

Testimony of Lilly Adams¹
Independent Consultant Specializing in Nuclear Weapons Issues

Hearing On
“Examining the Need to Expand Eligibility Under the Radiation Exposure Compensation Act”

Committee on the Judiciary
Subcommittee on the Constitution, Civil Rights, and Civil Liberties

March 24, 2021

¹ My comments today are my own and do not necessarily reflect the views of the organizations I am affiliated with.

I would like to thank Chairman Nadler, Chairman Cohen, Ranking Member Johnson, and all committee members for the opportunity to submit testimony on this issue. I also would like to thank the many individuals who have supported this testimony, including many members of impacted communities, my colleagues at the Union of Concerned Scientists, and researchers and scientists that have contributed invaluable information to this field, including Robert Alvarez, Dr. Arjun Makihijani, and Dr. David Richardson.

The Radiation Exposure Compensation Act (RECA) is a valuable, if limited, program that begins to address the suffering and harm caused to US residents by US nuclear weapons testing and uranium mining and milling. I'm grateful that the committee is taking the time to assess RECA. In this testimony I will provide some basic information about the program, the history that led to its creation, and identify some of the program's limitations.

SECTION 1: Background on RECA, US Nuclear Testing, and Uranium Mining

Between 1945 and 1963 the United States government conducted over 200 atmospheric nuclear weapons tests. One hundred of these were performed at the Nevada Test Site about 65 miles northwest of Las Vegas. Radiation effects from these tests were not limited to the test site, since an atmospheric nuclear weapons explosion creates a cloud of radioactive debris and particles, which is then dispersed by wind.

Starting in the 1940s, the United States government also initiated a large scale program for the acquisition and enrichment of uranium for its nuclear weapons program. The US mined uranium across the Western and Southwestern United States. This material was processed and refined at uranium milling plants for use in nuclear weapons, nuclear propulsion, and nuclear energy.

Both nuclear weapons testing and uranium production activities have left behind a tragic and toxic legacy. RECA attempts to address some of that legacy by providing compensation to individuals with specific diseases that are presumed to have been caused by radiation exposure due to these US government activities. Fallout from nuclear testing poses health risks to people from both internal exposure (inhalation, skin absorption, or ingestion through contaminated food and water), and external exposure (gamma rays emitted by radioactive particles on the ground). Radiation exposure from uranium mining, milling, and other jobs in the uranium industry occurs through inhalation of radon gas and its derivatives, ingestion of radioactive dusts, and external ionizing radiation exposures in the uranium mines and uranium processing facilities.² Individuals from three groups who have developed these illnesses can apply for this one-time compensation:

² Committee on Uranium Mining in Virginia; Committee on Earth Resources; National Research Council, "Uranium Mining in Virginia: Scientific, Technical, Environmental, Human Health and Safety, and Regulatory Aspects of Uranium Mining and Processing in Virginia." Washington (DC): National Academies Press, (2011 Dec 19, 2011). Chapter 5: Potential Human Health Effects of Uranium Mining, Processing, and Reclamation, <https://www.ncbi.nlm.nih.gov/books/NBK201047/>.

1. “Onsite participants” of atmospheric nuclear weapons tests, conducted between 1945 and 1963, are eligible for \$75,000. These can be either military servicemembers or civilian contractors employed at US nuclear weapons test sites.
2. Downwinders, or individuals who lived downwind of the Nevada Test Site from 1951 to 1958, or during July of 1962, are eligible for \$50,000.
3. Uranium miners, millers, and ore transporters who worked in the uranium industry from 1942 to 1971 are eligible for \$100,000.

RECA also provides funding for local health centers and nonprofit organizations to conduct cancer screenings and support individuals in filing RECA claims.

RECA was established in 1990 and minimally expanded in 1992 and again in 2000. While Congress has considered a number of adjustments and has commissioned studies since then, no substantive changes have been made in 20 years. As of March 2021, RECA has paid out roughly \$2.44 billion to nearly 38,000 individuals.³ This amount pales in comparison to broader nuclear weapons spending, which is estimated to be at least \$1.2 trillion over the same period of time, between 1990 and 2021.⁴ This means that so far RECA has roughly cost less than one quarter of one percent, or 0.2%, of the cost of our nuclear weapons arsenal in the same period of time.

