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To cite this article: 2004 J. Radiol. Prot. 24 327

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News and information

Risks of non-cancer disease incidence and mortality in the Japanese atomic bomb survivors

One of the more intriguing findings to emerge over the last decade in the Japanese atomic bomb survivors Life Span Study (LSS) cohort has been the radiation-associated increases of non-cancer mortality, in particular cardiovascular disease, stroke, digestive and respiratory disease (Preston et al 2003). Of interest in this connection is the recent analysis by Yamada et al (2004) of non-cancer morbidity in the parallel Adult Health Study (AHS). This report assesses non-cancer disease incidence for 10,339 survivors over the period 1958–1998, representing a further 12 years of follow-up on this group from the previous analysis of Wong et al (1994).

In addition to the statistically significant positive dose-response relationships detected previously for the incidence of thyroid disease, chronic liver disease and cirrhosis, and uterine myoma (Wong et al 1994), all of which remain statistically significant in the current follow-up (two-sided \( p < 0.001 \) in all cases), Yamada et al found a significant positive dose response for cataract (two-sided \( p = 0.026 \)) and hypertension (two-sided \( p = 0.028 \)); among those exposed under the age of 40 there was a dose-related increase in myocardial infarction (two-sided \( p = 0.049 \)). There was also a positive dose response for calculus of the kidney and ureter at borderline levels of statistical significance (\( p = 0.07 \)), which was statistically significant for men (two-sided \( p < 0.05 \)). In general, adjusting for smoking and drinking in the analyses (by stratifying on these variables) did not alter the statistical significance of these results. The novel findings in relation to cataract incidence confirm previous findings of radiation-associated increases in prevalence of cataract in the AHS (Choshi et al 1983, Minamoto et al 2004) and in other radiation-exposed groups (Hall et al 1999). The radiation-associated increases in myocardial infarction are also consistent with the cardiovascular mortality findings in the LSS (Preston et al 2003) and in other cohorts (Darby et al 2003); the findings with respect to chronic liver disease and cirrhosis are partly supported by the latest LSS mortality findings, in which there was also a suggestive, but statistically non-significant, radiation-associated increase in deaths due to liver cirrhosis (Preston et al 2003).

What are the mechanisms for these radiation-associated increases, assuming that they represent causal relations? At present it is not clear, although various hypotheses have been advanced by Yamada et al and others. Whatever the mechanisms, it is anticipated that over the remainder of follow-up the total number of radiation-associated non-cancer deaths may approach those for radiation-induced cancer (Preston et al 2003). However, because 48% of the survivors are still alive, there remain major uncertainties in the pattern of expression of risk across the lifespan, and also in the shape of the dose response (Preston et al 2003). It is anticipated that about 50% of the radiation-associated non-cancer deaths are yet to occur in...
the LSS (Preston et al 2003). Given these perspectives, continued follow-up of the LSS and the AHS for non-cancer morbidity and mortality over the next 20–30 years is of the highest scientific and public health importance.

References


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ICRP Recommendations: consultation on the next fundamental ICRP Recommendations

A next set of fundamental ICRP Recommendations, intended to replace the 1990 Recommendations in ICRP Publication 60, is now being prepared after several years of preparatory work. ICRP has presented a number of iterations of conceptual ideas for these Recommendations, including articles published in this journal, and has received much helpful input and many useful comments on these concepts. Based on those discussions, the Commission has now presented a draft text of the 2005 ICRP Recommendations for consultation. The draft text can be found at http://www.icrp.org/docs/2005_recsCONSULTATION_Draft1a.pdf. The consultation period will end 31 December 2004.

In view of the importance of the discussion about this draft, and in response to requests received, the consultation comments will be posted publicly at the ICRP web-site (http://www.icrp.org/). For practical reasons, this means that comments on the document must be submitted through the ICRP web-site.

Risk and precaution

NRPB has published a report (Radiation, Risk and Society Advisory Group 2004 Doc. NRPB 15 (4) 1–13 (http://www.nrpbp.org/publications/documents_of_nrpbp/abstracts/absd15-4.htm)) of a seminar that examined important terms used to communicate risk to the public, in particular the precautionary approach and the precautionary principle. The report examines the role of scientists and experts in assessing risks and the role of authorities managing the risks. The
public demands that organisations involved in assessing risks should be open, transparent and impartial. If this is not achieved, public trust in advice on risks can be undermined significantly.

Precaution in everyday life is usually determined by intuition, experience and observing the behaviour of others. A precautionary approach and the precautionary principle have more specific meanings but are sometimes confused with each other, and with everyday precaution. It would be better to reserve these terms for their more specific meanings in the worlds of science and politics.

Scientists use a precautionary approach when interpreting experimental evidence for risks of harm and when they convert these data into advice on acceptable levels of public or occupational exposure. If the necessary information is uncertain or has to be inferred from experimental data, significant additional caution is needed in setting guidelines or limits. This use of precaution by scientists in assessing risks from radiation and other agents, including chemicals, is not widely known or appreciated.

The precautionary principle is a political term for decisions on preventive action when the scientific evidence is not clear enough for a detailed risk assessment. If the level of harm and the likelihood of occurrence were well known, then a precautionary approach suffices because the government and public can base decisions on evidence. If the level and the likelihood of a risk is not certain, then scientists should advise on the hazards, assess the available evidence of harm, advise on whether and how to apply the precautionary principle and then do research to enable a more reliable assessment of the risks.

The report also examines the various definitions of the word ‘safe’, the role of scientists and experts in assessing risks, the role of public authorities and the need for organisations like NRPB to be open, transparent and impartial. Some practical advice is given on how to ensure that organisations are open.