Assessment of cancer risks comes under attack

EXTRAPOLATING downwards from the effects of exposure to high levels of ionising radiation is an inadequate basis for predicting the dose-response relationship for the incidence of cancer at low levels of exposure, according to Dr Alice Stewart, of the Department of Social Medicine at Birmingham University, England. Such extrapolation would only be valid if cancer was the sole effect of radiation. However there were other indirect effects which would be hidden by the high-dose data, but which would make a linear dose-response relationship untenable, Dr Stewart told a session on epidemiology studies of low-level radiation exposure.

Recent analysis of medical data collected on workers at the US Government's nuclear facilities at Hanford in Washington State, and therefore based solely on low levels of exposure, indicated that a curvilinear model for the dose-response relationship was better than a linear model. The best fit was given by a curve in which the response was proportional to the square root of the dose.

Dr Stewart said medical considerations raised questions about using data based on survivors of the atomic bomb explosions at Hiroshima and Nagasaki as a basis for predicting the effects of low-level exposure to ionising radiation. "Claims that the mortality of A-bomb survivors between 1950 and 1974 from diseases other than cancer is unrelated to ionising radiation gave a false impression. This was due partly to the fact that direct and indirect effects of radiation delivered at high dose-rates had similar consequences, and partly to the ease with which other diseases could prevent cancer induction by radiation—or other carcinogens—from developing into clinical cancer".

Prevention at this stage was usually the result of a non-cancer death coinciding with a period of cancer latency. "Optimal conditions for observing cancer effects of radiation are therefore those which combined low rates of general mortality with small doses of radiation delivered at slow dose rates."

Dr Stewart said that these were the conditions surrounding data collected by Dr Thomas Mancuso, of the University of Pittsburgh, on the health of workers at the Hanford plant, which have recently caused considerable controversy by raising serious doubts about the adequacy of current protection measures.

Mr George Kneale, a Birmingham University statistician who has been helping Dr Stewart to analyse Dr Mancuso's results, told the session that the most recent analysis of the data provided a doubling-dose for the incidence of radiation-linked cancers of between 2 and 150 rads, whereas calculations based on a linear extrapolation from data on A-bomb survivors indicated a doubling-dose of between 150 and 200 rads. "On internal evidence the Hanford survey rejects the possibility that the true risk may be as low as it seems from the A-bomb survivors, but we cannot say precisely what the true risk is, apart from the fact that it appears to be higher at low doses than extrapolation downwards from high doses would indicate."

Doubts about the validity of conclusions of epidemiological surveys based on relatively small sample data were raised by Dr Charles E. Land, of the National Cancer Institute's environmental epidemiology branch. Dr Land warned that an inadequate sample size severely reduced the chances of correctly rejecting a false hypothesis of no dose effect at low levels of exposure. "Failure to reject is not strong evidence for the null hypothesis, so the study results are likely to be inconclusive—a wasted effort", he said.

"We do not have the resources for adequate epidemiological studies of populations exposed to low levels of radiation, and if we should try to do them anyway we would run considerable risk of obtaining misleading results, results that would derive at least some credibility from the vast effort of obtaining them," he said. □

Meanwhile, back in Washington . . .

DNA critics appointed to advisory committee

Two active participants in recent debates over the adequacy of guidelines for research using recombinant DNA techniques have been appointed to the committee responsible for advising the director of the National Institutes of Health on a number of important aspects of such research.

The two—Dr Richard Goldstein, assistant professor of microbiology and molecular genetics at Harvard Medical School, and Dr Sheldon Krimsky, acting director of the program in urban, social and environmental policy at Tufts University—are among 14 new members appointed to the Department of Health, Education and Welfare's Recombinant DNA Advisory Committee by HEW Secretary Joseph A. Califano.

The appointments follow Mr Califano's announcement last month of a number of changes to existing arrangements for regulating recombinant DNA research. The advisory committee is responsible for giving advice on new types of bacteria for use in such research, on whether certain presently prohibited experiments should be conducted, whether additional categories of research should be exempted from the guidelines, and on possible future changes in the guidelines.

Mr Califano also announced that the size of the advisory committee was to be increased to 25, and that the scope of its membership was to be extended to give greater weight to non-scientific representation. The new members of the committee include a professor of education, a professor of law, a prominent environmentalist and a laboratory technician.

In addition to Dr Goldstein and Dr Krimsky, the new members include: Dr Karim Ahmed, senior staff scientist with the Natural Resources Defense Council; Zelma Cason, chief of cytotechnology in the department of cytology at the University of Mississippi Medical Center; Patricia King, professor of law at Georgetown University Law Center in Washington; Dr Samuel Proctor, professor of education at Rutgers University; and Ray Thornton, retiring member of the US House of Representatives and chairman of the House subcommittee on science, research and technology in the last Congress.

The new scientific and medical members are: Dr David Baltimore, (MIT); Dr Francis Broadbent (University of California, Davis); Dr Richard Novick (New York Public Health Research Institute); Dr David Parkinson, (University of Pittsburgh); Dr Damon Pinon, (University of California); Dr Luther Williams (Purdue University); and Dr Frank Young (University of Rochester).

There is thought to have been considerable controversy over some of the other names of "public interest" representatives suggested for possible membership of the committee, particularly since some scientists involved in the research felt that too large a non-technical component might impede the committee's functioning. □

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