

Miller, Diane M. (CDC/NIOSH/EID)

From: jeff prager [j.prager@yahoo.com]
Sent: Tuesday, March 15, 2011 9:24 AM
To: NIOSH Docket Office (CDC)
Subject: RE: docket number NIOSH- 227
Attachments: Report Docket No. NIOSH 227 JP2.pdf

Dear Ms. Miller,

Please find attached a second and final report titled, "Report Docket No. NIOSH 227 JP2" in PDF format per specifications at your request. I apologize that the data in this report was not included in the first report but the information contained in this report is wholly separate and necessitated separation into a second report as a result.

It is my sincere hope that these two reports have an impact on the final decision and that **all** cancers are covered.

This report is also available at the following link:

<http://www.datafilehost.com/download-9df50c1e.html>

Cordially,

Jeff Prager
Minneapolis MN
612-353-6045

--- On **Mon, 3/14/11, NIOSH Docket Office (CDC)** <niocindocket@cdc.gov> wrote:

From: NIOSH Docket Office (CDC) <niocindocket@cdc.gov>
Subject: RE: docket number NIOSH- 227
To: "jeff prager" <j.prager@yahoo.com>
Date: Monday, March 14, 2011, 3:10 PM

Thank you very much.

Diane M. Miller
NIOSH Docket Officer
513/533-8450
dmm2@cdc.gov

From: jeff prager [<mailto:j.prager@yahoo.com>]
Sent: Monday, March 14, 2011 2:33 PM
To: NIOSH Docket Office (CDC)
Subject: RE: docket number NIOSH- 227

As per your request the attached report has been reformatted to 8.5 x 11 inch standard sized paper with 0.5 inch page borders. It is also available for download at the link below:

<http://www.datafilehost.com/download-dda104bd.html>

Additional data not in this report:

The general population incidence of Myeloma, a rare blood plasma cancer, is 3.8 to 9.0 per 100,000 with 99% above the age of 65 and an average age of 71.

The population of 40,000 First Responders have experienced an incidence rate as of March 7 of 1 in 298.507 or rounded, 1 in 299. This figure is arrived at using the current deaths of patients from Myeloma which was 134 on March 7, 2011.

The First Responders that have died from Myeloma were all between 37 and 60.

Obviously the incidence of Myeloma in First Responders is alarming, to say the least. Rather, it's simply unprecedented in human history. Not Hiroshima, nor Nagasaki, nor Chernobyl produced these dramatic figures and these figures are the product of only the first ten years beyond the events of 911.

The factor missing from the US government response was empathy. I am not the only person that knows 911 was a nuclear event although I am one of a very few.

Cordially,

Jeff Prager
Minneapolis MN
612-353-6045

--- On **Mon, 3/14/11, NIOSH Docket Office (CDC)** <niocindocket@cdc.gov> wrote:

From: NIOSH Docket Office (CDC) <niocindocket@cdc.gov>
Subject: RE: docket number NIOSH- 227
To: "jeff prager" <j.prager@yahoo.com>
Date: Monday, March 14, 2011, 10:59 AM

Mr. Prager—we are not able to print the attachment. It is too large for all of our paper. Could you please send a smaller version of it? Thank you.

Diane M. Miller
NIOSH Docket Officer
513/533-8450
dmm2@cdc.gov

From: jeff prager [<mailto:j.prager@yahoo.com>]
Sent: Friday, March 11, 2011 11:54 PM
To: NIOSH Docket Office (CDC)
Subject: docket number NIOSH- 227

You may submit comments, identified by docket number NIOSH- 227, by any of the following methods: Mail:

NIOSH Docket Office, Robert A. Taft Laboratories, MS-C34, 4676 Columbia Parkway, Cincinnati, OH 45226.
Facsimile: (513) 533-8285. E-mail: nioshdocket@cdc.gov.

Document attached.

The attached document is part of a 3-part document posted to the internet on March 1st, 2011. The attached document is pages 21-42 of the larger 3-part document. For links to the larger document feel free to contact me.

Cordially,

Jeff Prager
3591 Elliot Avenue
Minneapolis MN 55407
612-353-6045

The Office of the Inspector General of the United States Environmental Protection Agency
the White House and the White House Council on Environmental Quality and
the 1,000+ Deaths (1,003 - March 1, 2011 Approx.) That Have Resulted From
The Attack Of September 11th, 2001 All of Which
Have Occurred Since That Date



Impact of the September 11th Attack on Air Quality and Public Health in Lower Manhattan
Supplement To 'Report Docket No. NIOSH 227JP'
This Report is 'Report Docket No. NIOSH 227JP2'

March 15, 2011

Jeff Prager

This Report

This report, submitted to NIOSH under Docket Number NIOSH-227, Request for information on Conditions Relating to Cancer to consider for the World Trade Center Health Program and titled, "Report Docket No. NIOSH 227 JP2" uses publicly available data and references a previous report by the same author sent to NIOSH on March 14, 2011 titled, "Report Docket No. NIOSH 227 JP" and sent in PDF format to and received by Diane M. Miller, NIOSH Docket Officer, 513/533-8450 at dmm2@cdc.gov. The report was originally sent to: niocindocket@cdc.gov as requested.

Summary

This report in conjunction with the previous report mentioned above provides conclusive evidence that the events of September 11th, 2001 were nuclear in nature, that is, fission occurred in NYC on September 11th. The relationship to a variety of human cancers and radioactivity are well-known and well documented. This report summarizes those relationships and seeks to provide the necessary data such that all cancers associated with Ground Zero Rescue Workers included in any medical compensation package adopted by the US federal government, the National Institute for Occupational Safety and Health (NIOSH), the Centers For Disease Control and Prevention (CDC), related to the WTC Health Program established by the James Zadroga 9/11 Health and Compensation Act (Pub. L. 111-347) are completely and fully covered. This is, very simply, the right thing to do.

While this and the previous report submitted promote and espouse that radiation exposure was experienced, that conclusion is not necessary to or a part of the assertions in this 2nd report. This report is based, very simply, on the composition of the Ground Zero dust based on Scanning Electron Microscopy by the United States Geological Survey and posted to the internet as Open Source material and the belief that radiation was a component of the Ground Zero dust is *not relative* to the overall assertions in this second report.

Cover Photo © FEMA 2001 - Most rescue were not encouraged to wear respirators or breathing apparatus or even simple dust masks because the air was 'safe' to breathe based on EPA statements.

The EPA 9/11 pollution controversy was the result of a report released by the Office of the Inspector General of the United States Environmental Protection Agency in August 2003 which claimed that the White House put pressure on the EPA to delete cautionary information about the air quality in New York City around Ground Zero following the September 11, 2001 attacks. According to the report: a September 18 EPA statement saying that the air was “safe”¹ was made without sufficient reliable data available; the White House Council on Environmental Quality influenced the EPA to make reassuring comments to the public; and on September 12th the EPA Administrator issued a memo saying that all statements to the media must be cleared by the National Security Council.

Numerous key differences between the draft versions and final versions of EPA statements were found. A recommendation that homes and businesses near ground zero be cleaned by professionals was replaced by a request that citizens follow orders from NYC officials. Another statement that showed concerns about “sensitive populations” was deleted altogether. Language used to describe excessive amounts of asbestos in the area was altered drastically to minimize attention to the dangers it posed.²

The news of the report created a short-lived backlash against the administration. Especially angered were New Yorkers who lived near the site of the attacks. Even a year after 9/11 some 7,000 rescue workers were believed to be suffering from Ground Zero illness: respiratory ailments caused by the dust, the initial stages of various cancers and other related debilitating illness and to date 1,003 have died. Many cleaning efforts by government and private agencies on homes and businesses were accused of being inadequate.³

Senators Hillary Rodham Clinton and Joseph I. Lieberman sent a letter to President George W. Bush concerning his administration’s alleged intervention in internal EPA affairs.⁴

In an interview with Katie Couric for 60 Minutes, former EPA Administrator Christine Todd Whitman criticized NYC authorities for not forcing rescue workers to wear respirators, as EPA did not have the legal authority. She also defended her own record and denied the claim that her agency lied about air quality surrounding Ground Zero:

Whitman stated, “The last thing in the world that I would ever do would be to put people at risk. Of all the criticisms that I had in my career ... this is by far the most personally troubling. You want to say, ‘You’re wrong.’ We never lied.”⁵

However, Whitman’s claims were contradicted by Cate Jenkins, a senior scientist at the EPA. In a 2006 New York Times article, Jenkins claimed that the EPA outright lied about health hazards posed by alkalinity, or pH level, of the dust levels at Ground Zero.⁶

In September 2006 the US House of Representatives Committee on Homeland Security held a two day long hearing on the subject of illnesses caused by post-9/11 air quality.⁷ Whitman, the EPA, and New York City were targets of blame.⁷

1. “EPA Response to September 11”

http://www.epa.gov/oig/reports/2003/WTC_report_20030821.pdf

2. Laurie Garrett (2003-08-23). “EPA Misled Public on 9/11 Pollution

<http://www.commondreams.org/headlines03/0823-03.htm>

3. Francesca Lyman (Sept. 11, 2003). “Anger builds over EPA’s 9/11 report”

<http://www.msnbc.msn.com/id/3076626>

4. Senators and Past Administrator Speak Out on EPA Response to 9/11

<http://www.ombwatch.org/node/1578>

5. "Former EPA Head Blames NYC Officials". CBS News. 2006-09-07.

<http://www.cbsnews.com/stories/2006/09/07/60minutes/main1982332.shtml>

6. Anthony DePalma (2006-08-25). "E.P.A. Whistle-Blower Says U.S. Hid 9/11 Dust Danger"

http://www.nytimes.com/2006/08/25/nyregion/25toxic.html?_r=1

7. Devlin Barrett (2006-09-08). "EPA, NYC Blamed for 9/11 Health Problems"

<http://www.washingtonpost.com/wp-dyn/content/article/2006/09/08/AR2006090800234.html>

EPA's Office of the Inspector General

A report by the EPA's Office of the Inspector General released on August 21st states, among other criticisms, that the White House reviewed and even changed EPA statements about public health risks to make them sound less alarming. The report charges that the White House Council on Environmental Quality influenced "the information EPA communicated to the public through its early press releases when it convinced EPA to add reassuring statements and delete cautionary ones." The report cites "reopening Wall Street" and "national security" as reasons for the spin.

The EPA presented "an overriding message that there was no significant threat to human health" even though there was cause for caution, it concluded.

"When EPA made a September 18th announcement that the air was 'safe' to breathe, it did not have sufficient data and analyses to make such a blanket statement," said the OIG, adding that the agency was missing data on other pollutants, such as particulates and chemicals like PCBs. In addition, 25 percent of dust samples contained asbestos, a potent carcinogen.

Yes, Horinko admits, the EPA did find asbestos in the dust samples. "But the vast majority of the samples we took did not contain it," she says.

Asked about why people are still suffering ill effects, Horinko said she can understand that rescue workers would still be affected but finds residents' continued complaints to be "mystifying."

Sens. Hillary Clinton (D-NY) and Joseph Lieberman (D-CT) sent a critical letter to President Bush Aug. 26, asking why the administration conveyed incomplete information about air quality hazards in New York City immediately after 9/11. The letter comes shortly after the Environmental Protection Agency (EPA) Inspector General issued a report revealing the White House edited EPA public statements on air pollution to be more reassuring. As reported in an Aug. 25 OMB Watch article, the IG report outlines EPA's actions in response to the terrorist attacks of 9/11. The investigation found that the White House heavily edited EPA public communications, removing recommendations on home and office cleaning, references to dangers to high risk populations, and cautionary statements.

In their letter to Bush, Clinton and Lieberman expressed concern over the administration's actions, criticizing the White House handling of the situation. The senators called for several actions including the execution of a post-cleaning testing program at residences, implementation of a post-cleaning verification process at residences, and collaboration with Federal Emergency Management Agency (FEMA) and Occupational Safety & Health Administration (OSHA) to assess whether the testing and cleaning program should expand to Lower Manhattan workspaces.

The senators also requested information related to the press releases – the identification of White House officials involved in editing the EPA statements, the rationale for the editorial changes, and all communication between the White House and EPA concerning New York City air quality. They seek a response by Sept. 5. Both Senators serve on the Senate Clean Air, Wetlands and Climate Change Subcommittee, which held a hearing on February 11, 2002 to investigate issues of NYC air quality post 9/11.

In a letter to the Senate Environment and Public Works Committee Chairman James Inhofe (R-OK) on Sept. 4, Sens. Jim Jeffords (I-VT), Bob Graham (D-FL), Clinton and Lieberman requested a full committee hearing by Sept. 18 on the safety of indoor and ambient air quality in Lower Manhattan post 9/11.

In an interview with Newsweek, former EPA administrator Christine Todd Whitman said she did not disagree with the White House edits saying, “We didn’t want to scare people” and the more reassuring statements caused no harm. She denied that EPA was told to lie. Critics point to Whitman’s ties to Citigroup and Travelers Insurance, which saved millions in cleanup costs after Manhattan was pronounced safe, as a possible conflict of interest.



More than 350 dogs lent their snouts to 9/11 search-and-rescue (SAR) efforts at the World Trade Center and the Pentagon. Approximately 100 were deployed by FEMA, and the remaining 250 included SAR dogs from around the country, NY police dogs, security dogs and volunteers who rushed to the scene as soon as it happened. The University of Pennsylvania is conducting an ongoing study on the health of 9/11 SAR dogs. Of those 97 dogs who participated in the Penn study, 29 (29.9%) are no longer with us. Twelve (41%) have died of cancer, 2 were struck and killed by cars, and the remaining 15 died by unspecified causes.

TESTIMONY OF U.S. REPRESENTATIVE JERROLD NADLER (D-NY)

Submitted to

The Senate Committee on Environment and Public Works
Subcommittee on Clean Air, Wetlands, and Climate Change
February 11, 2002

Impact of the September 11th Attack on Air Quality and Public Health in Lower Manhattan

Thank you, Chairman Lieberman. I would like to thank you and Senator Clinton for holding this field hearing today, and for inviting me to testify, regarding the continuing impact of the September 11th attacks on the air quality in Lower Manhattan.

As the Congressman representing "Ground Zero" and the surrounding area, I am deeply concerned about the environmental and health effects posed by the collapse of the World Trade Center for my constituents, and for those who go to school or work in the area. It has now been exactly five months since the terrorist attacks and, unfortunately, the people in Lower Manhattan still do not know whether or not it is safe to live and work in the area. The Environmental Protection Agency (EPA) has failed in its mission to ". . .protect human health and to safeguard the natural environment . . ." by not exercising its full authority to test and clean all indoor spaces where people live and work. As such, the EPA has created a full-scale crisis of public confidence.

