

# Compensating Radiation Victims

*"Ultimately, our society is unlikely to tolerate a situation in which harm is continuously suggested but recompense is provided no one."*

Ronald Preston, science adviser to  
the Senate Labor and Human Resources Committee,  
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By JANET RALOFF

There's little doubt that radiation can cause cancer. For an individual, however, the link between a given radiation exposure and subsequent development of a cancer can only be drawn statistically. That's because, to the physician, a radiation-induced cancer is indistinguishable from a cancer caused by workplace chemicals, by natural toxins, or possibly even by defective genes. Given that, how can anyone ever prove that his or her cancer results from one or more exposures to some environmental agent such as radiation — particularly if that cancer doesn't show up until 20 or 30 years after the initiating event?

It's a dilemma currently confronting a number of prominent policymakers, risk-assessment analysts, health physicists and statisticians. Moreover, the question is hardly academic. Notes Sen. Orrin Hatch (R-Utah), "Even the Department of Defense now admits that people developed cancer from the nuclear fallout" generated in above-ground weapons tests. Since many of Hatch's constituents not only lived downwind of the Nevada Test Site when the U.S. conducted above-ground tests there from 1951 to 1962, but now also complain of being plagued by an epidemic of cancers, Hatch has taken a very personal interest in the dilemma and its resolution.

Which explains the genesis of S-921 — a bill Hatch introduced this year to create a Radiogenic Cancer Compensation Act. Though Hatch's bill is aimed at aiding victims of the government's above-ground nuclear tests, the "probability-of-causation" philosophy upon which it is based could some day be applied just as readily to assessing the merit of claims for injury from many other agents, such as workplace chemicals, prescription drugs or indoor-air pollutants.

The cancer compensation act would contain "two major innovations that are absolutely necessary if the courts are to provide proper relief for fallout victims," Hatch says. The first would be the requirement that the merit of any claim of compensable injury be judged using radioepidemiological tables and formulas now under development by the National Institutes of Health (NIH). The bill's second controversial proviso is that compensa-

tion may be awarded plaintiffs whose probability of having been harmed by fallout is less than 50 percent.

The Orphan Drug Act, signed into law Jan. 4, 1983, requires that the Department of Health and Human Services (HHS) develop tables by Jan. 4, 1984 — based on the best scientific assessments — of the probabilities that various cancers might be caused by various doses of ionizing radiation. A committee convened by NIH will develop the tables, drawing from the many epidemiological studies of populations that have received radiation exposures — in medicine (as in diagnostic x-rays), the workplace (as in uranium mines), in Hiroshima and Nagasaki bomb survivors, and in laboratory accidents.

Under the act, any plaintiff able to establish a 50-percent probability (the current standard of proof for American legal torts) of having a fallout-generated cancer would receive actual damages up to a maximum of \$500,000 from the federal government. It is expected, however, that most people who have developed cancer from fallout will be unable to meet the 50-percent figure (either because their exposures cannot be estimated or because the cancer they develop is too common to rule out a reasonable expectation that it results from something else).

Plaintiffs with probabilities of causation between 10 and 50 percent would be entitled to actual damages up to the product of their probability times \$500,000. For instance, someone with a 10 percent probability of causation would qualify for an award of up to 10 percent of \$500,000 — or a total of \$50,000. Those with a probability below 10 percent would receive nothing.

By prorating compensation to probability statistics, 10 people — each with a one in 10 chance of deserving compensation — could be compensated for the same total outlay that would be due the one truly deserving individual among them (if it could be figured out who that was). Moreover, with this method, it's likely more of the truly deserving will not be overlooked — even if they only win partial compensation.

Acknowledging this system would tend to reward many times the number of persons who would, based on statistical accounting, actually have deserved compensation, Hatch notes that "at least as far

A move is underway to marry statistics and epidemiology for more equitable environmental claims adjusting

as the deadly cancers are concerned, several times the people harmed is not likely to number more than a few hundred."

