PLYMOUTH, SS

LAND COURT
DEPARTMENT OF
THE TRIAL COURT

CIVIL ACTION NO.
13 MISC 479028-RBF

CHRISTINE A. BOSTEK, et al.,

Plaintiffs

v.

ENTERGY NUCLEAR GENERATION COMPANY, et al.

Defendants

AFFIDAVIT OF DR. RICHARD CLAPP, MPH, DSc IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT ENTERGY'S MOTION TO DISMISS PLAINTIFFS' FIRST AMENDED COMPLAINT FOR LACK OF STANDING

1. My name is Richard W. Clapp. I am Professor Emeritus of Environmental Health at the Boston University School of Public Health and Adjunct Professor at the University of Massachusetts Lowell. I am an epidemiologist with over forty years of experience in public health practice, research, teaching and consulting. I have a Masters in Public Health from Harvard School of Public Health and a DSc in Epidemiology from Boston University School of Public Health. A copy of my curriculum vitae is attached.
2. I was Director of the Massachusetts Cancer Registry and served as its founding director from 1980-1989. The Massachusetts Cancer Registry currently provides

standardized incidence ratios (SIRs) for twenty-three types of cancer in the 351 cities and towns of Massachusetts for a five-year time period. http://www.mass.gov/eohhs/gov/departments/dph/programs/health-stats/cancer-registry/data/

3. My epidemiological research has included studies of cancer around nuclear facilities, in workers and military veterans, and in communities with toxic hazards. I served as a consultant to the U.S. EPA Science Advisory Board in 1995 and 2000.
4. I have performed extensive research on health effects from radiation exposures in people living near the Pilgrim Nuclear Power Station in Plymouth, Massachusetts (Pilgrim).
5. During routine operations, Pilgrim releases radiation into the air, water, and soil in the form of liquid, gaseous and solid radioactive wastes. There have also been accidental releases and leaks of radionuclides into the environment at Pilgrim. The Massachusetts Department of Public Health (MDPH) is overseeing a program of monitoring ongoing leaks of radionuclides from Pilgrim into the soil and groundwater at Pilgrim under its Radiation Conrol Program. http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/radiation/environmental-monitoring.html
6. The radioactivity released by Pilgrim includes many isotopes only produced in nuclear reactors and atomic bombs, including Strontium-89, Strontium-90, Cesium-137, and Iodine-131. These four, and others, are carcinogenic. These radionuclides enter the human body either by inhalation or ingestion, through food. Each radionuclide concentrates in different parts of the human body. For example, iodine

seeks out the thyroid gland, strontium concentrates in the bone and teeth (like calcium), and cesium is distributed throughout the soft tissues. These radionuclides are different from "background" radiation found in nature in cosmic rays and the earth's surface. Background radiation, while still harmful, is not as likely to specifically attack the thyroid gland, bones, or soft tissues.

7. Each of the radionuclides released by Pilgrim decays at varying rates; for example, iodine-131 has a half-life of eight days, and remains in the body only a few weeks. Strontium-90 has a half-life of 28.7 years, and thus remains in bone and teeth for many years.
8. Pilgrim has released radionuclides since 1972 when it began operations. During current and future operations of Pilgrim, under operating conditions allowed by the U.S. Nuclear Regulatory Commission (NRC) in Pilgrim's operating license, Pilgrim will continue to release radionuclides.
9. The NRC requires Entergy to document the types and amounts of radionuclides released from Pilgrim in Annual Environmental Monitoring Program Report. The reports are available each year on NRC's Electronic Library. http://www.nrc.gov/reading-rm.html. Pilgrim's docket number is 05000293.
10. The types of radionuclides Pilgrim releases into the environment are linked to certain types of cancer.
11. Studies and scientific data show increases in radiation-linked diseases in people living and working close to Pilgrim.
12. In the 1980s, the Massachusetts Cancer Registry (Cancer Registry) showed that the incidence of myelogenous leukemia in Plymouth and nearby towns was significantly

higher than the state average rate. Myelogenuos leukemia is a type of cancer that is likely to be triggered by exposure to the type of radiation emitted by Pilgrim.