SECTION 2: Remediating Harm

This program is crucial because the US government put people in harm’s way without informing them of the risks, and therefore has a responsibility to help them. While the potential for negative health impacts was known, the US government chose not to take adequate precautions to protect or inform US residents or monitor their health. Instead, the government repeatedly chose to ignore, suppress, and dismiss the available information to avoid casting a negative light on nuclear weapons development. Dr. Arjun Makhijani of the Institute for Energy and Environmental Research states: “It is a remarkable fact of nuclear weapons history and radiation risk that every nuclear-weapon state has first of all harmed its own people in the name of national security.”⁵

Before testing began at the Nevada Test Site, the US Atomic Energy Commission (AEC) knew from previous tests and modeling that testing in Nevada could put nearby communities at risk

³ “AWARDS TO DATE 03/18/2021” Radiation Exposure Compensation Act, The United States Department of Justice, Updated March 18, 2021, <https://www.justice.gov/civil/awards-date-03182021>.

⁴ Stephen I. Schwartz, *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons Since 1940*, (Brookings Institution Press, June 1, 1998). Updated through personal communication with the author to extend cost estimates through 1990.

<https://www.brookings.edu/the-hidden-costs-of-our-nuclear-arsenal-overview-of-project-findings/>.

⁵ Arjun Makhijani, “A Readiness to Harm: The Health Effects of Nuclear Weapons Complexes,” *Arms Control Today*, Corrected online August 29, 2008,

<https://www.armscontrol.org/act/2005-07/features/readiness-harm-health-effects-nuclear-weapons-complexes>.

and spread radiation further across the country, depending on weather patterns.⁶ Early days of testing confirmed this: high levels of radiation were discovered as far away as Indiana⁷ and New York⁸, and the government became aware of reports that milk supplies from cows and goats were contaminated with Iodine-131,⁹ which could pose particular risk to children.¹⁰ The AEC did not systematically monitor milk supplies for fear that it would raise public concern, nor did it systematically monitor exposure in other forms.¹¹

The AEC did not adequately warn nearby residents of the risks of testing. Instead, they distributed pamphlets assuring people that they were “in a very real sense active participants in the Nation’s atomic test program.” And while they may have been “inconvenienced by our test operations” and “at times... exposed to potential risk from flash, blast, or fall-out,” they were assured that no tests would be performed “unless there is adequate assurance of public safety” and that there was no risk outside of the testing area.¹²

The US government needed an enormous supply of uranium fuel for its nuclear weapons program. Before mining began in the United States, the government was aware of the link between lung cancer and uranium mining.¹³ Throughout the 1950s, the US Public Health Service (PHS) studied conditions in uranium mines and the health of uranium miners. Concerned over high radiation levels, the PHS recommended adopting exposure limits and standards, and safety protocols such as proper ventilation.¹⁴ Again, the AEC chose not to enforce these safety standards. Individual workers were also not informed that their illnesses could be work-related.¹⁵

Due to this lack of informed consent, US uranium workers were included in a 1994 study requested by President Bill Clinton, the results of which were reported to a Cabinet-level group charged with investigating reports of possibly unethical human radiation experiments funded by

⁶ Raye Ringholz, *Uranium Frenzy: Saga of the Nuclear West*, (Logan, Utah: Utah State University Press, 2002).

⁷ J. Newell Stannard, *Radioactivity and Health: A History*, DOE/RL/01830-T59 (DE88013791) Distribution Category UC-408 (Battelle Memorial Institute, Office of Scientific and Technical Information, October, 1988) Vol. 2, pp. 885-86.

⁸ Robert J. List, *The transport of atomic debris from Operation Upshot-Knothole*, NYO-4602, (Washington: US AEC), June 25, 1954, p. 80.

⁹ Pat Ortmeyer and Arjun Makhijani, “Let them Drink Milk,” Institute for Energy and Environmental Research, *October 1997, Updated April 15, 2009*, <https://www.ieer.org/latest/iodnart.html>.

¹⁰ National Cancer Institute, “Get the Facts about Exposure to I-131 Radiation.” <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/i-131>.

¹¹ *Allen v United States*, 588 F. Supp 247, 377-382 (D. Utah 1984), <https://law.justia.com/cases/federal/district-courts/FSupp/588/247/1679598/>.