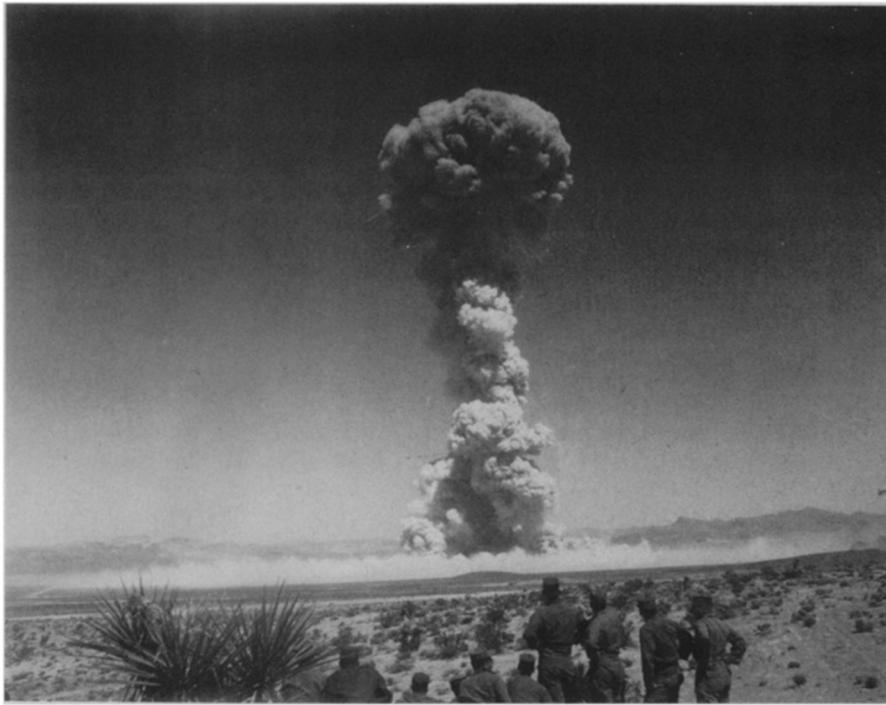
In addition to the fallout victims, the Hatch bill would provide for two other groups of radiation victims. Uranium miners who between 1947 and 1961 worked in Colorado, New Mexico, Arizona or Utah would also qualify, with compensation figured the same way as for the fallout claimants. (Hatch pointed out in a March 23 speech on the Senate floor that most miners with radiation-induced cancers are American Indians who for legal or technical reasons today have no legal right to compensation from either the mining companies or their state's workers-compensation program.) Finally, the bill would provide grounds for compensating military veterans who had suffered harm as a result of exposures received while participating in early nuclear-weapons tests, such as the Smoky exercises (SN: 2/17/78, p. 92).

Such veterans already qualify for compensation through the Veterans Administration, and indeed, Hatch's bill would not remove the VA's responsibility to them. "However," Hatch says, "the veterans feel justifiably frustrated at the obscure and convoluted methods that the VA employs to determine whether a veterans' cancer has been caused by his service-connected exposure to ionizing radiation. Therefore, the VA will be required to use the radioepidemiological tables being developed by HHS as a standard for judging the merits of atomic veterans' cases." Not only would this make resolution of compensation claims simpler, but also fairer, Hatch believes.

For those would-be claimants who died before the act goes into effect, claims (by their heirs) would be allowed only if the individual had died of cancer. Otherwise, the statute of limitations for civilians would be two years from the time compensation became available, or two years from the diagnosis of a plaintiff's cancer.

Finally, insurance companies would not get off the hook. Any federal remedy under this act would be in addition to, not in lieu of, responsibilities to which commercial insurers were obligated.

Speaking at the plenary session of the Health Physics Society meeting in Baltimore last June, Ronald Preston conceded



Defense Nuclear Agency

*Delayed casualties of fallout from Nevada tests, like this 1955 one, are hard to prove.*

that "the [radioepidemiological] tables committee at NIH must rely on many calculated assumptions. Everyone here knows this, and everyone here knows that many of these assumptions can be challenged." However, said Preston, who is science adviser to the Senate Labor and Human Resources Committee, which Hatch chairs, "certitude is not necessary for justice or public confidence. Candor is." If the tables are not perfect (and frankly, nobody expects they will be), so be it, Preston said. "The best we can do now will entail some scientific compromises."

In fact, he cautioned, the scientific community had better be prepared to engage in some compromising on this issue. "The courts are not going to sit on this issue indefinitely," he said. "Ultimately, they will bend the law to meet the socially perceived need for justice. And when they do," he prophesied, "the court remedy is unlikely to be so carefully tied to science."

