

Radiation Health Committee

Statement on new radon dose coefficients: implications for worker dose assessments

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Radon is a naturally occurring radioactive gas. Radon levels outdoors are typically very low but can be higher in buildings, including homes and workplaces, and especially underground such as in tourist caves and mines. While tobacco smoking remains the main cause of lung cancer, long-term exposure to radon can also lead to lung cancer (WHO 2017). The International Commission on Radiological Protection (ICRP) makes recommendations for protection of people against exposure to radon at home and at work.

The ICRP has re-evaluated its estimates of lung cancer risk from inhalation of radon progeny and approximately doubled its risk estimate (ICRP 2010). In *Publication 137, Occupational Intakes of Radionuclides: Part 3* (OIR Part 3; ICRP 2018), ICRP has published new dose coefficients for radon progeny. The ICRP has based this revision on a dosimetric approach, similar to the approach used for all other radionuclides. The new dose coefficients are consistent with the estimates of lung cancer risk.

Although protection against radon is primarily based on measurement and control of levels of exposure, dose estimates are required in certain situations for workers.

For the calculation of doses following inhalation of radon and radon progeny in mines and most buildings, the ICRP recommends a dose coefficient of 3 mSv per mJ h m⁻³ (approximately 10 mSv per working level month (WLM)). The ICRP considers this dose coefficient to be applicable to the majority of circumstances with no adjustment for aerosol characteristics.

For indoor workplaces where workers are engaged in physical activities, and for workers in tourist caves, the Commission recommends a dose coefficient of 6 mSv per mJ h m⁻³ (approximately 20 mSv per WLM).

The Radiation Health Committee recommends the application of the new ICRP dose coefficients when assessing radon and radon progeny exposures of workers in Australia.

In cases where aerosol characteristics are significantly different from typical conditions and reliable aerosol data are available, it is possible to calculate site-specific dose coefficients using the data provided in Annexes of ICRP OIR Part 3. If estimates of worker doses warrant more detailed assessment, the use of site-specific dose coefficients may be considered by the operator based on best available technical information in consultation with the relevant radiation regulatory authority.

The over-all risk for lung cancer from radon in the Australian workers is very small. However, the majority of radon-related lung cancer deaths occur among smokers. From a health perspective the best way of reducing the total lung cancer risk, as well as the lung cancer risk from exposure to radon, is to not smoke tobacco.

References

International Commission on Radiological Protection (ICRP) 2018. *Occupational Radionuclide Intakes Part 3*, ICRP Publication 137.

International Commission on Radiological Protection (ICRP) 2010. *Lung Cancer Risk from Radon and Progeny and Statement on Radon*, ICRP Publication 115.

World Health Organization (WHO) 2017. Preventing non-communicable diseases (NCDs) by reducing environmental risk factors. World Health Organization, Geneva.