Yet, all is not lost. The EPA can and must act now to remedy this situation and make Lower Manhattan safe and to restore public trust. Despite statements to the contrary, the agency does currently have the authority and resources to do so, and it must do so quickly. However, if the EPA continues to fail New Yorkers, I will introduce legislation to mandate action.

I am going to begin by being very blunt. We now know enough to be alarmed and outraged at the federal government's response to the environmental impact of 9/11. First, we know that EPA Administrator Christine Todd Whitman misled the public on September 18th, 2001 when she said she was "glad to reassure the people of New York that . . .their air is safe to breathe, and their water is safe to drink." She made that statement without the indoor data necessary to make such a pronouncement. Second, we know that the EPA has made a series of conflicting comments about the presence and quality of hazardous materials, and has even knowingly withheld critical data regarding the causticity of the dust. Third, we know that the EPA delegated authority to New York City to handle indoor environments, but did nothing to ensure that the City's response was appropriate. This left New Yorkers to their own, uninformed devices, often without the means to take care of themselves and their families. This is true even as the EPA had its own building at 290 Broadway professionally tested and cleaned. And finally, we know that the EPA has treated New York differently than it has treated other locales contaminated by hazardous materials. New York was at the center of one of the most calamitous events in American history, and the EPA has essentially walked away.

Ms. Whitman's statement, reassuring the public about the safety of air and water, which has been echoed by many at all levels of government, was based only on the EPA's outdoor tests -- the results of which are still in dispute. At that time, there had been no systematic testing of indoor air or dust in residential or commercial buildings by any government agency, let alone by the EPA. In fact, the EPA did not intend to do testing even of outdoor air in residential areas of Lower Manhattan until my Ground Zero Elected Officials Task Force requested that it do so on September 21st. Ironically, the very first public testing conducted inside residences, which was commissioned by our Task Force, commenced on the very day Ms. Whitman made her misleading statement. The results were made available to the EPA on October 12th. The test results showed elevated levels of hazardous materials in these residences. The EPA did nothing and Ms. Whitman did not adequately clarify her statement.

In recent weeks, the EPA has stated repeatedly that the City of New York, not the EPA, is responsible for indoor testing. The City, however, didn't get around to testing inside homes until November and December. The full results of these tests are still not available and, according to the Health Department, won't be until the Spring. I do not understand why the results of tests undertaken by a public agency are being delayed for public release. Our test results took less than a month to be released. Nevertheless, just three days ago, the City Department of Health issued a press release regarding this limited indoor testing. Despite a pacifying headline, many of the limited data in the press release has caused the scientists with whom we've consulted to believe that full results would directly contradict Ms. Whitman's statement. The release does make it clear, as did our commissioned study, that there were disconcerting levels of hazardous materials in peoples' apartments.

Ms. Whitman's reassurances are deeply confusing in light of other statements made by agency officials and of other information we now have that the EPA has not itself released. For example, in a copy of a January 25, 2002 speech given by Walter Mugdan, EPA Region II counsel, which I have obtained, I find that he states, "... a significant number of the WTC bulk dust samples that we analyzed did have more than 1% asbestos." But an Oct 3rd 2001 EPA memo "Confirm[ing] No Significant Public Health Risk" states, "The vast majority of EPA and OSHA samples of air and dust analyzed for asbestos have been at levels that pose no significant risk to residents and workers returning to their homes or area businesses." This statement has been made repeatedly by EPA Region II officials. How are New Yorkers to interpret these conflicting remarks? I can't even tell you what they mean - except that they cannot both be true.

Confusing remarks are one thing, withholding critical data pertaining to the public health is another. We know that it took a Freedom of Information Act request by the New York Environmental Law and Justice Project to get test results showing dangerous levels of hazardous materials in outdoor ambient air. The EPA claimed that this was an "oversight." But now we have a new, frightening bombshell.

According to this Sunday's St. Louis Post Dispatch, the United States Geological Survey (USGS), using the country's best detection equipment and methods, found pH levels in World Trade Center dust that are "... as corrosive as drain cleaner" and passed this information along to health experts at the EPA on a "government-only" website. That's right. As corrosive as drain cleaner. (By the way, it took less than 2 weeks in September for these test results to be ready.) I submit this article for the record.

Andrew Schneider, the paper's Pulitzer Prize-winning environmental journalist, charges "the USGS data was not released by the EPA nor apparently were the environmental agency's own test results on the dust." The EPA claims to have released this data to the public, but when Schneider reviewed all of the EPA's statements made since 9/11, he found nothing that warned of these high pH levels. According to the New York Committee for Occupational Safety and Health (NYCOSH), such dust "once its in contact with moist tissue - the throat, the mouth, nasal passages, the eyes and even sweaty skin - it becomes corrosive and can cause severe burns." This is utterly scandalous. We must find out why the EPA hid this information from the public and we must see all the data now. I hope that Senators Clinton and Lieberman will join me in calling on the federal government to explain why New Yorkers were misled, and to demand the immediate release of the full complement of data.

The EPA has not only provided false reassurances and misleading information. The EPA has also abrogated its responsibility to act. In a statement issued on January 17th in response to a press conference I held, the EPA states that it, "has lead [sic] the effort to monitor the outdoor environment while the City of New York has taken the lead regarding the reoccupancy of buildings. " At least the EPA admits that it has delegated authority to the city. Unfortunately, the EPA has yet to provide any justification for doing so, nor has it provided any evidence of the oversight measures it is compelled to take to ensure that the city is acting in accordance with the strictest federal standards. On January 23rd, I sent a formal inquiry to Administrator Whitman asking for answers to these and other questions about the City's response, which I submit for the record today. It has been over three weeks since the letter was sent and I have yet to get a response.

The EPA might say today, as it has in the past, that it does not have the proper legal authority to take the steps we are requesting to test and clean the areas affected by the collapse of the World Trade Center. It will probably say that the Clean Air Act, for example, does not govern indoor air and that it is therefore the responsibility of the local and state governments, or even that of the landlords and residents themselves. This is, again, all utterly misleading.

Under Section 303 of the Clean Air Act, the EPA has the authority in an emergency situation to protect human health when there is an "imminent and substantial endangerment" presented by a source of pollution. The intent of Congress is clear in this regard. A Senate Report from 1970 on Section 303 states, "The levels of concentration of air pollution agents or combination of agents which substantially endanger health are levels which should never be reached in any community. When the prediction can reasonably be made that such elevated levels could be reached even for a short period of time – that is that they are imminent – an emergency action plan should be implemented." In short, the EPA should not wait for people to actually get sick before it acts, and it clearly has the authority to act under this law. Indeed, an EPA memo entitled "Guidance on the Use of Section 303 of the Clean Air Act" was issued to the Regional offices on September 15, 1983 outlining these very points. I submit a copy of this memo for the record.

But the Clean Air Act is not the only governing statute. The EPA has the authority to act on indoor air under the National Contingency Plan (NCP) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). In fact, I understand that the EPA has indeed been utilizing some of the NCP protocols at Ground Zero – however, they have not relied on this authority, or any other, to test or remediate indoor environments.

As we speak, the EPA is in fact doing indoor testing and remediation in Herculaneum, Missouri and other locales without Superfund designation. We must learn why the EPA is treating New York differently and I ask the Senators present here today to help me find out. This double-standard is unconscionable.

The EPA was unwilling to act on its own, and yet did nothing to ensure that those ostensibly charged with acting did "the right thing." The EPA, on its website and in public press releases referred residents to the New York City Department of Health, which recommended that people clean their potentially asbestos-laden dust with a "wet rag or wet mop." Clearly such cleanup measures are inadequate, as seen by the EPA's own actions taken in its building at 290 Broadway. I again today ask why the EPA applied stricter measures to federal buildings than the City advised for local residences and business equidistant from the World Trade Center.

Given the lack of action, credible information or oversight, I believe the EPA has failed in its responsibility to protect the public health of the citizens of Lower Manhattan. This is quite simply shameful, for public health is the first thing we, as a government, must protect.

In order to ensure a full and fair public assessment on the EPA's actions following September 11th, I have also asked the EPA National Ombudsman, Robert Martin, to investigate these matters. Mr. Martin has been doing so, and I am disappointed he has not been invited to testify and share the status of his investigation with the Committee. However, I understand there is a time constraint today, so I have attached a statement from Mr. Martin to be included in the record. As you may also know, Administrator Whitman is attempting to place the Office of the Ombudsman under the control of the Inspector General, effectively stripping the Ombudsman of his independence and ability to investigate these claims. I sincerely hope that Administrator Whitman will stop her quest to eviscerate the office of the Ombudsman, and in so doing, further undermining the integrity of the agency.

I realize that I have leveled serious charges here today, but I believe I have the moral responsibility to do so. The salient point is that we still do not know the extent of the presence of hazardous materials in some areas of the city. It may or may not be dangerous in many indoor areas of lower Manhattan – we just don't know. I am dismayed

that there seems to be an unwillingness on the part of our public agencies to get this information. But given that we do not have all of the facts, we cannot conclude anything. I do know that we must get the facts and act swiftly and appropriately to get the job done right.

We must not fall into the catch-22 of saying there is no evidence of a public health emergency without taking any steps to get such evidence. And the burden should not be on the landlords and residents themselves when the testing procedures and cleanup measures are expensive and must be conducted by properly trained personnel.

The EPA has the statutory and regulatory authority to test and remediate indoor environments in Lower Manhattan, and has exercised such authority elsewhere. I am calling on the EPA today to immediately commence a program of full-scale testing and remediation using the best available technology, and to make a report of all such test results and actions available to the public. The EPA must also issue the test results in a manner which is tied directly to health standards, so that we can truly assess the public health risk posed to the people of Lower Manhattan. And finally, testing procedures should in no way impede the expeditious remediation of hazardous materials found by other government agencies or private researchers. Similarly, should the EPA find dangerous levels of hazardous materials before the full spectrum of testing is completed, cleanup measures should commence immediately.

If the EPA fails to act again, despite its current authority, I will introduce legislation to compel it to do so.

People might say that the measures I am requesting here today are expensive. That may be, but we must protect the public health. And although the cost may be high today, imagine what the cost will be in the future if it turns out that there really are dangerous levels of hazardous materials in Lower Manhattan. Imagine the City's and EPA's contingent liability to lawsuits twenty years down the road. And envision the potential health care costs.

It is in the best interest of the residents, workers, students and businesses for the government to act swiftly and appropriately to address the public's environment and health concerns. We cannot afford to wait while all the agencies point fingers at each other. There is still time to right this situation.

And time is of the essence. My office has received numerous complaints from people experiencing adverse health effects such as headaches, nosebleeds, and respiratory ailments. The symptoms are so widespread that they have been dubbed "The World Trade Center Flu." Public confidence is at stake. People know when they are sick, they know when something is not right, and they know when they are being lied to. I sincerely hope that we do not have another "Love Canal" on our hands, but the best way to avoid that is to do the necessary testing and cleanup now.

Thank you for inviting me to testify before you today. I look forward to working with my colleagues in both chambers of Congress, and with all interested parties, to ensure that New York City is safe and prosperous for many years to come.

Myeloma and the Attack Of September 11th, 2001

As of March 13, 2011, there have been 134 deaths among First Responders that can be attributed directly to Myeloma. This means that of 40,000 total First Responders the death rate from Myeloma is 1 in 298.507 or rounded, 1 in 299.

In the general population the rate of Myeloma is 3.8 to 9.0 per 100,000 and 99% of those people afflicted with this rare blood plasma cancer are over 65 with an average age of 71.

The First Responders that have died from Myeloma were all between 37 and 60.

Obviously the incidence of Myeloma in First Responders is alarming, to say the least. Rather, it's simply unprecedented in human history. Not Hiroshima, nor Nagasaki, nor Chernobyl produced these dramatic figures and these figures are the product of only the first ten years beyond the events of 9/11. While the rates of myeloma in 9/11 responders is slightly higher than in the regular population, the most striking observation is the number of cases diagnosed in people under the age of 45. The rate of myeloma is 4 times higher than doctors would expect in this young age group.

These are extraordinary figures, unprecedented, and this report confirms why this is happening. Worse, there are approximately 8,000 currently sick First Responders today and many that have already died have succumbed to not one, not two, but sometimes 3 different rare cancers.

The CDC performed a study of nuclear industry workers titled, "Multiple Myeloma: A Study Of K-25 Workers". This study found that, "Workers who had swallowed or breathed-in radioactive particles had a 4% higher chance of dying of multiple myeloma compared to workers not exposed this way."

The study was initiated because, "Multiple myeloma is a rare type of cancer that starts in the bone marrow. Causes of this cancer are not known. Studies have been done to see if radiation exposure may cause this type of cancer in certain workers, such as radiologists, veterinarians, and uranium miners. The findings from these studies were not clear. Some found radiation exposure may cause multiple myeloma, others did. The K-25 site (also known as the Oak Ridge Gaseous Diffusion Plant) was used to enrich uranium, a radioactive material. Workers at K-25 may have been exposed to uranium. Because of this, we felt it was important to find out if workers from K-25 have a higher chance of dying of multiple myeloma."

In Hiroshima, it appears that the risk of developing malignant lymphoma and multiple myeloma is considerably greater in survivors who received 100 rad or more than in similar individuals exposed to less than one rad; when the period prevalence rate is standardized, the relative risks are 8.0 and 4.9 for malignant lymphoma and multiple myeloma respectively in highly exposed survivors, as opposed to persons who absorbed dosages of little or no biological significance. In this connection, it should be noted that the morphological material available for review in these cases is approximately equally divided between diagnostic lymph node biopsies and the autopsy series. The presence of a similar dose-response relationship in these 2 essentially independent sources of case material is felt to be very important in excluding possible bias in biopsy referrals, autopsy procurement, etc. In contrast to the foregoing data, a comparable increased risk of developing malignant lymphoma or multiple myeloma is not evident among the heavily exposed Nagasaki survivors, although the total number of individuals in each exposure category is too small to permit a definitive statement.

There's a plausible explanation for this. The physical characteristics of the 2 bombs employed in August, 1945 were dissimilar: the Hiroshima bomb was a Uranium-235 device which emitted a balanced spectrum of neutrons and gamma rays at most exposure gradients, while the Nagasaki bomb was composed of Plutonium-238 and emitted predominantly gamma rays. Therefore, at a given dose estimate, Nagasaki inhabitants were exposed relatively

to more gamma rays than Hiroshima residents who absorbed a radiation mixture consisting of gamma rays and neutrons.