¹² United States Atomic Energy Commission, *Atomic Test Effects In The Nevada Test Site Region*, (January 1955), http://www.fourmilab.ch/etexts/www/atomic_tests_nevada/.

¹³ Gary E. Madsen and Susan E. Dawson, “Unfinished business: Radiation Exposure Compensation Act (RECA) for post-1971 U.S. uranium underground miners,” *Journal Of Health And Social Policy*, 19 no. 2, (2005), <https://pubmed.ncbi.nlm.nih.gov/15855079>.

¹⁴ Advisory Committee on Human Radiation Experiments - Final Report to the Human Radiation Interagency Working Group, Chapter 12: The Uranium Miners, October 1995, <https://bioethicsarchive.georgetown.edu/achre/final/summary.html>.

¹⁵ *ibid*

the government.¹⁶ The report concluded that, “As a consequence of exposure to radon and its daughter products in underground uranium mines, at least several hundred miners died of lung cancer and surviving miners remain at elevated risk. These men, who were the subject of government study as they mined uranium for use in weapons manufacturing, were subject to radon exposures well in excess of levels known to be hazardous. The government failed to act to require the reduction of the hazard by ventilating the mines, and it failed to adequately warn the miners of the hazard to which they were being exposed.”¹⁷

As the primary purchaser of uranium and the main reason for the industry’s existence, the federal government had a clear responsibility for the well-being of uranium workers.

Congress held hearings on these issues as early as 1959, with multiple hearings in the late 1970’s and early 1980’s.^{18,19} In 1982, 1,192 downwinders of the Nevada Test Site sued the US government for negligent release of radiation, failure to adequately monitor fallout released offsite, and failure to inform downwinder plaintiffs of danger. In his ruling in 1984, Judge Bruce S. Jenkins concluded that the government was negligent in monitoring off site exposure and informing nearby residents of the risks. Jenkins found that the AEC’s public statements about the risks of fallout, “demonstrate that responsible persons at the operational level of continental nuclear testing neglected an important, basic idea: *there is nothing wrong with telling American people the truth.*”²⁰

However, the ruling was overturned in 1987, with the reasoning that the “federal government could not be held liable under the Federal Tort Claims Act.” Chief Judge Monroe McKay stated in the opinion as part of the ruling: “While we have great sympathy for the individual cancer victims who have borne alone the costs of the A.E.C.’s choices, their plight is a matter for Congress.”²¹

Legislation had been introduced since 1979 to enact a program like RECA, but the reversal of Judge Jenkins’ decision seemed to spur Congress to finally take action, and RECA was passed in 1990.²² It is worth noting that in his ruling, Judge Jenkins awarded plaintiffs between \$100,000 to \$625,000.²³

¹⁶ *ibid*

¹⁷ *ibid*

¹⁸ *Health Impact of Low-Level Radiation: Joint Hearing before the Subcommittee on Health and Scientific Research of the Senate Committee on Labor and Human Resources and the Senate Committee on the Judiciary*, 96th Cong., 1st Sess. (1979).

¹⁹ Molly Ivins, “50’s Uranium Miners Tell of Disease and Fight for Aid,” *New York Times*, Sept. 1, 1979, <https://www.nytimes.com/1979/09/01/archives/50s-uranium-miners-tell-of-disease-and-fight-for-aid-responsibility.html>.

²⁰ *Allen v United States*, 405. <https://law.justia.com/cases/federal/district-courts/FSupp/588/247/1679598/>.

²¹ AP, “Negligence Ruling On U.S. Atom Tests Overturned,” *New York Times*, April 22, 1987, <https://www.nytimes.com/1987/04/22/us/negligence-ruling-on-us-atom-tests-overturned.html>.

²² Trisha Pritikin, *The Hanford Plaintiffs: Voices From the Fight For Atomic Justice*, (University Press of Kansas, 2020), 264-5.

²³ AP, “Negligence Ruling On U.S. Atom Tests Overturned,” *New York Times*, April 22, 1987, <https://www.nytimes.com/1987/04/22/us/negligence-ruling-on-us-atom-tests-overturned.html>.