13. In the 1980s, when I was Director of the Cancer Registry, Dr. Sidney Cobb brought to our attention the pattern of cancer around Plymouth, Massachusetts. As a result of statistical excesses shown by the Cancer Registry in the mid-1980s, MPDH conducted a formal case-control study of adult leukemia in Southeastern. The results of the study were published in a peer-reviewed scientific article in 1996. See, "*Southeastern Massachusetts Health Study, 1978-1986,* Morris M.S., Knorr, R.S. MDPH, Archives of Environmental Health, Vo. 51, p 266, 1996, July-Aug. #4 (Health Study). The Towns most likely to be impacted near Pilgrim are Carver, Duxbury, Kingston, Marshfield, Pembroke, Plymouth and Plympton.
14. The Health Study showed that adults living and working within ten miles of Pilgrim had a fourfold increased risk of contracting leukemia between the years of 1978 and 1983 when compared with people living more than 20 miles away. The report stated, "a dose-response relationship was observed in that the relative risk of leukemia increased as the potential for exposure to plant emissions also increased."
15. After the Health Study, data continued to show an increase in radiation-linked disease near Pilgrim. In a statement before the Southeastern Massachusetts Health Study Review Committee I presented a graphical assessment of the pattern of leukemia and thyroid cancer in the towns closest to Pilgrim during the period 1982-1989.
16. The Cancer Registry shows, for 1998 through 2002, a continuing increase of leukemia and thyroid cancer around Pilgrim. For the years 2002 through 2009 Plymouth had a statistically significant increased level of leukemia, at the 5%

probability level. This means that chance is an unlikely explanation of the difference between the observed and expected cases. There also is a statistically significant increased level of prostate cancer, another radiation linked disease. Prostate cancer and multiple myeloma, both radiation-linked diseases, are also elevated and statistically significant for the years 1998 to 2002. (see also, Cancer Registry pages for Plymouth, 2002-2009)

17. The National Academies of Science (NAS) a private, non-profit society of scholars established by Congress in 1863 charged with providing independent object advice to the nation on matters of science and technology, http://www.nasonline.org/about-nas/mission/ has issued a report on radiation. Its latest report says there is no safe dose of radiation and that exposure to even very low levels of radiation is 3 times more dangerous than previously estimated – especially for children and women. *Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII, Phase 2, June 2005*, Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation, Board on Radiation Effects Research, Division of Earth and Life Sciences, National Research Council of the National Academies, The National Academies Press, Washington, D.C. (BEIR VII) The documented radionuclides released from Pilgrim in the past have long half-lives and bio-accumulate in the environment.

18. The effects of radiation exposure are cumulative. The radionuclides released from Pilgrim include substances that will remain active in the local environment for the foreseeable future and should be taken into account when actual on-going doses to the public and the environment are evaluated.

19. When Pilgrim was initially licensed by the NRC in 1972, the NRC had standards for radiation releases into the environment. When the standards were set by the NRC for permissible releases of off-site radiation, low levels of radiation were considered harmless. However, new data and both epidemiological and experimental research have led the NAS to conclude that no amount of radiation is safe. There is a linear no threshold response to radiation, which means that any increase in exposure confers some increase in cancer risk. Since exposure to low levels of radiation is approximately three-times more dangerous than previously thought, this may explain why radiation-linked disease rates are higher than expected in people living and working near Pilgrim.
20. This new information from NAS about the lack of safe levels of exposure to radiation is particularly relevant to the issue of the continued operation of Pilgrim because the health and environmental effects are cumulative.
21. As the 1990 Southeastern Massachusetts Health Study concluded, the closer one lived to Pilgrim, the greater the risk of cancer. The longer and closer a person has lived to Pilgrim, the greater the risk of exposure to harmful radionuclides and the greater the chance of developing radiation-linked illnesses. For example, a person who lives or has lived within 2 to 10 miles of Pilgrim for a longer period of time has a greater risk of exposure than one who has not lived either as close, or for as long.
22. Continued exposure to radionuclides from Pilgrim's operations will have a greater impact on someone who has been exposed in the past.
23. I understand that the U.S. NRC has relicensed Pilgrim to operate until 2032, and that Entergy is building a dry cask storage facility at Pilgrim for spent nuclear fuel

storage.

24. I understand that the storage of spent nuclear fuel in dry casks emits radionuclides into the environment because the casks have vents that allow air to circulate through to cool the fuel. Small amounts of radionuclides are likely to be emitted.

25. I understand that there is a risk of accidental releases of radionuclides from dry casks that could be at high levels, for example, during a terrorist attack.