Multiple Myeloma (MM) and Exposure to Ionizing Radiation

Center for Environmental Health Studies
44 Farnsworth Street, Boston, MA 02210
(617) 482-9485
<http://www.jsi.com>

Studies conducted at the Los Alamos National Laboratory and other nuclear facilities, as well as those exposed to radiation from the atomic bomb suggest an increased likelihood of developing multiple myeloma for those who have been exposed to ionizing radiation. These findings are consistent with the determination of the National Research Council's BEIR V committee that multiple myeloma has been associated with exposure to ionizing radiation. Multiple myeloma is a "specified" cancer under the EEOICPA. Historically, multiple myeloma incidence and mortality in Los Alamos County fall in the middle of New Mexico counties while Rio Arriba County is among counties with the highest rates in the state. Incidence means new cases of cancer, while mortality means deaths due to cancer.

The incidence of Myeloma among Ground Zero First Responders and Rescue Workers
is 1 in 299

Across a Population of 40,000 First Responders

Findings of Human Health Research Studies

Human health research studies compare the patterns of disease among groups of people with different amounts of exposure to a suspected risk factor. Below are results reported from such studies of multiple myeloma among people exposed to ionizing radiation.

All of these studies found increases and possible increases in multiple myeloma (MM) among certain groups of exposed workers. Statistically significant is a term used to mean that the connection between the health outcome and the exposure was strong enough that it was unlikely to be due to chance. The research included incidence studies, which look at new cases of cancer. These can track health more quickly and accurately than mortality studies of deaths due to cancer. Adding to the strength of the findings is that increasing rates of MM were observed with higher doses in some studies.

Studies of Los Alamos National Laboratory (LANL) Workers

Research conducted of LANL workers provides the most direct evidence about possible relationships between a health problem and workplace exposures at LANL.

Study of Four DOE Sites: LANL contributed 37 cases of multiple myeloma to a case-control study at four DOE sites. All together, the rate of death due to MM increased with increasing whole body dose of radiation received between age 40 and 50.

Studies of Other Nuclear Workers in the United States

The next most relevant evidence comes from studies of workers in similar occupations with the same types of exposures. Listed below are studies that looked at multiple myeloma and workplace exposures among nuclear

workers in other parts of the United States.

Hanford: A possible increase in MM deaths was observed in 35,000 males employed between 1943 and 1972, and then followed through 1972. In later studies, this finding has depended upon the assumptions used in the analysis. Under certain assumptions, there are increasing rates of death due to MM with increasing doses of external radiation.

Mallinckrodt, St. Louis: A possible increase in deaths from MM was observed in a study of 2,514 males who were employed between 1942 and 1966, and then followed through 1993.

Oak Ridge Y-12: The disease category of "other lymphatic cancer," which includes MM (ICD 203), showed a possible increase in deaths in a study of 8,116 workers who were employed between 1947 and 1974, and then followed through 1990. 24

Studies of Other Nuclear Workers World-Wide

Below are studies of nuclear workers outside of the United States that looked at multiple myeloma in connection with radiation exposures.

Sellafield, England: A possible increase in deaths was observed due to MM in a study of 5,203 plutonium workers who were employed between 1947 and 1975, and then followed through 1992. A possible increase was seen in incidence between 1971 and 1986 in plutonium workers. In a study of 14,327 workers who were monitored for external radiation during this time period, there were increasing rates of death due to MM with increasing doses of external radiation. The researchers who conducted the study wrote: "This may represent a true radiation effect."

3 Nuclear Workforces in England: Increasing rates of death due to MM were found with increasing time since first being monitored for plutonium in a study of 12,498 workers.

Registry of Nuclear Workers in the U.K.: Increasing rates of death due to MM were found with increasing doses of external radiation in a study of 95,000 workers.

Studies of Other Ionizing Radiation Exposures

Studies among other groups of people who were not nuclear workers can also be significant as evidence of possible increases in multiple myeloma among those who have been exposed to ionizing radiation. Most other research has been conducted of people exposed to atomic bombs.

Atomic Bomb Survivors: Increasing deaths due to multiple myeloma with increasing doses of radiation in a study of 86,572 A-bomb survivors.

Other Research and Policy Findings

The National Research Council advises the U.S. government on scientific matters. Their Committee on Biological Effects of Exposure to Ionizing Radiations (BEIR) V reviewed sensitivity of parts of the body to radiation. Their findings are based mostly on studies of cancer among atomic bomb survivors, as well as on some of the available information on the biology of the body, animal studies, and other evidence. The greatest risk is at high exposure levels.

According to the National Research Council's BEIR V committee, "[t]he incidence of multiple myeloma has been

observed to be elevated after widespread irradiation of the bone marrow in the majority of populations studied to date.”

Is Multiple Myeloma a “Specified” Cancer Under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA)?

Yes. Multiple myeloma is a “specified” cancer under the EEOICPA consideration of Special Exposure Cohorts

Policy makers have identified certain types of cancer among energy employees at nuclear facilities, including those employed at Los Alamos National Laboratory, as being potentially related to occupational exposures under the EEOICPA.

What Are Other Risk Factors for Multiple Myeloma?

In considering the risks of occupational exposure to ionizing radiation leading to multiple myeloma, it is important to understand other risk factors. Below is a list of other suspected risk factors for multiple myeloma. Children and brothers and sisters of patients who have this disease have a slightly increased risk.

Hazardous chemicals. Farmers and petroleum workers exposed to certain chemicals also seem to have a higher-than-average chance of getting multiple myeloma.

These factors may add to any risk due to workplace exposure to ionizing radiation. Most multiple myeloma patients are between 50 and 70 years old. This disease affects blacks more often than whites and men more often than women. Smoking has not been found to be related to multiple myeloma.

Rates of Multiple Myeloma in Exposed Counties

Los Alamos County

There have been moderate rates of multiple myeloma reported in Los Alamos County for both cancer incidence and mortality. Los Alamos County:

- Ranked 19th in incidence of multiple myeloma and
- 19th in mortality among the 33 counties in New Mexico from 1970 to 1996.
- In recent years there has been about one case per year in the county.

Rio Arriba County

There have been very high rates of multiple myeloma reported in Rio Arriba County for both cancer incidence and mortality. Rio Arriba County:

- Ranked 5th highest in incidence of multiple myeloma and
- Highest in mortality among the 33 counties in New Mexico from 1970 to 1996.

How Radiation Affects Cells

Ionizing radiation is energy transmitted via X rays, gamma rays, beta particles (high-speed electrons), alpha particles (the nucleus of the helium atom), neutrons, protons, and other heavy ions such as the nuclei of argon, nitrogen, carbon, and other elements. X rays and gamma rays are electromagnetic waves like light, but their energy is much higher than that of light (their wavelengths are much shorter). Ultraviolet (UV) light is a radiation of intermediate energy that can damage cells (the well known sunburn), but UV light differs from the forms of electromagnetic radiation mentioned above in that it does not cause ionization (loss of an electron) in atoms or molecules, but rather excitation (change in energy level of an electron). The other forms of radiation--particles--are either negatively charged (electrons), positively charged (protons, alpha rays, and other heavy ions), or electrically neutral (neutrons).

Ionization

As an example of ionization, beta rays are fast electrons that lose energy as they pass through cells and interact with molecules. The transferred energy is high enough to disrupt chemical bonds, which results in radical formation (or ionization). Ionization differs from the ion formation that occurs in ordinary chemical reactions. The process that takes place when salt (sodium chloride, NaCl) is dissolved in water is a good example of an ordinary reaction. Sodium and chloride bind together because, separately, each atom is unstable. The sodium (Na) atom has only one electron in its outermost orbit, and loss of that electron makes it more stable. In contrast, the chloride (Cl) atom has seven electrons in its outermost orbit and gaining one electron to have a full complement of eight outer electrons makes it more stable. When the two atoms bind to form NaCl, sodium shares its single outer electron with chloride, and so, both are stable. In ordinary chemical reactions, such as the binding of Na to Cl, electrons that are lost or gained are always those on the outermost orbit. When NaCl is dissolved in water, the two atoms separate, with chloride keeping the extra outer electron; thus, the sodium has a net positive charge (hence Na⁺) and the chloride has a net negative charge (hence Cl⁻), but the net charge (balance between positive and negative) remains neutral. These charged atoms are called ions, and they are stable in water despite their electrical charges.

In contrast, when an electron passes through a cell, it releases its energy along its path (called a track) by interacting with the electrons of nearby molecules. The released energy is absorbed by atoms near the track, resulting in either excitation (a shift in the orbit of an electron to a higher energy level) or ionization (release of an electron from the atom). What differs from an ordinary chemical reaction is that when radiation donates energy to atoms or molecules, electrons other than those on the most outer orbit can be released, which makes the atoms very unstable. Such unstable atoms are called radicals and are chemically very reactive. Some radicals are so reactive that they exist only for as short a time as a microsecond.

X and gamma rays differ from beta particles in that they release high-speed electrons from atoms first. Positively charged particles transfer energy to molecules in cells by essentially the same mechanisms. Neutrons are somewhat different since they are electrically uncharged, and their main effect is to impact the nuclei of hydrogen atoms, namely protons. Since the masses of a neutron and a proton are similar, the impact results in an elastic scattering process like in billiards. The ejected protons behave as charged particles.

How Ionizations Affect Cells

Radiation-induced ionizations may act directly on the cellular component molecules or indirectly on water molecules, causing water-derived radicals. Radicals react with nearby molecules in a very short time, resulting in breakage of chemical bonds or oxidation (addition of oxygen atoms) of the affected molecules. The major effect in cells is DNA breaks. Since DNA consists of a pair of complementary double strands, breaks of either a single strand or both strands can occur. However, the latter is believed to be much more important biologically. Most

single-strand breaks can be repaired normally thanks to the double-stranded nature of the DNA molecule (the two strands complement each other, so that an intact strand can serve as a template for repair of its damaged, opposite strand). In the case of double-strand breaks, however, repair is more difficult and erroneous rejoining of broken ends may occur. These so-called mis-repairs result in induction of mutations, chromosome aberrations, or cell death.

Characteristics Of DNA Damage By Radiation Exposure

Deletion of DNA segments is the predominant form of radiation damage in cells that survive irradiation. It may be caused by (1) mis-repair of two separate double-strand breaks in a DNA molecule with joining of the two outer ends and loss of the fragment between the breaks or (2) the process of cleaning (enzyme digestion of nucleotides – the component molecules of DNA) of the broken ends before rejoining to repair one double-strand break.

Biological Effects Differ By Type Of Radiation

Radiations differ not only by their constituents (electrons, protons, neutrons, etc.) but also by their energy. Radiations that cause dense ionization along their track (such as neutrons) are called high-linear-energy-transfer (high-LET) radiation, a physical parameter to describe average energy released per unit length of the track. Low-LET radiations produce ionizations only sparsely along their track and, hence, almost homogeneously within a cell. Radiation dose is the amount of energy per unit of biological material (e.g., number of ionizations per cell). Thus, high-LET radiations are more destructive to biological material than low-LET radiations – such as X and gamma rays – because at the same dose, the low-LET radiations induce the same number of radicals more sparsely within a cell, whereas the high-LET radiations – such as neutrons and alpha particles – transfer most of their energy to a small region of the cell. The localized DNA damage caused by dense ionizations from high-LET radiations is more difficult to repair than the diffuse DNA damage caused by the sparse ionizations from low-LET radiations.

Solid Cancer Risks Among Atomic-Bomb Survivors

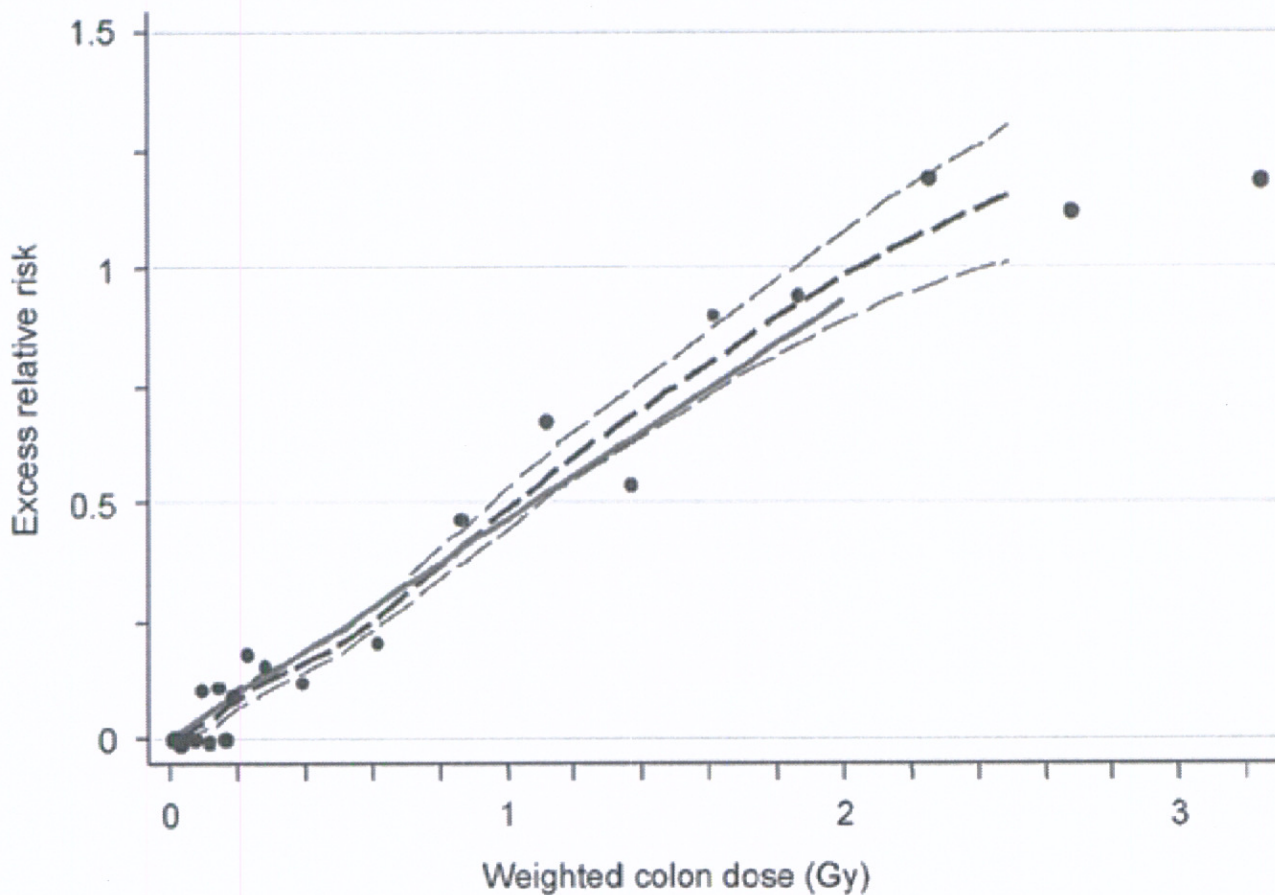
Increased risk of cancer is the most important late effect of radiation exposure seen in A-bomb survivors. For cancers other than leukemia (solid cancers), excess risk associated with radiation started to appear about ten years after exposure. This was first noted by a Japanese physician, Gensaku Obo, in 1956, and it led to continuing comprehensive analyses of cancer mortality and to the creation of tumor registries by the city medical associations in both Hiroshima and Nagasaki.