SECTION 3: Shortcomings Of the Existing Program

As noted earlier, RECA has always been a limited program. Some of the proposals for expanding the program include:

- Extending the program past the current July 2022 sunset date
- Increasing the amount awarded to claimants
- Expanding eligibility of downwind areas to include broader geographic areas, and to include specific populations such as those downwind of the Trinity Test site, those in Guam, and US veterans engaged in nuclear clean-up efforts
- Expanding coverage of uranium workers to those employed after 1971
- Revising the list of compensable diseases in light of contemporary scientific evidence

I highly recommend that in assessing these proposals, the committee make every effort to hear directly from those most impacted by these issues. While I am grateful to be able to provide an overview of these issues, it is of the utmost importance to also hear the experiences of these community members first-hand, especially those who were not able to be heard at the hearing today.

July 2022 sunset and access to RECA

Perhaps the most urgent limitation of RECA is that it is set to sunset in July 2022. This would likely exclude people who would otherwise be eligible from getting compensation. Because some of the compensable illnesses can take decades to manifest, this could include those who have been more recently diagnosed with a compensable illness but have not yet been able to go through the compensation process. Additionally, some exposed individuals may not have yet been diagnosed with a compensable illness, but may in the near future, and if RECA is allowed to expire they would never be able to apply.

In some cases, exposed communities or individuals may still be unaware that compensation is available. Communities have reported issues around communication, education, and awareness of RECA: who is eligible, and how to apply. Claimants also report that the process of applying can be incredibly challenging, often taking years to compile the necessary documentation and complete the process of applying. This is an even higher barrier for Indigenous claimants who often may not have the documentation necessary to file claims, such as birth certificates, hospital records, and more, because of cultural and institutional differences. Because of this, there have also been recommendations to expand the use of affidavits to establish certain eligibility criteria.²⁴

²⁴ Other Issues Of Public Concern Regarding Eligibility For Compensation: Chapter 7. National Research Council. 2005. *Assessment Of The Scientific Information For The Radiation Exposure Screening And Education Program*. Washington, DC: The National Academies Press, <https://www.nap.edu/read/11279/chapter/9?term=affidavit#203>.

Atomic Veterans, those who worked on the nuclear test program, were sworn to secrecy until 1996, when veterans were released from their oath of secrecy.²⁵ Every year, the National Association of Atomic Veterans finds new members who have not realized that they are now able to speak about their experience onsite for tests, and are also unaware that they are eligible for RECA compensation.

RECA also offers survivors benefits, so even for those that have passed away while waiting for compensation, an extended program could still provide much-needed support for surviving family members. This is an important benefit to maintain.

Increasing payment amounts

The compensation provided by RECA is already very limited. Another way to improve the program would be to raise the amount of money paid to claimants. The amount has been unchanged since 1990, despite inflation. Even at that time, \$50,000 to \$100,000 often barely covers the cost of cancer care, and in many cases does not even meet that low bar. In a broader sense, RECA is also a very limited program compared to other compensation programs like the EEOICPA, which offers medical benefits in addition to one-time compensation.

For many of the individuals seeking compensation, this money is sorely needed. People in these communities have shared stories of RECA compensation being the difference between losing or keeping their homes, bankruptcy and financial stability, and because of the possibility of using compensation for medical bills, the difference between living and dying. In some cases, medical care is already extremely hard to access, especially for claimants in rural areas. People have held bake sales to raise the gas money needed to drive to the hospital for cancer care. RECA can help offset these costs.

Post '71 Uranium Workers

RECA currently limits eligibility to uranium workers employed before 1972. There are two main reasons that have been put forward for this.

The first is that after 1971, the private uranium industry grew and the US government stopped being the main purchaser of domestic uranium. However, the federal government nonetheless continued to purchase and enrich uranium after 1971. Uranium workers employed after 1971 were also told by their employers that they “were doing their part for the Cold War effort...The uranium industry used every available tool to get the workers to produce yellowcake as fast as they could...”²⁶ Linda Evers, a post-71 Uranium Workers from Grants, NM shares: “We were told every day that we were working to secure the freedom of every American in this country, and it

²⁵ Veterans Administration, “Are YOU An Atomic Veteran?” (Brochure, Washington DC, 2012), <https://www.publichealth.va.gov/docs/radiation/atomic-veteran-brochure.pdf>.