26. For as long as Pilgrim continues to operate and release radionuclides into the air and water, it will continue to present a health risk to persons living in proximity to Pilgrim. The closer one lives, the higher the risk. If a person has been exposed to radionuclides in the past, the risk is higher yet.

27. I understand that information about the studies referred to above, and the Cancer Registry data, have often been reported in the media. Based on the studies, the cancer registry data, and media reports about them, a person who lives or has lived close to Pilgrim could reasonably be concerned that he or she has a significant risk of being diagnosed with a radiation-linked cancer.

28. On March 19, 2014, I testified in Plymouth District Court in the trial of several individuals who were being prosecuted for trespassing on Pilgrim property in an effort to raise awareness about the risks of Pilgrim. This trial and a summary of my testimony were published in various media outlets.

Signed under the pains and penalties of perjury this 2nd day of June, 2014.

Dr. Richard Clapp

RICHARD W. CLAPP, D.Sc., MPH
Email: rclapp@bu.edu

EDUCATION

D.Sc.	Boston University School of Public Health, Epidemiology, 1989.
M.P.H.	Harvard School of Public Health, Health Services, 1974.
B.A.	Dartmouth College, Biology, 1967.

EXPERIENCE

2004-present **Senior Environmental Health Scientist, Environmental Health Initiative, Lowell Center for Sustainable Production, School of Health and Environment, University of Massachusetts, Lowell.**
Conducts and supervises epidemiologic data analyses, literature reviews and technical assistance in community-based environmental health studies. Works on other environmental health projects and training activities as required.

2002-2004 **Senior Environmental Health Scientist, Sustainable Communities Group, Tellus Institute.**
Responsible for the development and conduct of studies concerning the health effects of environmental toxic exposures in communities. Provided expert advice and training programs for citizens groups and interested professionals. Assisted in the strategic planning and development of the Environmental Health Program in the Sustainable Communities Group at Tellus.

2010-present **Professor Emeritus, Boston University School of Public Health, Boston, MA**
2002-2010 **Professor, Boston University School of Public Health, Boston, MA**
1995-2002 **Associate Professor, Boston University School of Public Health, Boston, MA.**
1992-1995 **Assistant Professor, Boston University School of Public Health, Boston, MA.**
Teaches courses in environmental health and environmental epidemiology to masters and doctoral level graduate students. Advises doctoral students on dissertations in environmental health and epidemiology. Participated in departmental committees and research activities, including assessment of health effects of nuclear weapons production, environmental and occupational toxic exposures.

1989-1994 **Director, Center for Environmental Health Studies, JSI Research & Training Institute, Boston, MA.**
1995-2002 **Consultant - JSI Research & Training Institute, Boston, MA**
Responsible for development and conduct of studies of health effects of environmental toxic exposures in communities. Coordinated consultants from Boston University School of Public Health Environmental Health Department providing expert advice and training programs for citizens groups and interested professionals. Managed personnel and budget for variety of projects.

1980-1989 **Director, Massachusetts Cancer Registry, Massachusetts Department of Public Health, Boston, MA.**
Responsible for establishing statewide cancer incidence reporting system, coordinating reports from over one hundred fifteen hospitals and licensed clinics, and centralizing

information in computerized database. Supervised staff and consultants involved in data editing, quality assurance and data reporting activities. Worked with broad-based advisory committees, citizens groups, and epidemiologic researchers conducting studies of cancer incidence in Massachusetts. Involved in numerous Department of Public Health committees and research projects, including leukemia in Woburn, and other cities and towns. Participated in regional and national organizations of cancer registry directors.

1979-1980 **Acting Director of Occupational and Environmental Health Studies, Equifax Health Systems Division, Reading, MA.**
Participated in epidemiologic feasibility study of health effects of low-level ionizing radiation, review of OSHA health standards for lead, cotton dust, and asbestos, review of comments on Federal inter-agency carcinogens policy. Supervised staff involved in evaluating union-based occupational health education grant and surveying U.S. population-based cancer registries.

1977-1978 **Director, Childhood Lead Poisoning Prevention, Massachusetts Department of Public Health, Boston, MA.**
Supervised laboratory, office, field inspector and legal staff of statewide program involved in screening for lead poisoning and investigating possible environmental sources of lead. Coordinated development of job training programs for unemployed persons in the areas of lead paint inspections and lead hazard abatement in dwellings. Reported to Governor's Committee on Childhood Lead Poisoning and managed diverse personnel and budgets. Presented educational programs and videotaped training sessions on childhood lead poisoning.