For most solid cancers, acute radiation exposure at any age increases one's cancer risk for the rest of life. As survivors have aged, radiation-associated excess rates of solid cancer have increased as well as the background rates. For the average radiation exposure of survivors within 2,500 meters (about 0.2 Gy), the increase is about 10% above normal age-specific rates. For a dose of 1.0 Gy, the corresponding cancer excess is about 50% (relative risk = 1.5).

Tumor registries were initiated in 1957 in Hiroshima and 1958 in Nagasaki. During the period from 1958 to 1998, 7,851 malignancies (first primary) were observed among 44,635 LSS survivors with estimated doses of >0.005 Gy. The excess number of solid cancers is estimated as 848 (10.7%) (Table). The dose-response relationship appears to be linear, without any apparent threshold below which effects may not occur (Figure 1 next page).

Figure 1: Excess risk of developing solid cancers in LSS, 1958-1998

Weighted colon dose (Gy)	LSS subjects	Cancers		Attributable risk
		Observed	Estimated excess	
0.005 - 0.1	27,789	4,406	81	1.8%
0.1 - 0.2	5,527	946	75	7.6%
0.2 - 0.5	5,935	1,144	179	15.7%
0.5 - 1.0	3,173	688	206	29.5%
1.0 - 2.0	1,647	460	196	44.2%
>2.0	564	185	111	61.0%
Total	44,635	7,851	848	10.7%



LSS solid cancer incidence, excess relative risk by radiation dose, 1958-1998. The thick solid line is the fitted linear sex-averaged excess relative risk (ERR) dose response at age 70 after exposure at age 30. The thick dashed line is a non-parametric smoothed estimate of the dose category-specific risks and the thin dashed lines are one standard error above and below this smoothed estimate.

The probability that an A-bomb survivor will have a cancer caused by A-bomb radiation (excess lifetime risk) depends on the dose received, age at exposure, and sex. Figure 2 represents excess relative risk and excess absolute risk (sex-averaged) exposed to 1 Gy. Both expressions of excess risk indicate that higher risks are associated with younger age at exposure. Other analyses (not shown) indicate that females have somewhat higher risks of cancer from radiation exposure than males do.

References About This Subject:

1. Preston DL, Shimizu Y, et al.: Studies of mortality of atomic bomb survivors. Report 13. Solid cancer and non-cancer disease mortality: 1950-1997. *Radiation Research* 2003; 160:381-407
2. Preston DL, Ron E, et al.: Solid cancer incidence in atomic bomb survivors: 1958-1998. *Radiation Research* 2007; 168:1-64
3. Preston DL, Pierce DA, et al.: Effect of recent changes in atomic bomb survivor dosimetry on cancer mortality risk estimates. *Radiation Research* 2004; 162:377-89
4. Ron E, Preston DL, et al.: Cancer incidence in atomic-bomb survivors. Part IV: Comparison of cancer incidence and mortality. *Radiation Research* 1994; 137:98-112

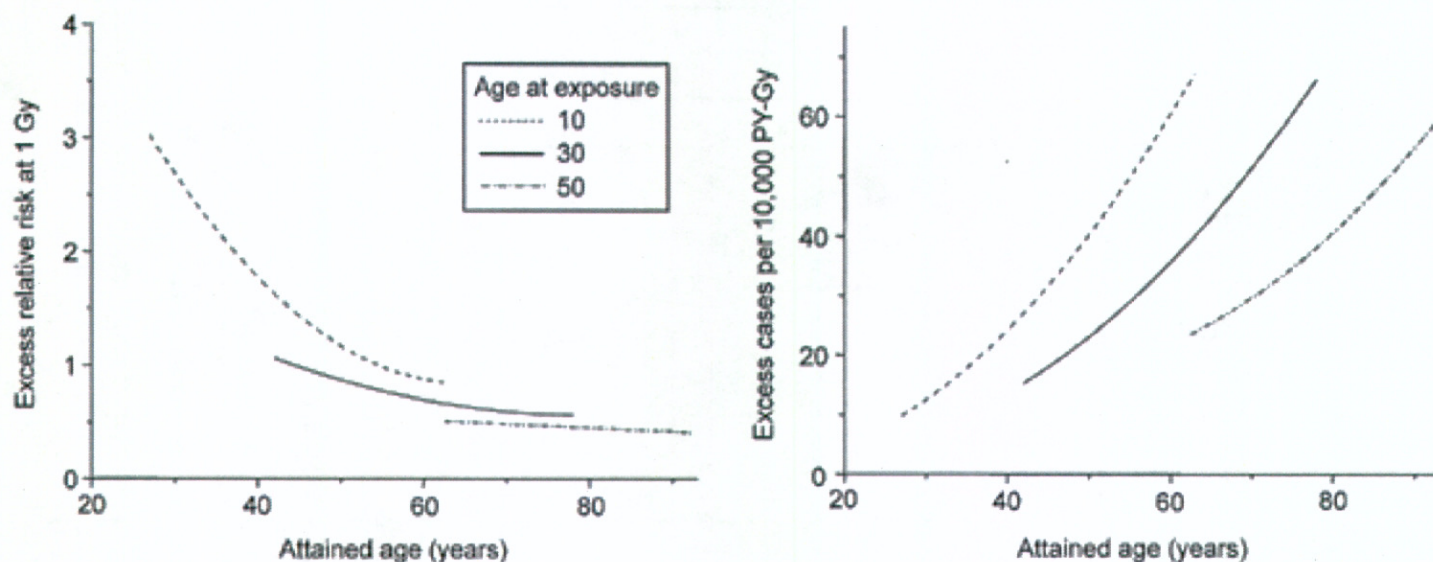


Figure 2. Effects of age at exposure and attained age on the excess risk of solid cancer (incidence) following exposure to 1 Gy. Left panel represents excess relative risk (ERR) and the right panel excess absolute risk (EAR).

Site-Specific Cancer Risks Among Atomic-Bomb Survivors

Significant excess risks are seen for many of the major types of solid cancer, including cancers of the stomach, lung, liver, colon, bladder, breast, ovary, thyroid, and skin. Although not always statistically significant, excess risks are also seen for most other types of cancer. Thus, the survivor data are consistent with the notion that radiation is associated with excess risks for virtually all cancers. Since site-specific risks can differ by sex and age at exposure, Figure 1 adjusts for such differences and compares risks among sites by presenting sex-averaged data showing the risk at age 70 after exposure at 30 years of age. Under these conditions, the excess relative risk value (ERR) for all solid cancers combined is 47% following exposure to 1 Gy. While differences in site-specific risks are apparent, the range of variation is not statistically significant, partly because the numbers of cancer cases at given sites are limited.

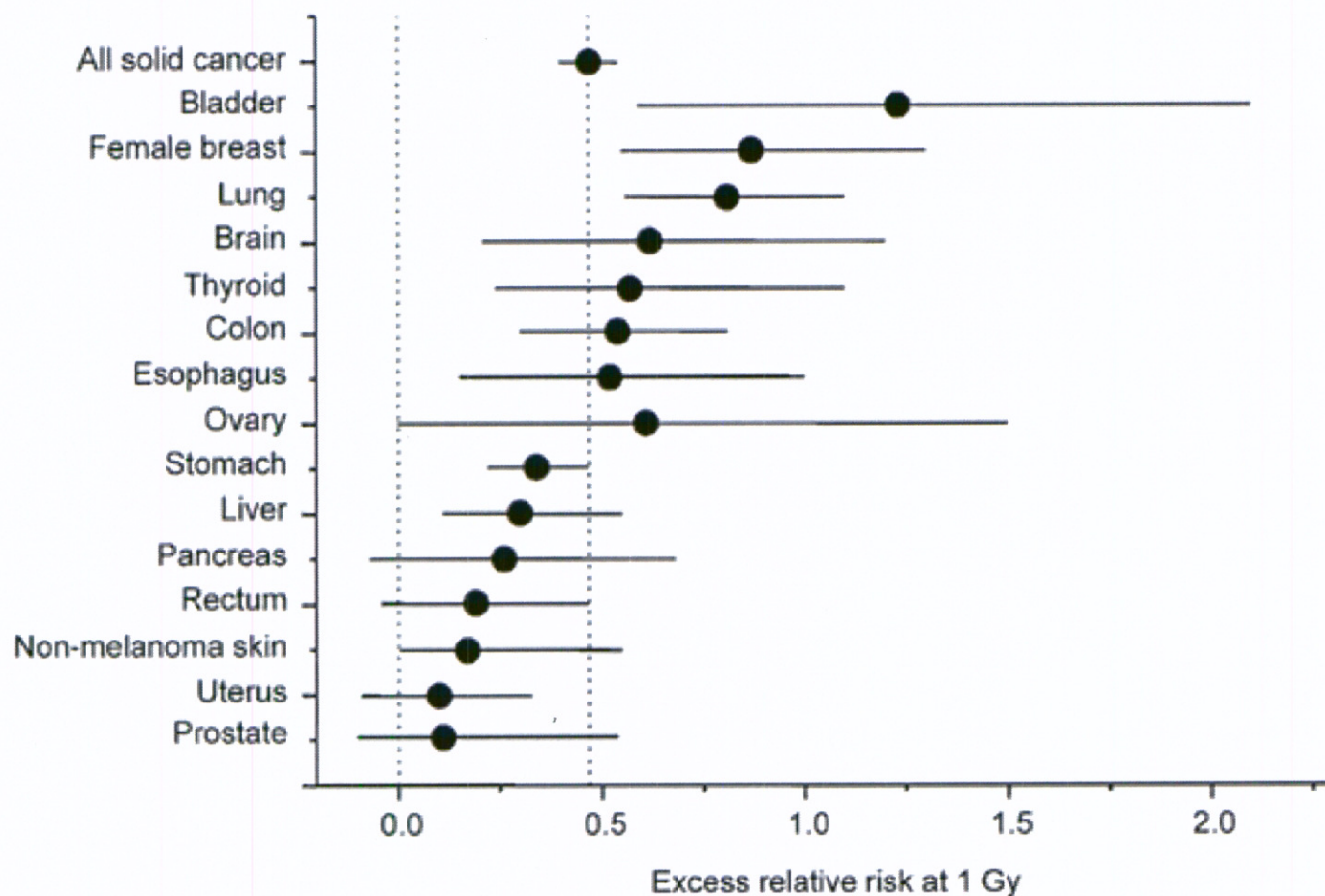
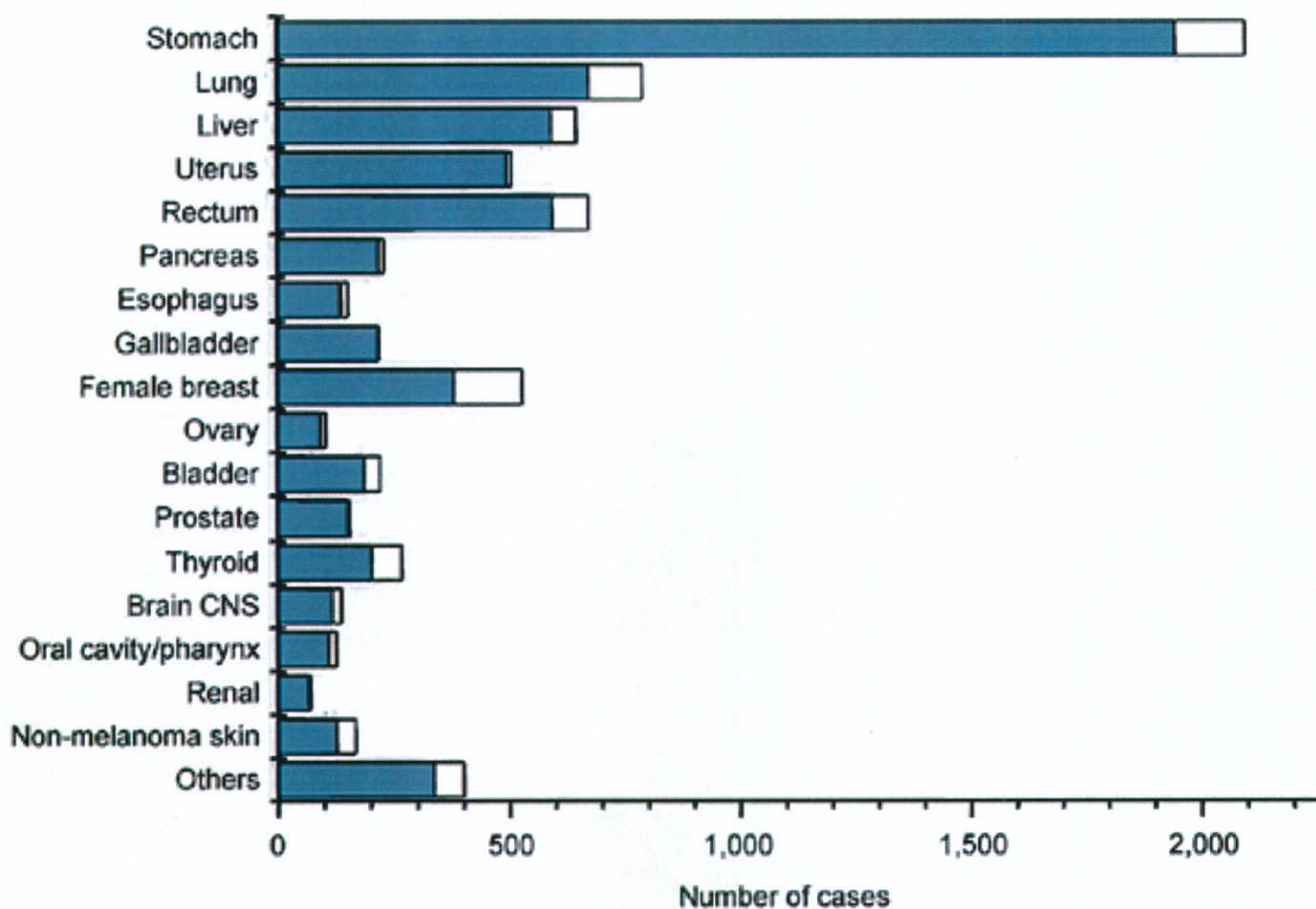


Figure 1. Excess relative risk per Gy for the incidence of site-specific cancers in the LSS cohort. The risk is standardized as exposure at 30 years of age (sex-averaged) and diagnosed at age 70. The horizontal bars indicate 90% confidence intervals.