Victor Bond agrees. But then he's been a proponent of the probability-of-causation philosophy for many years. Not surprisingly, he is also the individual who first introduced the concept to Hatch and the congressional staff members who drafted Hatch's cancer-compensation legislation.

Assistant director for life sciences at Brookhaven National Laboratory, in Upton N.Y., Bond also chaired working-group 71 of the independent National Council for Radiation Protection (NCRP). Bond's group recently completed a report detailing the probability-of-causation philosophy, methodology, and what Bond describes as "reasonably extensive, but not complete tables" on the probability that a given radiation exposure will cause a particular cancer to develop. This report, which could be issued publicly by the end

of the year, is currently circulating for comment within the NCRP membership.

The working group's report was prompted by a request from the Labor Department for advice on how to handle the radiation-compensation claims that it was receiving. Bond is careful to point out that NCRP makes no recommendations, it just outlines the applicable science and what are currently thought to be prudent options. However, he points out that among scientists who have studied the problem of determining the merit of individual radiation-injury claims, "It's generally agreed that [probability-of-causation] is the fairest and most equitable way to handle this difficult situation."

In theory, that is. Bond acknowledges that some people are concerned about whether the concept might not be ripe for abuse. Specifically, he said, there is debate over how low a probability to compensate. For instance, many who today challenge the scheme object to compensating probabilities below 50 percent. However, most of these objectors would accept the concept of payoffs below 50 percent, Bond believes, if such awards were prorated — as the Hatch bill stipulates — and if there was a cap on total compensation allowed.

Moreover, Bond points out, there is already a precedent for using probability of causation in settling radiation compensation claims. By way of example, he cites its use in a Swedish case during the 1960s, in testimony he gave several years ago involving guards exposed to radiation at the Nevada Test Site, in a recent worker's compensation claim in California, in cases last year involving two Chalk River (Canada) nuclear-plant employees and as the core of an agreement between the British Nuclear Fuels Corp. and its unionized em-

ployees. But all analysts concede that the concept's long-term utility will rest with the credibility of the radioepidemiological tables being developed now at NIH.

Even among scientists, opinions about radiation causation abound. "Therefore, we thought it important that our [NIH tables] committee not only do the best possible job scientifically, but that it also have a certain credibility," explains Joseph (Ed) Rall, NIH Deputy Director for Intramural Research. "And the people on the [radioepidemiological tables] group that I chair," Rall points out, "are not identified with any of the extreme positions."

"But we wanted more than that," he adds, "so naturally we turned to the [National Academy of Sciences], asking them to set up a committee which would look over our methodology and results, comment on them, and criticize."

This NAS oversight group, which first met Sept. 30, will be invited to all of the NIH group's future meetings, will receive copies of all the NIH group's working documents and will be asked to provide feedback on the NIH group's approach to building the tables. "We decided to do this," Rall told SCIENCE NEWS, "because there's no point in trying to calculate tables if there's a disagreement between the committees on the fundamental assumptions that go into making them."

The NIH tables will list cancer-development probabilities for radiation exposure of 1, 5, 10, and 50 rads, and formulas to extrapolate for intermediate exposures. Separate tables for men and women will be computed for each cancer type.

Although the tables are technically due out by Jan. 4, Rall concedes, "That's just impossible. Rushed as we can be, we can't be rushed beyond the point of doing a good job — this is just too important an enterprise. So I've already written [HHS Assistant Secretary] Edward Brandt and discussed it with [the Hatch committee] staff to say that we will probably be lucky if we make it by May." Remember, Rall says, "this is a fledgling attempt to try and adjudicate a kind of scientific equity, and could well serve as a precedent for a variety of other circumstances where citizens are inadvertently exposed to noxious environmental agents."

Rall also admits that constructing probability-of-causation tables for any environmental agent other than radiation is a long way off. As sketchy as the data base is, in places, for developing the cancer-risk coefficients that NIH will use in its tables, taken as a whole, those data are still far stronger than what's available "for any other carcinogenic agent that I know of," Rall says.

What kind of reception does he expect his group's tables will receive? "Past history suggests there'll be a lot of nitpicking," Rall says, "because there are a lot of people who have very strongly held views and it's quite conceivable there'll be a lot of money at stake." □