1975-1976 **Executive Director, Lynn Community Health and Counseling Center, Lynn, MA.**
Responsible for overall management of multi-service center offering comprehensive pediatric and adolescent health services, family planning services, childhood lead poisoning prevention services, individual and family counseling, social service advocacy and a day activity program for mentally retarded adults. Worked with other human services agencies in developing a WIC program, and participated in regional and state-level health planning activities. Reported to community board and managed diverse personnel and budgets.

1974-1975 **Manager, Pediatric and Psychiatric Group Practices, Massachusetts General Hospital, Boston, MA**
Managed conversion of out-patient clinics to hospital-based group practices with salaried staff as part of developing Ambulatory Care Center. Implemented cost centers and program planning and budgeting system and reported to Medical Directors of two specialty groups.

1972-1974 **Deputy Director, Prison Health Project, Massachusetts Department of Public Health, Boston, MA.**
Hired medical and ancillary health staff for five state prisons, supervised survey of prison health conditions in county and municipal correctional facilities, and coordinated establishment of two community-based alternative programs for inmates convicted of drug-related crimes. Established twenty-four hour emergency coverage for maximum security prison, and worked with inmate medical advisory committees at several facilities.

1970-1972 **Program Research Analyst, New York City Health Services Administration, New York, NY**
Analyzed public health programs in City Hospitals, the prison hospital and Houses of Correction. Made recommendations regarding improved operations and staffing levels. Drafted guidelines for affiliation agreement for teaching hospital administration of Riker's Island prison medical services.

TEACHING APPOINTMENTS

2010-present Professor Emeritus, Boston University School of Public Health.
2004-Present Adjunct Professor, University of Massachusetts –Lowell.
2002-2010 Professor, Boston University School of Public Health.
1995-2002 Associate Professor, Boston University School of Public Health.
1993-1995 Assistant Professor, Boston University School of Public Health.
1990-1993 Adjunct Assistant Professor, Boston University School of Public Health.
1989-1995 Assistant Clinical Professor, Tufts University School of Medicine

PUBLICATIONS

Lurker PA, Berman F, Clapp RW, Stellman JM. Post-Vietnam military herbicide exposures in UC-123 Agent Orange spray aircraft. Env Res 130:34-42, 2014.

Geller AC, Clapp RW, Sober AJ, Gonsalves L, Mueller L, Christiansen C, et al. Melanoma epidemic: An analysis of six decades of data from the Connecticut Tumor Registry. J Clin Oncol 31 (doi/10.1200/JCO.2012.47.3728), 2013.

Jacobs MM, Massey RI, Clapp RW. The burden of cancer from organic chemicals. In Effects of Persistent and Bioaccumulative Organic Pollutants on Human Health. Carpenter DO, ed. (John Wiley & Sons: Hoboken, NJ), 2013.

Roelofs CR, Kernan GJ, Davis LK, Clapp RW, Hunt PR. Mesothelioma and employment in Massachusetts: Analysis of cancer registry data 1988-2003. Am J Ind Med, published on-line June, 2013.

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Epstein PR, Buonocore J, Eckerle K, Hendryx M, Stout B, Heinberg R, Clapp R, et al. Full cost accounting for the life cycle of coal. Ann NY Acad Sci 1219(1):73-98, 2011.

Clapp R. Chemicals Policy in the 2008-2009 President's Cancer Panel Report. New Solutions 21(3):447-455, 2011.

Clapp R. Industrial Carcinogens: A Need for Action. Rev Environ Health 24 (4):257-262, 2009.

Clapp R. The Love Canal story is not finished. Environ Health Perspect 117:A54, 2009.

Clapp RW, Hoffman K. Cancer mortality in IBM Endicott plant workers, 1969-2001: an update on a New York production plant. Environmental Health 7:13, 2008.

Clapp R, Jacobs M, Loechler E. Environmental and occupational causes of cancer: New evidence 2005-2007. Rev Environ Health 23:1-37, 2008.

Clapp R. Polychlorinated biphenyls. In: Last's Public Health and Preventive Medicine, 15th ed. (McGraw-Hill: New York), 2008.

Clapp R and Kakos W. Nuclear energy use. In Heggenhougen and Quah: International Encyclopedia of Public Health (2008), Academic Press, San Diego.