Figure 2 (next page) presents similar site-specific data in terms of attributable risk (i.e., what percent of total cases are associated with radiation). The largest excess number of cases (given in parentheses) were for cancers of the stomach (150), female breast (147), lung (117), rectum (78), thyroid (63), and liver (54).

Figure 2. Number of site-specific cancer cases occurring in the exposed group (≥ 0.005 Gy), 1958-1998. The white portion indicates excess cases associated with radiation.



Analyses of site-specific cancer incidence data are often superior to those of cancer mortality studies. This is because incidence studies provide better diagnostic information and are better able to assess the occurrence of less fatal cancers, such as thyroid and skin. For all solid cancers combined, the excess relative risks were comparable for incidence (47% excess per Gy) and mortality (42%), but the excess absolute risk was 1.9 times greater (52 versus 27 excess cases per 10,000 person-years per Gy, respectively).

Reference To This Subject:

Preston DL, Ron E, et al.: Solid cancer incidence in atomic bomb survivors: 1958-1998. *Radiation Research* 2007; 168:1-64

Leukemia Risks Among Atomic-Bomb Survivors

Excess leukemia was the earliest delayed effect of radiation exposure seen in A-bomb survivors. Japanese physician Takuso Yamawaki in Hiroshima first noted an increase of leukemia cases in his clinical practice in the late 1940s. This led to the establishment of a registry of leukemia and related disorders and to the initial reports on elevated leukemia risks published in the early 1950s.

Risks for radiation-induced leukemia differ in two major respects from those for most solid cancers. First, radiation causes a larger percent increase in leukemia rates (but a smaller number of cases since leukemia is relatively rare, even in heavily exposed survivors), and second, the increase appears sooner after exposure, especially in children. The excess leukemias began appearing about two years after radiation exposure, and the excess peaked

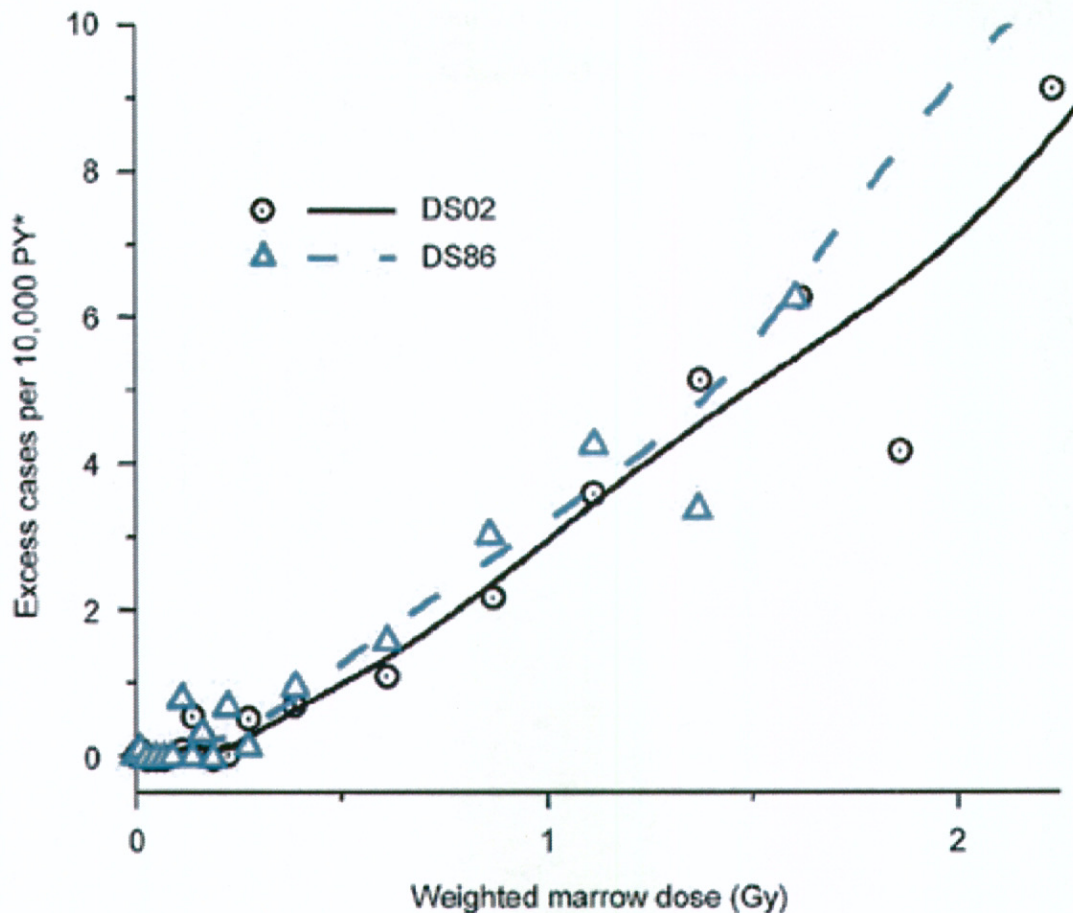
at about 6-8 years after exposure. Today, little if any excess of leukemia is occurring.

Because the Life Span Study (LSS) cohort was based on the 1950 national census, quantitative descriptions of leukemia risks in A-bomb survivors have been based on cases diagnosed from that year on. As of the year 2000, there were 204 leukemia deaths among 49,204 LSS survivors with a bone marrow dose of at least 0.005 Gy, an excess of 94 cases (46%) attributable to A-bomb radiation (Table). In contrast to dose-response patterns for other cancers, that for leukemia appears to be nonlinear; low doses may be less effective than would be predicted by a simple linear dose response. Even for doses in the 0.2 to 0.5 Gy range, however, risk is elevated (Figure 1).

Table. Observed and estimated excess number of leukemia deaths in LSS population, 1950-2000

Table. Observed and estimated excess number of leukemia deaths in LSS population, 1950-2000

Weighted marrow dose (Gy)	Subjects	Deaths		Attributable risk
		Observed	Estimated excess	
0.005 - 0.1	30,387	69	4	6%
0.1 - 0.2	5,841	14	5	36%
0.2 - 0.5	6,304	27	10	37%
0.5 - 1.0	3,963	30	19	63%
1.0 - 2.0	1,972	39	28	72%
>2.0	737	25	28	100%
Total	49,204	204	94	46%



PY = person-years, in this case the number of excess leukemias per 10,000 persons per year

Figure 1 (above). DS02 and DS86 non-parametric dose response of leukemia, 1950-2000. Shown is the sex-averaged risk in 1970 for exposure age 20-39.

Leukemia risk among LSS survivors has been increased only for acute and chronic myelocytic leukemias and for acute lymphocytic leukemia. No evidence of increased risk is seen for adult T-cell leukemia (endemic in Nagasaki but virtually non-existent in Hiroshima) or for chronic lymphocytic leukemia, which, in marked contrast to western countries, is extremely rare in Japan. As in solid cancer risks, the leukemia risk also largely depends on the age at exposure (Figure 2). The different age effect involves different types of leukemias; acute lymphoblastic leukemia is more common among young people whereas chronic myelogenous leukemia and acute myelogenous leukemia are more common among elderly people.

Figure 2 (next page). Effects of age at exposure and attained age on the excess deaths from all types of leukemia (1-Gy exposure)

Because leukemia is a rare disease, the absolute number of leukemia cases among A-bomb survivors is relatively small even though the relative risk is high. Leukemia accounts for only about 3% of all cancer deaths and fewer than 1% of all deaths, although it presently constitutes about 16% of all excess LSS cancer deaths from radiation exposure. In an unexposed Japanese population, the lifetime risk of leukemia is about seven cases per 1,000 people. For typical survivors in the LSS, who received 0.005 Gy or greater (a mean dose of about 0.2 Gy), the lifetime leukemia risk increases to about 10 cases per 1,000 (or the relative risk is nearly 1.5).

References About This Subject:

1. Preston DL, Pierce DA, et al.: Effect of recent changes in atomic bomb survivor dosimetry on cancer mortality risk estimates. *Radiation Research* 2004; 162:377-89

2. Preston DL, Kusumi S, et al.: Cancer incidence in atomic-bomb survivors. Part III: Leukemia, lymphoma, and multiple myeloma, 1950-1987. *Radiation Research* 1994; 137:S68-97

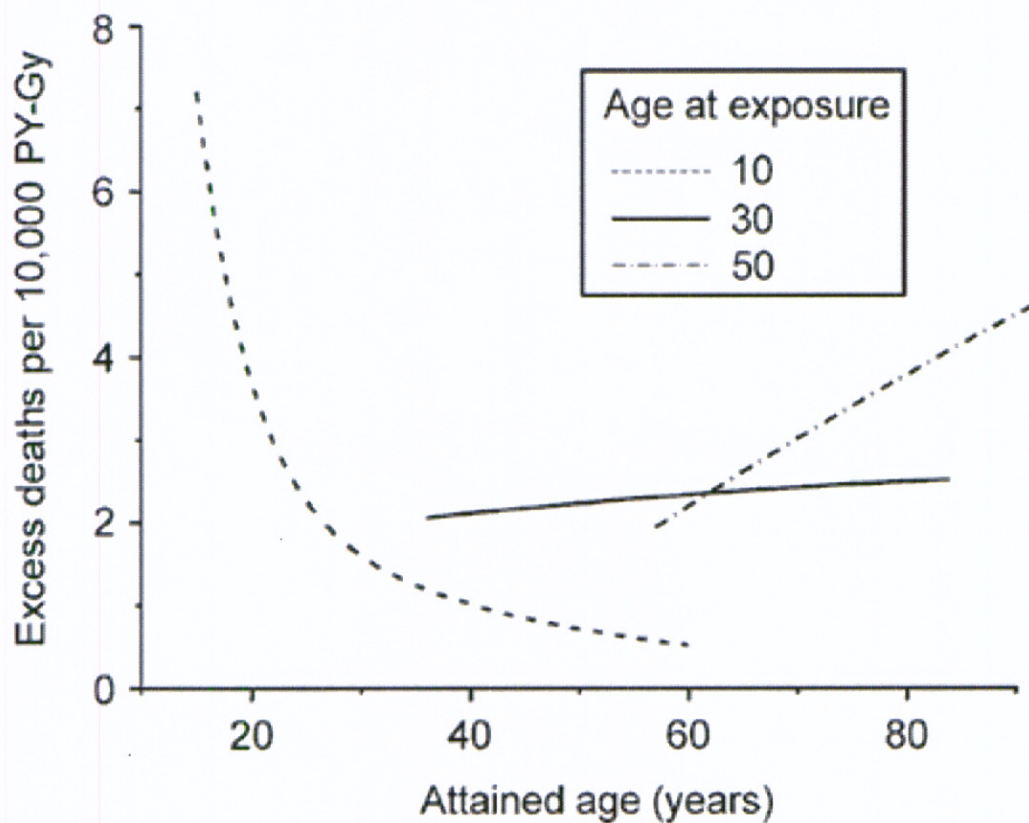


Figure 2 (above)

Deaths Due To Non-Cancer Disease

Analyses of the Life Span Study (LSS) mortality data (1950-1997) show a statistically significant dose-response pattern for death from diseases other than cancer. The excess does not seem limited to any particular disease. Among the 49,114 LSS survivors with colon doses of at least 0.005 Gy (DS86), 18,049 non-cancer deaths occurred (excluding deaths attributed to diseases of the blood). Circulatory diseases account for nearly 60% of these deaths, with digestive diseases, including liver diseases, and respiratory diseases accounting for about 15% and 10%, respectively.

Aside from diseases of the blood, the number of excess non-cancer deaths associated with A-bomb exposure is estimated at 150 to 300 cases. The death rate following exposure to 0.2 Gy (the mean radiation dose for the 49,114 survivors with doses >0.005 Gy) is increased by about 3% over normal rates. This is less than the death rate increase for solid cancers, where corresponding increases are 7% in men and 12% in women (age 30 ATB). The dose-response pattern is still quite uncertain (Figure 1 next page).

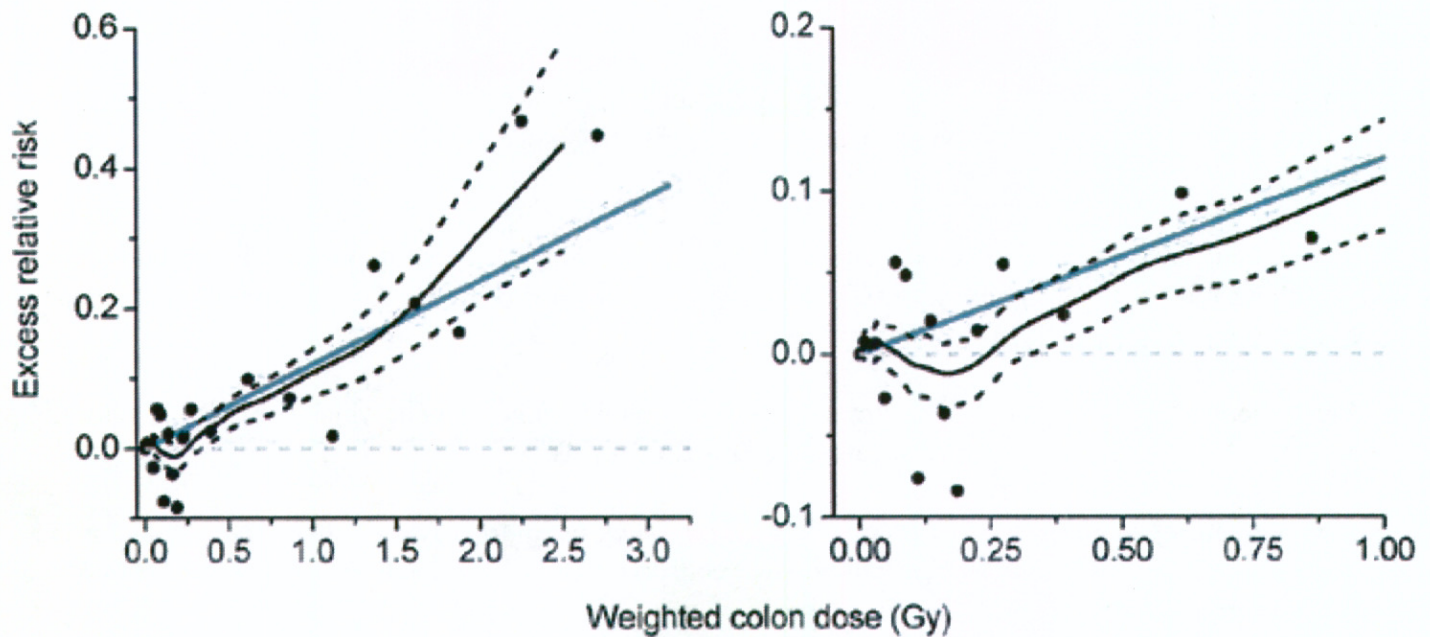


Figure 1. Non-cancer dose-response function for the period 1968-1997 (DS86). The solid straight line indicates the fitted linear ERR model without any effect modification by age at exposure, sex or attained age. The points are dose category-specific ERR estimates, the solid curve is a smoothed estimate derived from the points, and the dashed lines indicate upper and lower one-standard-error bounds on the smoothed estimate. The right panel shows the low-dose portion of the dose-response function in more detail.