²⁶ Post '71 Uranium Workers Committee, Written Testimony, 2018, <https://nuclear-voices.org/2020/01/18/post71/#resources-post71>.

seems that it is a harsh reality that the country we gave our lives for continues to ignore us now when we need our government to help us.”²⁷

The second reason put forward for the cut-off date is that in 1971, the government passed a stricter exposure standard from uranium mines, which was intended to protect workers. In reality, this standard was not enforced, changes in ventilation and other measures to reduce exposure were only slowly implemented, and miners continued to be exposed to unsafe levels of radon and other hazards. Mining companies also often manipulated data to artificially lower radiation records, or simply did not monitor radiation levels.²⁸

Additional research since RECA's creation has also shown that the new exposure standard was still too high: “Since 1971, with the creation of the [new] federal standard, strong scientific evidence has indicated that this standard was not stringent enough to protect the health of the miners.”²⁹ In 1987, for example, the National Institute for Occupational Safety and Health (NIOSH) recommended that annual radon decay products exposures to workers in underground mines should not exceed 1 Working Level Months (a four-fold reduction from the 1971 federal standard).³⁰

The US government essentially established this industry for the sole purpose of creating nuclear weapons. The ongoing culture of minimal or nonexistent protection for workers that continued through the 1970s and 80s was in part a product of decades of government neglect and a dismissal of scientific evidence of risk. The question of who purchased the uranium they were mining and processing is immaterial to the workers. They experienced the same unsafe work practices, and now experience the same illnesses.

Susan Dawson and Gary Madsen, formerly at the University of Utah, conclude: “The RECA legislation date of eligibility was based entirely on the federal government’s uranium procurement program, rather than on scientific evidence of the relationship between exposures and health outcomes....We argue that the federal government should include [Post ‘71 workers] in RECA since it did not develop more stringent standards as suggested by its own health and safety agencies.”³¹

It has also been proposed that uranium core drillers and remediation workers be added to the list of occupations eligible for compensation.

²⁷ Linda Evers, Personal Written Testimony, 2018, <https://nuclear-voices.org/2020/01/18/post71/#resources-post71>.

²⁸ Madsen and Dawson, “Unfinished business.”

²⁹ *ibid*

³⁰ National Institute for Occupational Safety and Health, “A recommended standard for occupational exposure to radon progeny in underground mines.”; (US Department of Health and Human Services, 1987), 99.

³¹ Gary E. Madsen and Susan E. Dawson, “Unfinished business: Radiation Exposure Compensation Act (RECA) for post-1971 U.S. uranium underground miners,” *Journal Of Health And Social Policy*, 19 no. 2, (2005), <https://pubmed.ncbi.nlm.nih.gov/15855079>.

Additional downwind areas

At the beginning of RECA, the demarcation of downwind eligibility areas was proposed as the area marked by drawing a square around the Nevada Test Site, a designation that disregards what we know about how fallout is dispersed.³² The current designation does a slightly better job by generally including counties near the test site. But it still excludes some of the counties closest to the test site, such as in Nevada, Arizona, and Utah, and cuts off compensation at certain county lines, despite the fact that fallout does not simply stop at county lines.

Recent peer-reviewed scientific literature have produced a wide range of estimates of fatal cancers associated with the US atmospheric nuclear weapons testing program. This uncertainty underscores the challenges of accurately reconstructing radiation doses decades after testing began, especially when the existing data are so lacking. This follows, in part, from inadequate monitoring of radiation exposures at the time. For example, a National Academies of Science report on this topic acknowledges that “Among the 3000 plus counties in the continental United States, fallout monitoring in areas other than a limited region in Nevada and its neighboring states occurred at never more than 95 stations through the years of aboveground US nuclear-weapons testing.”³³

Without sufficient data, scientists have to leverage assumptions in order to estimate radiation exposures and associated cancers, and the assumptions they choose result in the vastly different results that we see reported in these studies. But what they all demonstrate is that the scope of harm from testing is extensive. It is very possible that government studies to date have underestimated exposure.

