhood cancer of 0.99 (95% confidence interval: 0.79–1.22). We did not interpret our findings in the light of the LNT-assumption. Our study does neither confirm nor contradict it. However, we believe that

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this cohort offers a good opportunity to study the effects of very low doses observed among children <15 years.

Secondly, it was suggested to take background radiation and additional unknown contributions by life-style factors like holidays in Alpine regions into account. It can be assumed that background radiation is very similar for children in this cohort as the included children originate from the same catchment area [3]. We discussed the issue of underestimation of the individual doses by not including all potential sources of radiation exposure in our paper.

Thirdly, a comment on the use of individual organ doses instead of mean effective doses for risk analysis of diagnostic x-ray was stated. We did not use effective dose for all our dose-response analyses. We used red bone marrow dose for estimating the leukemia risk and dose to the brain for tumors of the central nervous system. Furthermore, we did not use mean doses but individual doses for all dose-response analyses.

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[2] Hammer G P, Seidenbusch M C, Schneider K, Regulla D F, Zeeb H, Spix C and Blettner M 2009 A cohort study of childhood cancer incidence after postnatal diagnostic x-ray exposure *Radiat. Res.* **171** 504–12

[3] Spix C, Grosche B, Bleher M, Kaatsch P, Scholz-Kreisel P and Blettner M 2017 Background gamma radiation and childhood cancer in Germany: an ecological study *Radiat. Environ. Biophys.* **56** 127–38