A significant radiation dose-response pattern was also seen for non-cancer blood diseases. Such diseases were studied separately since they may represent various hematologic malignant or premalignant conditions. Among the 128 deaths for which medical records were available and in which hematologic reviews were performed, about 45% were clearly classified as non-neoplastic blood diseases, 6% were diagnosed as leukemia or other hematopoietic cancers, and the remainder were potentially preneoplastic.

In the absence of known biological mechanisms, it is important to consider whether these results might be due to biases or to diagnostic misclassification of cancer deaths. Investigations have suggested that neither of these factors can fully explain the findings, especially for circulatory diseases that have been investigated more fully.

Myeloma, 9/11 & The Medical Community Response

Years after the September 11 attacks on the World Trade Centers, researchers are still trying to determine if there is an increased rate of myeloma in 9/11 responders.

Early responders to the site, including emergency, reconstruction, and rescue workers and volunteers, would have had the highest levels of exposure to the toxic dust cloud. Within weeks of the tragedy, medical screening of 9/11 responders began. Many were noted to have health issues, breathing problems and coughs, as well as psychological trauma. These have become widely acknowledged side effects from exposure at the Ground Zero site.

Through the medical screening programs, a number of 9/11 responders have been diagnosed with myeloma. While the rates of myeloma in 9/11 responders is slightly higher than the regular population, the most striking observation is the number of cases diagnosed in people under the age of 45. The rate of myeloma is 4 times higher than doctors would expect in this young age group. Myeloma is typically a disease of older persons, occurring at

the average age of 71.

Myeloma is a blood cancer that involves the over-production of plasma cells, the antibody-producing cells that develop from B-lymphocytes in the bone marrow. Myeloma is also called multiple myeloma or plasma cell myeloma.

When plasma cells are exposed to a foreign substance, or antigen, they have the unique ability to create and excrete antibodies, or immunoglobulins, to help the body fight off infection. Immunoglobulins are proteins made up of heavy chains (G,A,M,D or E) and light chains (kappa or lambda).

In myeloma, there are mutations in the DNA of a single B-lymphocyte/plasma cell, which then begins to multiply out of control. These cancerous plasma cells are called myeloma cells.

As these malignant myeloma cells reproduce uncontrollably, they begin to crowd the bone marrow and prevent it from doing its normal job of producing healthy white cells, red cells and platelets. This leaves the patient with fewer cells to carry oxygen to their organs, form blood clots, or fight infection.

In addition, the myeloma cells will continue to produce the same immunoglobulins as the original cancerous cell. This leads to an excessive amount of one type of immunoglobulin (Ig), such as IgG or IgA being created. This abnormal immunoglobulin is unable to function like a normal antibody and help to fight infection. The accumulation of one type of immunoglobulin is called monoclonal protein (M-protein).

The myeloma cells will also invade bone tissue, causing damage and areas of weakness in the bone. Plasma cells and myeloma cells release chemicals called cytokines, which also contribute to bone destruction. As a result, myeloma patients will often have characteristic bone damage called osteolytic lesions.

Sources

1. Kyle, Robert and Rajkumar, S. Vincent "Multiple Myeloma" *Blood* 15 March 2008 111:2962-2972.
2. Lin, Pei "Plasma Cell Myeloma" *Hematology/ Oncology Clinics of North America* 2009 23:709-727.
3. Nau, Konrad and Lewis, William "Multiple Myeloma: Diagnosis and Treatment" *American Family Physician* 1 October 2008 78:853-859.



The White House put pressure on the EPA to delete cautionary information about the air quality in New York City around Ground Zero following the September 11, 2001 attacks. According to the report: a September 18 EPA statement saying that the air was “safe”¹ was made without sufficient reliable data available; the White House Council on Environmental Quality influenced the EPA to make reassuring comments to the public; and on September 12th the EPA Administrator issued a memo saying that all statements to the media must be cleared by the National Security Council.

This First Responder is NOT wearing proper breathing apparatus because proper breathing apparatus were not required based on US government statements through the National Security Council.

“First, we know that EPA Administrator Christine Todd Whitman misled the public on September 18th, 2001 when she said she was “glad to reassure the people of New York that... their air is safe to breathe, and their water is safe to drink.”



The White House put pressure on the EPA to delete cautionary information about the air quality in New York City around Ground Zero following the September 11, 2001 attacks. According to the report: a September 18 EPA statement saying that the air was “safe”¹ was made without sufficient reliable data available; the White House Council on Environmental Quality influenced the EPA to make reassuring comments to the public; and on September 12th the EPA Administrator issued a memo saying that all statements to the media must be cleared by the National Security Council.

The First Responders pictured here are NOT wearing proper breathing apparatus because proper breathing apparatus were not required based on US government statements through the National Security Council.

“First, we know that EPA Administrator Christine Todd Whitman misled the public on September 18th, 2001 when she said she was “glad to reassure the people of New York that...their air is safe to breathe, and their water is safe to drink.” Photo © FEMA 2001 Open Source Image



The White House put pressure on the EPA to delete cautionary information about the air quality in New York City around Ground Zero following the September 11, 2001 attacks. According to the report: a September 18 EPA statement saying that the air was “safe”¹ was made without sufficient reliable data available; the White House Council on Environmental Quality influenced the EPA to make reassuring comments to the public; and on September 12th the EPA Administrator issued a memo saying that all statements to the media must be cleared by the National Security Council.

This First Responder is NOT wearing proper breathing apparatus because proper breathing apparatus were not required based on US government statements through the National Security Council.

“First, we know that EPA Administrator Christine Todd Whitman misled the public on September 18th, 2001 when she said she was “glad to reassure the people of New York that...their air is safe to breathe, and their water is safe to drink.”

Photo © FEMA 2001 Open Source Image



The White House put pressure on the EPA to delete cautionary information about the air quality in New York City around Ground Zero following the September 11, 2001 attacks. According to the report: a September 18 EPA statement saying that the air was “safe”¹ was made without sufficient reliable data available; the White House Council on Environmental Quality influenced the EPA to make reassuring comments to the public; and on September 12th the EPA Administrator issued a memo saying that all statements to the media must be cleared by the National Security Council.

Some of the First Responder pictured are NOT wearing proper breathing apparatus because proper breathing apparatus were not required based on US government statements through the National Security Council.

“First, we know that EPA Administrator Christine Todd Whitman misled the public on September 18th, 2001 when she said she was “glad to reassure the people of New York that...their air is safe to breathe, and their water is safe to drink.” Photo © FEMA 2001 Open Source Image

The Extremely CAUSTIC Nature of the Ground Zero Dust

There is another source of caustic agents that would have raised the pH in the dust: the radioactive oxides of Calcium, Barium, Strontium and Zinc produced by the nuclear fission and decay. These oxides all form an alkaline solution on contact with water. We have seen that the jet fuel could not possibly have calcined enough concrete to turn the dust caustic. The shock wave itself from the nuclear blast would not calcine the concrete either, but there were eyewitness accounts of the pyroclastic dust “sizzling” as it passed, so evidently the dust was at a high temperature – whether it was hot enough to have calcined the concrete we don’t know at this time.

However, if we say that the intense volcanic heat was localized to the sub-basement levels under the tower, coming from the molten core of some type of nuclear event, and that this heat had no effect on the majority of the dust from the disintegrating towers, the radioactive fallout in the dust would be caustic.

Therefore, the caustic nature of the dust could yet be another indication that the towers were subjected to a nuclear explosion. We can certainly agree we would expect to find caustic dust, caused by the presence of alkali forming oxides of the common nuclear fission products – Barium, Strontium, Zinc and also Calcium.

There is overwhelming evidence that extraordinarily high temperatures were produced during the collapse of the World Trade Center and that they persisted for weeks if not months after the collapse.

University of California at Davis Aerosol Analysis

The UC Davis DELTA Group (Detection and Evaluation of Long-range Transport of Aerosols) is a collaborative association of aerosol scientists at several universities and national laboratories in the United States. The DELTA Group has measured aerosols’ emissions from the 1991 Gulf War oil fires, volcanic eruptions, global dust storms and the Asian smogs.

The head of the DELTA Group is Professor Thomas Cahill, who due to his background in nuclear physics is an international expert in atmospheric sciences and the properties of aerosols.

From October 2nd, 2001 until mid-December 2001, a volunteer research team from the DELTA Group monitored the levels of atmospheric particles and aerosols in the atmosphere of New York, following the collapse of the World Trade Center.

An automated particle collection system was set up on the roof of 201 Varick Street, one mile north-northeast of the World Trade Center site. On February 11th, 2002, Professor Cahill gave a press conference to describe some of his findings. He made the following comments, quoted here from the UC Davis press release:

“The air from Ground Zero was laden with extremely high amounts of very small particles, probably associated with high temperatures in the underground debris pile. Normally, in New York City and in most of the world, situations like this just don’t exist.”

He further stated:

“Even on the worst air days in Beijing, downwind from coal-fired power plants, or the Kuwait oil fires, we did not see these levels of very fine particulates.”

The amounts of very fine particles, particularly very fine silicon, decreased sharply during the month of October.

“The US Davis DELTA Group’s ability to measure and analyze particle size, composition and time continuously, day and night, is unequalled. There were numerous events when bursts of wind lasting 6 to 8 hours carried unprecedented amounts of very fine particles to the sampling site. In the largest spike, the DELTA Group analysis found 58 micrograms per cubic meter of very fine particles in one 45-minute period – “an extremely high peak” Cahill said.

Metals

Many different metals were found in the samples of very fine particles, and some were found at the **highest levels ever recorded** in air in the United States.

However, there are few established safety guidelines for airborne metals. One metal for which there is a guideline, lead, was present at low levels in fine and very fine particles.

Some of the metals for which there are no guidelines that were present in very fine particles in relatively high concentrations were Iron, Titanium (some associated with powdered concrete), Vanadium, Nickel (often associated with fuel-oil combustion), Copper and Zinc. Mercury was seen occasionally in fine particles but at low concentrations. Many of those metals are widely used in building construction, wiring and plumbing. Some are common in computers. The metal of the coarse particles is still being analyzed.

What are these small very fine particles that Cahill was making such a point about? How could a metal aerosol be produced? Very high temperatures would be required indeed.

Very small particles are particularly dangerous since they can bypass the bodies natural defence mechanisms and if breathed in, enter directly into the bloodstream. They can also pass through HEPA filters, the finest grade of gas mask available and they can even enter the body through the skin. They are a serious hazard.

Anything with a diameter of less than 2.5 millionths of a meter is to be considered dangerous for these reasons.

The press release further states:

*“There are no established safe limits for inhaled very fine particles. The closest reference is the US EPA “PM2.5” standard, which limits the allowable mass of airborne particles 2.5 micrometers to (0) Zero micrometers. That standard is based on health studies of typical air samples, in which very fine particles are a small fraction of the total mass. In contrast, in the World Trade Center dust samples analyzed at UC Davis, the **very fine particles** are a **large fraction of the total mass.**”*

So we can understand that Professor Cahill would want to draw attention to the fine particulates for health and safety reasons. But is there more to it?

Prof. Cahill also explained the meaning of the generation of the particles to reporters more clearly:

*“The presence of coarse particles immediately after days of rain indicated that they **were being continually re-generated** from a dry, hot source, not re-suspended from roadways and other surfaces.”*

Cahill's words: “Continually Regenerated.”

“The very fine particles were high in a number of species generally associated with combustion of fuel oil – such as Sulfur, Vanadium and Nickel, and incineration of plastics and other organic matter.”

*“There were also an unusual, very fine, silicon-containing aerosol. This latter type of aerosol can be produced only by **very high temperatures**, including **vaporisation of soil and glass.**”*

“We had seen this previously, but at much lower concentrations, in the plumes of coal-fired power plants in the EPA BRAVO study in Texas, the burning oil fields of Kuwait, and Beijing during the winter coal heating season.”

“In the case of metals, we saw many different species in the very fine particles. Most, including Lead and Mercury, were at low concentrations at our site, but some, such as Vanadium, were the highest that we have seen recorded.”

This is very important. Cahill was saying that the ground under Ground Zero was so hot that the soil itself was vaporized. Glass was not just being melted, but boiled away – and this was still happening weeks later. Even after rain had dampened down the site, these aerosols were being regenerated by the intense underground heat sources. An Ongoing Fission Process.

The presence of Vanadium is very interesting. Cahills comment about Vanadium and Nickel being associated with the combustion of fuel oil, plastics or organic matter is completely incorrect and draws immediate attention to this incongruity. Sometimes people tell little white lies.

Where would this Vanadium have come from – the highest concentration they had ever seen? Vanadium is not a common element and certainly not a common component of skyscrapers.

Quoted from Cahill’s PowerPoint file:

1. Initial fires and collapse-derived “dust storm”
2. Continuing emissions from the debris piles

Both cases shared the unusual aspect of a massive ground level source of particulate matter in a highly populated area with potential health impacts.

Why do we care about very fine ($0.26 > D_p > 0.09 \mu\text{m}$) aerosols?