Given this, it is clear that RECA as it stands does not cover the full population of people who were exposed. I recommend further exploration of the following key groups as possibilities for expansion and inclusion in downwind eligibility areas:

- 1) Broader geographic areas

A 1997 study by the National Institutes of Health’s National Cancer Institute (NCI) examining Iodine-131 in fallout provided evidence that many of the most exposed US counties are outside of the current RECA eligibility area, including in states like Utah, Idaho, Montana, and North and South Dakota.³⁴ These regions should be further examined.

³² Congressional Research Service, “The Radiation Exposure Compensation Act (RECA): Compensation Related to Exposure to Radiation from Atomic Weapons Testing and Uranium Mining,” (Updated January 13, 2021), 10. <https://crsreports.congress.gov/product/pdf/R/R43956>.

³³ “Exposure from Global Fallout: Chapter 6,” National Research Council. 2005. *Assessment Of The Scientific Information For The Radiation Exposure Screening And Education Program*. Washington, DC: The National Academies Press, <https://www.nap.edu/read/11279/chapter/8>.

³⁴ National Cancer Institute, “*Estimated Exposures and Thyroid Doses Received by the American People from Iodine-131 in Fallout Following Nevada Atmospheric Nuclear Bomb Tests*,” (October 1997), <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/i-131>.

1) People living downwind of the Trinity Test site.

In 1945, the United States tested its first ever nuclear weapon, conducting the Trinity Test in New Mexico. The US government claimed that the Trinity site was remote and uninhabited, but census data shows that there were tens of thousands of people living within a 50-mile radius of the site. The test produced fallout that fell for days and contaminated drinking water, crops, and livestock.³⁵ It is now known that exposure rates in public areas around the test were many times higher than currently allowed.³⁶ A recent NCI report links the Trinity test alone to up 1000 cancer cases,³⁷ and independent experts and local advocates have raised concerns that even this number greatly underestimates exposure and does not take into account important data. Infant mortality rates also spiked sharply in the months following the Trinity test, after a steady decline over the previous several years.³⁸

2) People in Guam downwind from Pacific test sites.

In 2004, residents, advocates, and Congressional leaders in Guam raised the concern of radiation exposure in Guam due to testing at the Pacific Proving Grounds. In 2005 the National Academies of Science concluded: “As a result of its analysis, the committee concludes that Guam did receive measurable fallout from atmospheric testing of nuclear weapons in the Pacific. Residents of Guam during that period [1946-1962] should be eligible for compensation under RECA in a way similar to that of persons considered to be downwinders.”³⁹

3) US Veterans involved in clean-up activities

RECA eligibility for veterans has so far not been extended to those who were charged with cleaning up nuclear waste from tests and/or accidents. One such group is the roughly 1600 US veterans tasked with cleaning up plutonium after a nuclear accident in Palomares, Spain.⁴⁰

³⁵ Tularosa Basin Downwinders Consortium, “*Unknowing, Unwilling, and Uncompensated: The Effects of the Trinity Test on New Mexicans and the Potential Benefits of Radiation Exposure Compensation Act (RECA) Amendments.*” Feb. 2017, https://2da8c03d-74f5-4bef-aa16-a6b9c4cb1631.filesusr.com/ugd/2b2028_8e221b260de7468bbcb67cbd498d8be.pdf.

³⁶ Thomas Widner, [Final Report of the Los Alamos Document Retrieval and Assessment \(LAHDRA\) Project](https://www.cdc.gov/LAHDRA/Content/pubs/Final%20LAHDRA%20Report%202010.pdf), Centers for Disease Control and Prevention, November 2010, <https://www.cdc.gov/LAHDRA/Content/pubs/Final%20LAHDRA%20Report%202010.pdf>

³⁷ National Cancer Institute, “*Study to Estimate Radiation Doses and Cancer Risks Resulting from Exposure to Radioactive Fallout from the Trinity Nuclear Test,*” (Updated: December 29, 2020), <https://dceg.cancer.gov/research/how-we-study/exposure-assessment/trinity>.

³⁸ Kathleen M. Tucker and Robert Alvarez, “Trinity: “The most significant hazard of the entire Manhattan Project,” *The Bulletin of the Atomic Scientists*, July 15, 2019, <https://thebulletin.org/2019/07/trinity-the-most-significant-hazard-of-the-entire-manhattan-project/>.