Clapp RW, Howe G, Jacobs M. Occupational and Environmental Causes of Cancer. In Heggenhougen and Quah: International Encyclopedia of Public Health (2008), Academic Press, San Diego.

Belpomme D, Irigaray P, Newby JA, Howard V, Clapp R, Sasco AJ, Hardell L. The growing incidence of cancer: Role of lifestyle and screening detection (Review). Int J Oncology 31:1037-1049, 2007.

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Irigaray P, Newby JA, Clapp R, Howard V, Montagnier L, Epstein S, Belpomme D. Lifestyle-related factors and environmental agents causing cancer: an overview. Biomed Pharmacotherapy 61:640-658, 2007.

Belpomme D, Irigaray P, Hardell L, Clapp R, Montagnier, Epstein S, Sasco AJ. The multitude and diversity of environmental carcinogens. (Review) Environ Res 105:414:429, 2007.

Clapp R. Mortality among US employees of a large computer manufacturing company: 1969–2001. Environmental Health: A Global Access Science Source 5:30, 2006.

Silver K and Clapp R. Environmental Surveillance at Los Alamos: An independent assessment of historical data. Risk Analysis 26(4):893-906, 2006.

Clapp R, Hoppin P, Kriebel D. Erosion of the integrity of public health science in the USA. Occ Env Med 63:367-8, 2006.

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Hoppin P and Clapp R. Science and Regulation: Current Impasse and Future Solutions. Am J Public Health 95;S1:S8-S12, 2005.

Clapp RW. Chapters on Lymphoma, Multiple Myeloma and Soft Tissue Sarcoma, in Preventing Occupational Disease, second edition. Levy BS, et al., eds. APHA Publications, 2005.

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Clapp R. Popular Epidemiology in Three Contaminated Communities. Ann Am Acad Polit and Soc Science. 584:35-46, November, 2002.

Clapp R, Proctor SP, MacMillan A. Cancer Incidence in Massachusetts Persian Gulf War Veterans. Epidemiology 13(abstract #352), July, 2002.

Clapp R, Rougvie C, Gray T, Phillips R, Greene T, Kohn R. Community-driven Epidemiology in a PCB-contaminated Community. Epidemiology 12(abstract #288), July, 2001.

Brown P and Clapp RW. Looking Back on Love Canal. Public Health Reports 117(2):95-98, 2002.

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Clapp RW and Ozonoff DM. Where the Boys Aren't: Dioxin and the Sex Ratio. Lancet 355:1838-9, 2000.

Clapp RW. Environment and Health: 4. Cancer. Can Med Assoc J 163(8):1009-12, 2000.

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Ozonoff DM and Clapp RW. Cancer Survival is No Lottery. Lancet 353:1379-80, 1999.

Fikfak M, Clapp RW, Kriebel D. Health Risks of Decommissioning Nuclear Facilities. New Solutions 9(2):153- 161, 1999.

Clapp RW and Coogan PF. Leukemia in Petroleum Refinery Workers: A Review of Recent Studies. New Solutions 9(4):375-387, 1999.

Colton T and Clapp RW. Proportional Mortality Studies. In Encyclopedia of Biostatistics, Armitage P and Colton T, eds. Volume 5, pp. 3556-8. John Wiley and Sons, London, 1998.

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Hesketh PJ, Clapp RW, Doos WG, Spechler SJ. "Increasing Frequency of Adenocarcinoma of the Esophagus," Cancer 64:526-530, 1989.

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Kogan MD, Clapp RW. "Soft Tissue Sarcoma Mortality Among Vietnam Veterans in Massachusetts, 1972 to 1983." Int J Epidemiol 17: 39-43, 1988.

Finison L, Jaques P, Spaight S, Fine W, Clapp RW, O'Sullivan V. "Data Bases for Patterns of Care Studies in Defined Populations." Prog Clin Biol Res 130:465-476, 1983.

Dreyer NA, Loughlin JE, Friedlander ER, Clapp RW, Fahey FH. "Choosing Populations to Study the Health Effects of Low-Dose Ionizing Radiation," Am J Pub Hlth 71: 1247-1252, 1981.

Clapp, RW. "The Massachusetts Childhood Lead Poisoning Prevention Program," in Low Level Lead Exposure: The Clinical Implications of Current Research, Needleman HL, ed., Raven Press, NY, NY, 1980.