EPA (AAAR, 10/2002) summarized 5 causal factors most likely to explain the statistically solid data connecting fine PM_{2.5} aerosols and human health.

1. Biological aerosols (bacteria, molds, viruses...)
2. acidic aerosols
3. very fine/ultra fine ($< 0.1 \mu\text{m}$) insoluble aerosols
4. fine transition metals
5. high temperature organics

Four of the five reached unprecedented ambient levels in the very fine aerosol plumes from the WTC collapse piles

On most days, the plumes lofted above NYC so that only those on or near the WTC site breathed these aerosols.

Problems:

We see very fine aerosols typical of combustion temperatures far higher than the WTC collapse piles. We see some elements abundantly and others hardly at all, despite similar abundances in the collapse dust. We see organic

species in the very fine mode that would not survive high temperatures.

Explanation

The hot collapse piles are converting some species to gasses that can escape to the surface of the piles and then form aerosols, a process that yields very fine particles.

Where Did The Vanadium Come From?

We've seen previously that Vanadium is a decay product of radioactive fallout. It is associated with Nickel and Chromium in its decay series. The graph (next page), from Cahill's report, shows that on the 3rd of October a high spike of Vanadium was detected, 60 ng/m^3 . On the 26th of October there was a massive spike in the concentration of Chromium which goes off the scale (over 150 ng/m^3) and to a lesser extent Nickel. Vanadium, Chromium and Nickel are radioactive decay products from the same decay pathway. It is interesting that on the 3rd and 4th of October, the spikes in Vanadium concentration are accompanied by Silicon spikes, but on the 26th the enormous Chromium/Nickel spike is not matched by the Silicon or Sulfur. Whatever happened on the 26th of October must have been a major event of some kind, to create this enormous Chromium emission without the normal building materials present. We can speculate that on the 26th of October, 2001, perhaps the core, the location where fission was still active, was exposed, allowing high amounts of Chromium and Nickel to escape into the atmosphere.

Stainless Steel

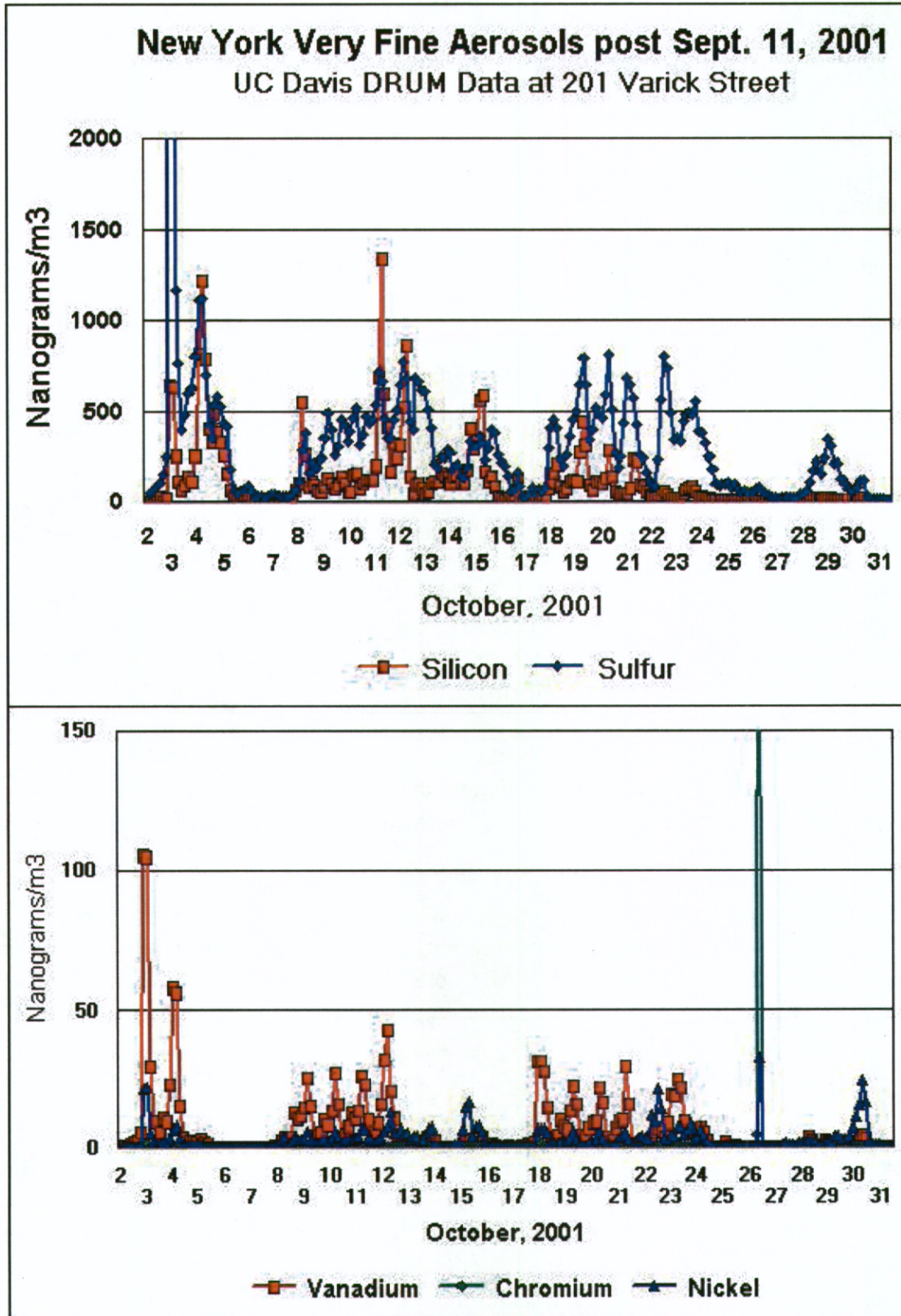
These spikes recorded by Cahill of Chromium, Nickel and to a lesser extent Vanadium are also interesting from another point of view. Surrounding the fissile core of a nuclear device is an enormous amount of stainless steel. The pressure vessel itself is normally made of stainless steel 6 inches thick. For reactors, all of the cooling pipes, heat exchangers and condensers carrying coolant water are made of stainless steel. As an example, the Indian Prototype Fast Breeder Reactor (PFBR) contains about 3300 tonnes of stainless steel in its core material and accessories, not including the steam turbines. The main element alloyed with steel to create stainless steel is Chromium. Normally, between 9% and 12% of Stainless Steel is Chromium. Other major alloying elements include Nickel, Vanadium, Molybdenum and for specialized nuclear applications, Titanium and Zirconium. In fact, the single biggest industrial use of Nickel is in the manufacture of stainless steel. Given the extremely high temperatures that we know existed below the rubble, high enough to continually vaporize soil and glass, and the existence of molten pools of steel, it can be hypothesized that the enormous Chromium and Nickel spike on the 26th of October may have been caused by the vaporization of a pool of stainless steel, exposed by recovery operations on that day. If the temperature reached over 700 degrees C at the surface, it would have been substantially higher below. We know that the underground temperatures were high enough to vaporize glass. The boiling point of Silicon Dioxide is 2230 degrees C, which would be achievable underground if the surface temperature were 700 degrees C. The boiling point of steel is about 2800 degrees C, which is about the same as the melting point of Uranium or the temperature expected in the core melt of a reactor melt-down. Even if the molten steel was not boiling, it would still vaporize at the temperatures we know existed of over 2000 degrees C. The evidence that glass was being vaporized strongly supports the possibility that stainless steel, if it was present, was also being vaporized.

Diphenyl

An interesting observation is made in the New Scientist article on the following page. Of the 400 organic compounds detected after the collapse, many have never been detected in the air before. One of these rare, never before seen compounds detected by the EPA was diphenyl propane. Where did the diphenyl come from?

Mixtures of diphenyl and diphenyl oxide have been used as the coolant for certain nuclear reactors – organic solvent cooled reactors. Diphenyl apparently never became as popular as water as a reactor coolant mainly due to

the sensitivity of these solvents to radiation. If diphenyl is so rare, that the EPA have never seen it as an air pollutant before, its presence may provide evidence that a diphenyl cooled nuclear reactor was under the towers or that some new and advanced form of nuclear devices were used.



New Scientist.com

Two Years after the terrorist attacks on the World Trade Center in New York City, which claimed almost 3000

lives, researchers have gathered to assess the legacy of the giant plume of smoke and dust caused by the atrocity.

The makeup of the plume was unique in its chemical composition and unprecedented in its complexity. As a result, no one yet knows the health effects of breathing them in and therefore how many more people may have been affected by the collapse of the Twin Towers.

“This was a fully functional building that was completely smulched into a burning pit,” says Thomas Cahill, an atmospheric physicist at the University of California Davis, who has focused on the composition of the finest particles in the plume for the past two years.

“That’s never happened before, so we are in completely new territory. All we can say is we are worried about it,” he says. *“It may take years before these effects show up, just like with radiation,”* stated Cahill.

“just like with radiation,” stated Cahill.

Astonishing Complexity

The gathering Wednesday at the American Chemical Society’s meeting in New York was the first time chemists, atmospheric physicists and doctors from over 20 US institutions had got together to pool their results.

Paul Liroy, of the Univeristy of Medicine and Dentistry of New Jersey, emphasized to the meeting the sheer diversity of chemicals that were present in the dust. A mixture of plastics, computer hardware, synthetic furniture and hundreds of miles of wire burned to produce an aerosol of astonishing complexity. Out of 400 organic alkanes, pthalates and polyaromatic hydrocarbons he identified, the majority had never before been detected in the air, he says.

One such compound, detected by researchers from the Environmental Protection Agency, was Diphenyl Propane, thought to have come from burning plastic. The health consequences of breathing it are totally unknown, says EPA scientist Leonard Stockburger.

Scientists from the US Geological Survey showed that even among the well-known molecules and crystals, new shapes of particles were thrown up by the plume. *“They detected fibrous, cylindrical materials, which have a totally different behavior to spherical particles,”* says Michael Hays of the EPA, who attended the meeting. *“How does that influence inhalation routes?”*

But the scientists were careful to be clear about their message. *“We don’t want people to get the wrong impression. For long term effects, we are simply in an area of unknowns,”* says Liroy.

Next, the chemists hope to produce a map of exactly what was in the air and when in the weeks and months after the September 11th attacks. Then, if people develop symptoms, the doctors will know exactly what they were likely to have inhaled. The New York City Department of Health launched a survey last Friday that will follow the health of up to **200,000 people** who were in the vicinity of the Twin Towers when they collapsed. Some evidence of ongoing effects has already surfaced. A study published in August showed that pregnant women who were near Ground Zero on September 11th or up to three weeks later were **twice as likely to give birth to smaller babies** as women who were not.

Note: reduced birth weight of neonates is a well known symptom of exposure to radiation.

NY Air Hazards
EPA Assurances Contradicted by UCD Scientists

Dr. Cahill, a 65 year old professor emeritus of physics and atmospheric sciences has used his background in nuclear physics to pioneer methods and tools for analyzing aerosols – tiny particles suspended in the air – and has led more than 40 studies on pollution around the world, including several in national parks and in the basins of Lake Tahoe and Mono Lake.

The Ground Zero monitoring showed the fallout had subsided by late December, when Cahill's team stopped sampling. He said rain probably has cleared the air outside, but he is concerned about New Yorkers returning to contaminated buildings.

“These size particles travel like a gas. They penetrate windows, doors, everywhere,” he said. *“You don't feel it, and you can't see it.”*

Cahill is whistleblowing here, with his comment that these gas-like aerosol particles *“penetrate windows, doors”* and that you cannot see it or feel it. Is this not an exact description of radiation? In fact, a gas could not pass through glass windows or through the structure of a door – the only thing that can penetrate in that way is radiation. Cahill was hinting strongly as he dare that the fallout is radioactive, to people that can decipher what he means. In the New Scientist article, he has also commented that the effects will be long term, *“just like radiation”*.

Here are more revealing extracts:

*“The September 11th collapse of the 110-story skyscrapers crushed concrete, glass, computers, electrical wiring, carpeting, furniture and everything else in the building, then burned and **broiled** the compressed pulverized mass for weeks. In the **super-heated** rubble the material disintegrated into extremely small particles, which were released into the air for weeks. It's like having a large power plant at ground level with no stack,”* said Cahill.

By Cahill's own assessment, the super-heated core of the building, buried under a giant pile of rubble with little to no oxygen, created a pressure cooker that broiled the concrete, glass, computers and everything else into infinitesimally small particles that were exuded in a gassy, lingering haze. The article goes on to quote Bruce case, former Head of the EPA's Center for Environmental Epidemiology;

“This was a unique event in many ways and one of those ways was the types of human exposure produced.”