³⁹ “Additional Populations Environmentally At Risk For Radiation Exposure: Chapter 7,” National Research Council. 2005. *Assessment Of The Scientific Information For The Radiation Exposure Screening And Education Program*. Washington, DC: The National Academies Press, <https://www.nap.edu/read/11279/chapter/9?term=guam#199>.

⁴⁰ Jan Beyea and Frank N. von Hippel, “History of Dose, Risk, and Compensation Assessments for US Veterans of the 1966 Plutonium Cleanup in Palomares, Spain,” *Health Physics*, 117, no.6 (Dec 2019): 625–636.

Independent studies have shown previous estimates of exposure were greatly underestimated and that veterans were exposed to dangerous levels of plutonium, especially through inhalation, which would have likely led to adverse health outcomes and therefore warrant compensation. Another population is the over 8000 servicemembers and civilians tasked with cleaning up Enewetak Atoll in the Marshall Islands and building Runit Dome, a waste depository for material and soil that was highly contaminated with plutonium and other deadly radioactive material. The men involved report that almost no protective safety gear was worn during the mission, that often when high exposure readings were registered, they were not reported, that film-badges consistently failed because of the humidity, and that other safety precautions, though promised, were not taken. Many of the men involved in the mission now report cancers and other illnesses they attribute to radiation, and many have passed away.⁴¹

Presumptive Diseases versus Probability of Causation

Because of this uncertainty and the challenge of proving causation of cancer, RECA uses a presumptive model, only requiring claimants to demonstrate residence in a certain area and presence of a compensable disease. It has been suggested that RECA could instead use a “probability of causation/assigned share (PC/AS)” model, in a similar way to programs like the Energy Employees Occupational Illness Compensation Program Act (EEOICPA).⁴² It is my belief that such a model is inappropriate and unjust in this context. When such calculations are used in decision-making in EEOICPA, we have much more specific data on worker exposures, often based on personal radiation monitoring badges and bioassay data, which makes such a model feasible. This is not true for civilian downwind exposures. Even under the EEOICPA, when such data are lacking, a list of presumptive cancers is used, similar to RECA. A PC/AS model is not appropriate when little data are available on individual exposures. In addition, causation models have been found to be very expensive to administer, due to the high costs of carrying out dose reconstruction for individuals.⁴³

RECA has always operated within the limitations of the data that we have, and this was acknowledged by President George H.W. Bush when he signed RECA into law: “The bill provides compassionate payments to persons with specified diseases who fear that their health was harmed because of fallout from atmospheric atomic testing at the Nevada test site, regardless of whether causation can be scientifically established.”⁴⁴ The presumption model used is an important element of RECA that recognizes the failings of the government to collect the data needed for a causation model. While requirements for eligibility may need to be updated and adjusted, and even expanded, a causation model should not be adopted.

⁴¹ Dave Phillips, “Troops Who Cleaned Up Radioactive Islands Can’t Get Medical Care,” *New York Times*, Jan. 28, 2017, <https://www.nytimes.com/2017/01/28/us/troops-radioactive-islands-medical-care.html>.

⁴² “Probability Of Causation: Chapter 5,” National Research Council. 2005. *Assessment Of The Scientific Information For The Radiation Exposure Screening And Education Program*. Washington, DC: The National Academies Press.

⁴³ Government Accountability Office, “Additional Independent Oversight and Transparency Would Improve Program’s Credibility” (March 2010), 22-24, <https://www.gao.gov/assets/gao-10-302.pdf>.

⁴⁴ George H.W. Bush, “Statement on Signing the Radiation Exposure Compensation Act,” The American Presidency Project, (October 15, 1990), <https://www.presidency.ucsb.edu/node/265083>.

Finally, as RECA is updated, the list of presumptive diseases it covers should be reviewed and updated to reflect scientific evidence that has accumulated since the original legislation was passed.

RECA is a program based on a model of compassionate compensation. The government knew that atmospheric nuclear weapons testing and uranium production carried serious health risks, but chose not to adequately protect or inform those in harm's way. This has caused decades of suffering and death for many in these communities. RECA has been an important step in righting this wrong, but it is extremely limited and has moved too slowly, as untold thousands have died waiting for compensation and recognition. Congress should extend and expand the program to ensure it achieves its purpose.