PRESENTATIONS

"Update of Agent Orange/dioxin and Human Health." American Public Health Association Annual Meeting, Boston, MA, 2013.

"Epidemiologic results of US semiconductor and computer manufacturing worker studies." American Public Health Association Annual Meeting, San Francisco, CA, 2012

"Scientific Inference and Public Policy." International Society for Environmental Epidemiology Annual Meeting, Barcelona, Spain, 2011

"From Science to Policy: Addressing health impacts of institutional and large-scale woody biomass burning." International Society for Environmental Epidemiology Annual Meeting, Barcelona, Spain, 2011

"Epidemiologic studies generated during litigation: Lessons from three plaintiff-supported studies." International Society for Environmental Epidemiology Annual Meeting, Pasadena, 2008

"Trends in melanoma incidence and mortality." International Society for Environmental Epidemiology Annual Meeting, Mexico City, Mexico, 2007

"Mortality in a large computer manufacturing company, 1969-2001." American Public Health Association Annual Meeting, Boston, 2006.

"Recent Epidemiologic Evidence of the Carcinogenicity of Dioxin." American Public Health Association Annual Meeting, Philadelphia, PA, 2005.

"Pesticides and Child Development in Rural KwaZulu-Natal. International Society for Environmental Epidemiology, Johannesburg, SA, 2005.

"Uses and Mis-uses of Epidemiology in Torts." International Society for Environmental Epidemiology Annual Meeting, NY, NY, 2004.

"PCBs, Dioxins and Cancer – an Update." Cancer Prevention Rounds. Boston University School of Medicine, Boston, MA, 2003

"Health Impacts of the Nuclear Fuel Cycle." Epidemiological Society of Southern Africa Annual Meeting, East London, South Africa, 2000.

"Childhood Leukemia in Woburn, MA: Science, Politics and Policy." International Society for Environmental Epidemiology Annual Meeting, Athens, Greece, 1999.

"Incidence of Malignancy in Populations Adjacent to the Pilgrim Nuclear Reactor." Symposium on Recent Studies of Low-Level Radiation and Implications for Medicine and the Nuclear Industry, New York City, 1998.

"Cancer Surveillance of Massachusetts Veterans, 1988-1993". North American Association of Central Cancer Registries Annual Conference, Boston, MA, 1997.

"Update of Cancer Incidence in Massachusetts Veterans, 1988-1993." International Society of Epidemiology in Occupational Health Annual Meeting, Harare, Zimbabwe, 1997.

"The Upper Cape Cancer Incidence Study". Sixth Annual Symposium on Environmental and Occupational Health during Societal Transition in Central and Eastern Europe, Eforie Nord, Romania, June, 1995.

"Popular Epidemiology." Loka Institute Conference on Dissenting Ways of Knowing, University of Massachusetts, Amherst, MA, 1994.

"Agency Responses to the Woburn Leukemia Cluster". Fifth Annual Symposium on Environmental and Occupational Health during Societal Transition in Central and Eastern Europe, Nitra, Slovak Republic, 1994.

"New Carcinogen Threshold Theories: Implications for Prevention," University of Connecticut conference on Incorporating Molecular Mechanisms into Estimates of Cancer Risk, 1992.

"Angiosarcoma, porphyria cutanea tarda and probable chloracne in a worker exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin-contaminated waste oil," Twelfth International Symposium on Dioxins and Related Compounds, Tampere, Finland, 1992.

"Occupation and Race Data in Central Cancer Registries," American Public Health Association Annual Meeting, Atlanta, 1991.

"Respiratory Cancer by Race and Gender: Selected Occupational Associations in Massachusetts, 1982-85," National Minority Health Conference, Atlanta, 1990.

"Statistical Methods for Analyzing Cancer Clusters." National Conference on Clustering of Health Events, Atlanta, GA, 1989.

"Cancer Statistics and the Right to Know". American Public Health Association Annual Meeting, Boston, 1988.

"Respiratory Disease Mortality and Morbidity, Respiratory Cancer and Mesothelioma Incidence: Occupational Associations in Massachusetts, 1982-1985." American Public Health Association Annual Meeting, Boston, 1988.

"Soft Tissue Sarcoma Incidence in Massachusetts Vietnam Veterans, 1982-1986." American Public Health Association Annual Meeting, Boston, 1988.

"Dealing with Cancer Clusters." American Association of Central Cancer Registries founding meeting, Chicago, IL, 1988.