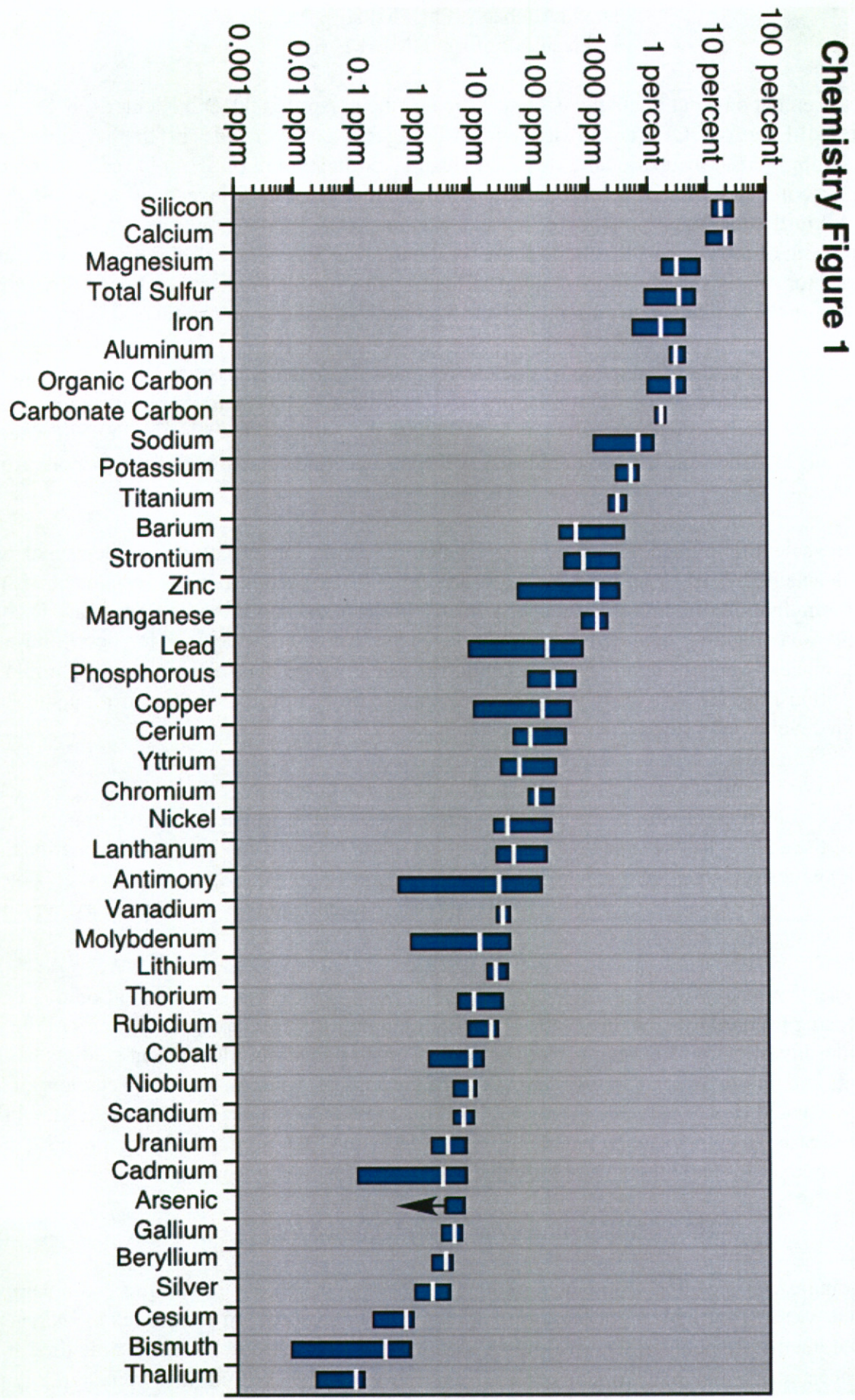
The emphasis on Asbestos turned out to be misplaced.

Case predicted that the health fallout from the World Trade Center attack will continue indefinitely. *“Regrettably,”* he said, *“what we have here is a human experiment on a grand scale.”*

Chart 1: Composition of Ground Zero Dust from the USGS - Minimum, Maximum and Mean

Chemistry Table 1, continued				
	minimum	maximum	mean*	
Silicon %	11.4	26.3	14.8	
Calcium %	9.58	26.01	18.36	
Magnesium %	1.79	6.94	2.88	
Sulfur %	0.87	5.77	3.11	
Iron %	0.55	4.13	1.63	
Aluminum %	2.27	4.13	2.90	
Carbon, organic %	0.98	4.02	2.48	
Carbon, Carbonate %	1.24	1.89	1.55	
Sodium %	0.12	1.16	0.57	
Potassium %	0.28	0.69	0.50	
Titanium %	0.21	0.39	0.26	
Manganese %	0.07	0.19	0.11	
Phosphorous %	0.01	0.05	0.02	
Loss on Ignition %	7.96	22.8	16.35	
Barium ppm	317	3670	533.38	
Strontium ppm	378	3130	726.61	
Zinc ppm	57.4	2990	1004.70	
Lead ppm	9.13	756	166.75	
Copper ppm	10.3	438	136.31	
Cerium ppm	50.9	356	91.23	
Yttrium ppm	30.2	243	57.45	
Chromium ppm	86.5	224	116.61	
Nickel ppm	22.6	202	37.77	
Lanthanum ppm	25.8	175	45.96	
Antimony ppm	0.56	148	24.84	
Vanadium ppm	24.9	42.5	30.67	
Molybdenum ppm	0.85	42	11.34	
Lithium ppm	17.4	36.4	24.00	
Thorium ppm	5.36	30.7	9.31	
Rubidium ppm	8	25.2	19.01	
Cobalt ppm	1.7	13.9	6.36	
Niobium ppm	4.4	11	8.34	
Scandium ppm	4.4	9.8	6.63	
Uranium ppm	1.96	7.57	3.29	
Cadmium ppm	0.11	7.5	2.80	
Arsenic ppm	3.5	6.8	***	
Gallium ppm	2.8	6	4.15	
Beryllium ppm	1.8	4.2	2.96	
Silver ppm	0.96	3.8	1.66	
Cesium ppm	0.18	0.88	0.64	
Bismuth ppm	0.008	0.82	0.28	
Thallium ppm	0.02	0.13	0.08	

Chart 2: USGS Concentration in Solid - Percent and PPM - Major and Trace Elements



Beryllium's Public Relations Problem:
Protecting Workers When There Is No Safe Exposure Level

David Michaels, PhD, MPH
Celeste Monforton, MPH

In a dramatic announcement on a national television news magazine in April 2000, Bill Richardson, Secretary of the U.S. Department of Energy (DOE), acknowledged that his agency collaborated with the beryllium industry to defeat a 1975 attempt by the Occupational Safety and Health Administration (OSHA) to reduce workers' exposure to beryllium, a collaboration that was brought to public attention in a 1999 investigation by Toledo Blade reporter Sam Roe. "Priority one was production of our nuclear weapons," Richardson stated. "[The] last priority was the safety and health of the workers that build these weapons." The Secretary's declaration was remarkable; rarely do the most senior officials in government admit deception that resulted in death and disability of its own citizens. Yet, for those in the public health community, the Secretary's candid announcement was long overdue.

Scores of workers employed in the production of nuclear weapons had been diagnosed with chronic beryllium disease (CBD), a progressive and irreversible inflammatory lung disease, and there was increasingly powerful evidence that CBD was associated with exposure at levels below the permissible exposure limit in place at the time. In response to this evidence, the beryllium industry waged a concerted campaign to delay a more protective workplace exposure standard.

Eventually, when the scientific evidence became so great that it was no longer credible to deny that workers developed CBD at levels permitted by an outdated exposure limit, the beryllium industry responded with a new rationale to delay promulgation of a more protective standard. In the television interview, Secretary Richardson described how DOE was changing course, lowering the level that triggered protection for beryllium-exposed workers in the U.S. nuclear weapons complex from 2.0 $\mu\text{g}/\text{m}^3$ to 0.2 $\mu\text{g}/\text{m}^3$. The agency's new Chronic Beryllium Disease Prevention Program was designed to provide further protection for workers from a substance so insidious that no safe level of exposure has ever been established.

The DOE rule covers only workers employed in the nuclear weapons complex. Although OSHA has acknowledged the inadequacy of its present workplace beryllium exposure standard, which generally applies to workers in the private sector, the agency has not updated it. Researchers at the National Institute for Occupational Safety and Health (NIOSH) have estimated that there are between 28,000 and 107,000 private-sector workers potentially exposed to beryllium in the U.S.; all but 1,500 of these workers are employed outside the primary beryllium industry.

This case study presents a history of the knowledge and public policy concerning the prevention of beryllium-related disease, focusing primarily on the role of the U.S. beryllium industry in shaping the policies of the regulatory system. A similar investigation has been performed in the United Kingdom. The present study is based on a review of documents and on the personal knowledge of one of the authors, who, as Assistant Secretary of Energy for Environment, Safety and Health, directed the agency's efforts to issue a stronger beryllium exposure limit and develop a program to provide compensation payments to workers with CBD. Some of the documents cited were obtained from government files and others were provided by attorneys who obtained them in litigation.

The First Beryllium Workplace Exposure Limit

The first significant industrial use of beryllium occurred in the 1930s, in the production of fluorescent lamp tubes. Soon after the metal was first introduced, at least 45 workers from fluorescent lamp factories in Massachusetts developed a form of chemical pneumonitis now known as acute beryllium disease (ABD); some died from the disease. It quickly became apparent that workers could not safely work with beryllium without respiratory protec-

tion. Beryllium's importance grew dramatically with the Manhattan Project — the secret initiative to construct atomic weapons — and the subsequent growth of the nuclear weapons industry, fueled by the Cold War. This lightweight metal is a vital component of nuclear weapons. Beryllium slows down the speed of neutrons released when the uranium atom is split in the atomic chain reaction; this action facilitates the splitting of more atoms, thereby increasing a weapon's power or "yield."

External Link:

<http://www.defending-science.org/David-Michaels-bio.cfm>

Beryllium At Ground Zero And Lower Manhattan

The charts on the previous pages (Charts 1 and 2, USGS) show Beryllium levels for Lower Manhattan of from 1.8ppm to 4.2ppm with an average of 2.96ppm.

Final Report on Carcinogens
Background Document for Beryllium and Beryllium Compounds
December 16 - 17, 1999
Meeting of the NTP Board of Scientific Counselors Report
on Carcinogens Subcommittee

Prepared for the U.S. Department of Health and Human Services
Public Health Service National Toxicology Program

Prepared by Technology Planning and Management Corporation

Durham, NC under Contract Number NOI-ES-85421

Carcinogenicity

Beryllium and beryllium compounds are known to be human carcinogens, based on findings of increased risk of lung cancer in occupational groups exposed to beryllium or beryllium compounds (Steenland and Ward 1991; Ward et al. 1992) and supporting animal data (IARC 1993; Finch et al. 1996). The epidemiologic evidence supports a conclusion that beryllium and beryllium compounds are carcinogenic to humans. An association with lung cancer has been consistently observed in several populations, with an excess risk of 1.2 to 1.6. Higher risks are found in groups with greater exposure or longer time since first exposure, which are dose-response patterns that support a causal relationship. Acute beryllium pneumonitis, a marker for high exposure to beryllium, is associated with elevated lung cancer rates, with an excess risk of 2.3 (Steenland and Ward 1991). Although smoking is a potential confounder, no evidence was found in any of the published epidemiology studies to indicate that the prevalence of smoking in any of the exposed cohorts was substantially greater than in the referent populations. Animal experiments have shown consistent increases in lung cancers in rats, mice and rabbits chronically exposed to beryllium and beryllium compounds by inhalation or intratracheal instillation. Osteosarcomas have been produced in mice and rabbits exposed to various beryllium salts by intravenous injection or implantation into the bone. Other Relevant Information Beryllium compounds were not mutagenic in a variety of Salmonella tester strains. However, beryllium compounds induced genetic transformations in a variety of mammalian cells, in vitro. The genetic transformation effects of beryllium may be mediated by binding of ionic beryllium to nucleic acids that can produce infidelity in DNA replication.

Identification Of Metabolites

Beryllium metabolites per se have not been identified or studied. Snow (1992), however, reviewed effects of

beryllium and beryllium compounds on cellular immunity and nucleic acid metabolism. This analysis compared beryllium with the carcinogenic metals, nickel and chromium. It was suggested that insoluble beryllium, engulfed by activated phagocytes, can be ionized by myeloperoxidases. Reactive oxygen intermediates formed in this inflammatory reaction to beryllium can bind to nucleic acids and interfere with the fidelity of DNA synthesis (Lansdown 1995, Leonard and Lauwerys 1987).

Uses

Beryllium's earliest application was as a window for X-ray tubes. Because beryllium is relatively transparent to X-rays, these tubes were of the highest standard. Beryllium was then used in aircraft brake manufacturing because of its high specific heat (four times that of steel). Beryllium has a low density yet is very stiff, which results in dimensional stability. Because of these unique properties, it is used in missile, aircraft, and spacecraft guidance systems. Beryllium also is used in test reactors, tokamak reactors, and fusion reactors because it has a combination of high neutron multiplication, low absorption, and high scattering characteristics (Rossman et al. 1991). Around 72% of all beryllium is used to produce beryllium-copper alloys (WHO 1990). While the alloy retains copper's desirable properties (corrosion resistance and thermal and electrical conductivity), addition of beryllium significantly increases the strength of the alloy. Few, if any, other types of copper alloy exhibit as great an increase in strength as beryllium-copper alloy. Because of the strength of this alloy, it can be used in many demanding applications, from military and commercial landing gear to oil field drill collars and drilling bit friction bushings (Rossman et al. 1991). Beryllium-copper alloys do not spark and are nonmagnetic. Non-sparking tools made of beryllium-copper alloy can therefore be used in explosive environments where sparks from steel-to-steel contact must be avoided (IARC 1993).

Soil

Beryllium is the 44th most abundant element in the Earth's crust (IARC 1993). Beryllium concentrations in the Earth's crust are estimated at 2.6 ppm.

Atmosphere

Atmospheric background concentrations of beryllium have been reported to be less than 0.1 and 0.2 ng/m³. Air samples taken over 100 cities in the U.S. from 1964 to 1965 did not contain detectable amounts of beryllium. From 1977 to 1981, average air concentrations of beryllium were around the limit of detection (0.03 ng/m³). From 1981 to 1986, beryllium concentrations at urban monitoring stations exceeded 0.03 ng/m³, ranging from 0.11 to 6.7 ng/m³. Atmospheric concentrations of beryllium are higher around beryllium processing plants than in other areas. The concentration of beryllium in air near a Pennsylvania factory averaged 15.5 ng/m³, with a maximum of 82.7 ng/m³, whereas the background concentrations in several locations in the area averaged only 0.2 ng/m³ (IARC 1993). The average air concentration of beryllium in the United States is 0.03 ng/m³, and the median concentration in cities is 0.2 ng/m³. According to a survey by the National Air Surveillance Network, atmospheric concentrations of beryllium (between 1977 and 1981) were > 0.1 ng/m³ in 50 U.S. cities, with the highest average being 0.4 ng/m³ in Dallas, Texas, in 1979 (ATSDR 1993).

Beryllium concentrations at Ground Zero were 1.8ppm to 4.2 ppm with a mean of 2.96ppm.

External Link:

<http://ntp.niehs.nih.gov/ntp/newhomeroc/roc10/BE.pdf>

Conclusion

Based on a wide variety of evidence much of which is beyond the scope of this report based very simply on sheer size and volume of the available evidence the author of this report is unable to produce all of the evidence necessary to make a fully supported and unequivocal claim that cancers will be forthcoming for the next several generations but this report does indicate, nevertheless, that this is the likely scenario.

Referencing Report, "Report Docket No. NIOSH 227JP," the author is convinced that cases of Leukemia, Myeloma and other rare and not rare cancers will be seen at an increased level not just in First Responders and Rescue Workers and Clean-Up Crew but across the population of people both working and living in the Lower Manhattan area for the next 50+ years.

It is incumbent upon those reading and using these two reports, "Report Docket No. NIOSH 227JP," and, "Report Docket No. NIOSH 227JP2," to respectfully cover all cancers developed by the individuals that unknowingly gave their lives after September 11th, 2001.

End Report