ICRP
International Commission on Radiological Protection

Task Group 90: Age-Dependent Dose Coefficients for External Exposures to Environmental Sources

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Annals of the ICRP

ICRP PUBLICATION 14X

Dose Coefficients for External Exposures to
Environmental Sources

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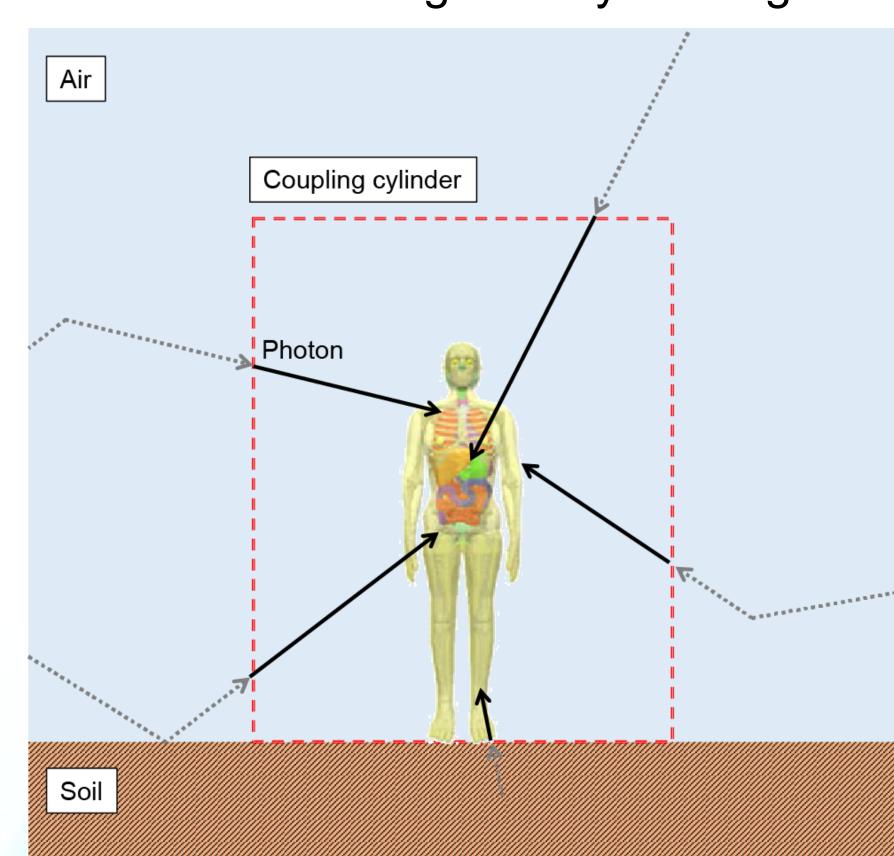H. Schlattl, Y.S. Yeom, S.J. Yoo

PUBLISHED FOR

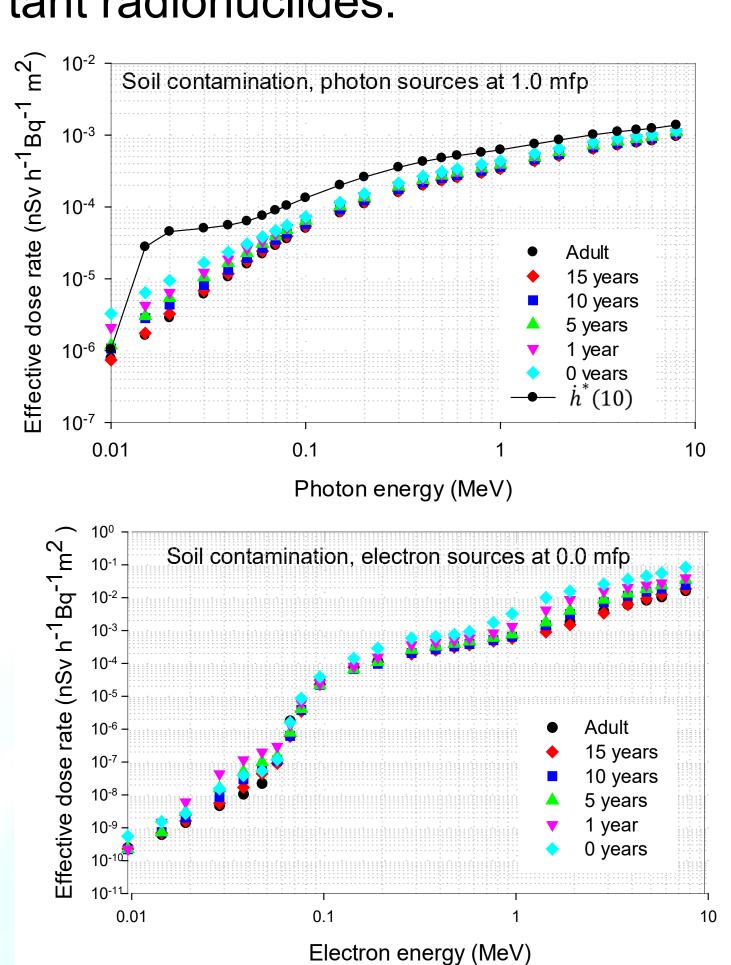The International Commission on Radiological Protection

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Publication will appear beginning 2020

MAIN POINTS

- Reference organ and effective dose rate coefficients are provided for external exposures of members of the public resulting from radionuclide contamination of **soil, water** and **air**. The source profiles for soil contamination include planar sources at various **specific depths** and **exponential volumetric sources** at different relaxation masses per unit area.

- The calculations require **modelling of the environmental radiation fields, computation of organ and effective dose rate coefficients for exposures to monoenergetic photons and electrons,** and the use of these data to **calculate doses rate coefficients for radionuclides**, considering their emissions of gamma rays, conversion electrons, x-rays, Auger electrons and bremsstrahlung x-rays. Extensive quality assurance was undertaken for all steps of the calculations.

- The report includes **organ and effective dose** rate coefficients for exposures to radionuclides for the ICRP reference **newborn, 1-year-old, 5-year-old, 10-year-old, 15-year-old, and adult. Ambient dose equivalent** and **air kerma rates** are also given for both soil contamination and air submersion.

- The data show that the **smaller body mass** of young children will result **in higher dose rate coefficients** due to smaller masses of overlying tissues shielding doses to internal organs and increased proximity to the source in the case of soil contamination. However, age-related differences in effective dose rate coefficients are generally not large for important radionuclides.

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