"Cancer Surveillance in Massachusetts, 1982-1983." International Association of Cancer Registries Meeting, Hartford, CT, 1985.

OTHER INVITED PAPERS

“Contested territory: Research on workers’ health.” American Public Health Association Annual Meeting, San Francisco, CA, 2012

“Avoidable Occupational and Environmental Causes of Cancer.” President’s Cancer Panel meeting, East Brunswick, NJ, 2008

“Avoidable Occupational and Environmental Causes of Cancer.” Occupational and Environmental Cancer Prevention conference, Stirling, Scotland, 2008.

“Health Effects of the Nuclear Fuel Cycle.” Northeast Student Pugwash conference. Cambridge, MA, 2008.

“Occupational and Environmental Causes of Cancer.” Second International Congress of the Paris Appeal, Paris, France, 2006.

“Occupational and Environmental Causes of Cancer.” Collaborative on Health and Environment Annual Meeting, San Francisco, CA, 2006.

“Industry Influence in the EPA Dioxin Reassessment.” Center for Science in the Public Interest, Washington, DC, 2004.

“The U.S. War on Cancer.” Cancer, Environment and Society conference, ARTAC/UNESCO, Paris, France, 2004.

"Epidemiology in Toxic Torts." Environmental and Occupational Health Sciences Institute, Robert Wood Johnson Medical School, Piscataway, NJ, October, 2000.

"Global Climate Change and Health." Grand Rounds, Dartmouth Medical School, Lebanon, NH, December, 1999.

"PCBs in Massachusetts: Is There a Cancer Risk?" Cancer Prevention Rounds, Boston University School of Public Health, January, 1998.

"Epidemiologic Studies of the Woburn Childhood Leukemia Cluster." American College of Occupational and Environmental Medicine Annual Meeting, April, 1998.

"Agent Orange and Veterans Health - 1996 Update." Occupational Health Program, Harvard School of Public Health, Boston, March, 1997.

"Surveillance of Cancer in Massachusetts Veterans, 1988-1993." Tumor Registrars Association of New England, St. Elizabeth's Hospital, May, 1997.

"Health Effects of U.S. Nuclear Weapons Production". Slone Epidemiology Unit, Brookline, MA, June, 1997.

"Agent Orange and Veterans Health - 1996 Update." Public Health Forum, Boston University School of Public Health, Boston, November, 1996.

"Agent Orange and Cancer". Cancer Prevention Rounds. Boston University Medical Center, Boston, MA, 1994.

"Patterns of Cancer in Vietnam Veterans". Hematology/Oncology Rounds. Massachusetts General Hospital, Boston, MA, 1991.

"Agent Orange, Health Effects and Government Policy". Health and the Environment Lectureship. Brown University, Providence, RI, 1991.

"Cancer Surveillance of Vietnam Veterans in Massachusetts". Distinguished Lecture Series in Occupational Medicine. Robert Wood Johnson Medical School, Piscataway, NJ, 1989.

HONORS AND AWARDS

Scientific Research Award, Occupational Health and Safety Section, APHA, 2012
Helen Clark Award, Silicon Valley Toxics Coalition, 2008
Research Integrity Award. International Society for Environmental Epidemiology, 2008
Science for the Benefit of Environmental Health. B.U. Superfund Basic Research Program, 2006
Member, Harvard School of Public Health Occupational Health Program Advisory Committee, 2000-2009
Vice-Chair, Greater Boston Physicians for Social Responsibility Steering Committee, 1999-2008
Chair, Massachusetts Toxics Use Reduction Institute Science Advisory Board, 1994-1996; Member, 1994-2003
Marla Frazin Award, Massachusetts Breast Cancer Coalition, 2002
Public Scientist of the Year Award, Association for Science in the Public Interest, 2001
Member, International Society for Environmental Epidemiology Governing Council, 2001

Member, Harvard School of Public Health Alumni Council, 1997-1999
Award for Public Health in the Work Environment, University of Massachusetts Lowell, 1997
Member of Massachusetts Advisory Board on Toxics Use Reduction, 1990-1994
Lemuel Shattuck Award, Massachusetts Public Health Association, 1990
Environmental Health Network 1990 National Award

PROFESSIONAL MEMBERSHIPS

- American Public Health Association
- MassCOSH
- Massachusetts Public Health Association
- Society for Epidemiologic Research
- International Society for Environmental Epidemiology