



cc. D. Penner

VRD 00002030008

September 22, 1993

Tom Grumbles, Manager
Safety Health and Environment
Vista Chemical
900 Threadneedle
Houston, TX 77079-2990

Dear Tom:

Enclosed is a description of Applied Epidemiology, Inc. I look forward to assisting you with whatever epidemiological support you may need. Please do not hesitate to call if you would like additional information.

Thank you for your interest in Applied Epidemiology, Inc.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Ken", written over a horizontal line.

Kenneth A. Mundt, Ph.D.

enclosure



Applied Epidemiology, Inc.

DESCRIPTION

BACKGROUND

Applied Epidemiology, Inc. is a full-service epidemiological consulting firm specializing in occupational and environmental health, as well as biostatistical, methodological and interpretational issues. We have extensive experience ranging from formal epidemiological studies, to critical reviews and interpretations of the human health and medical literature, to educational and instructional programs.

Founded in 1989 and incorporated in 1991, **Applied Epidemiology, Inc.** has provided consulting services to a variety of North American and European clients including government agencies, non-profit organizations, industry trade groups, as well as private corporations. This heterogeneity of clientele is indicative of our strong philosophical commitment to scientific objectivity, as well as our general goal of providing practical solutions derived from an epidemiological perspective.

We at **Applied Epidemiology, Inc.** invite you to discuss with us your occupational and environmental health interests, or research or instructional needs.

Mailing address:

P.O. Box 2424
Amherst, MA 01004

Office address:

South Towne Commons
479 West Street, Suite 90
Amherst, MA 01002

(413) 256-3556 (Telephone)
(413) 256-3503 (FAX)

PEOPLE

Applied Epidemiology, Inc. enjoys and benefits from the participation of a variety of professionals as staff and associates. The following individuals are available on a regular basis to address most project needs:

Kenneth A. Mundt, Ph.D., is President and Senior Epidemiologist of the Company. He received an M.S. in Epidemiology from the University of Massachusetts and a Ph.D. in Epidemiology from the University of North Carolina at Chapel Hill. Dr. Mundt holds university appointments in the Department of Biostatistics and Epidemiology at the University of Massachusetts; Akademie für Öffentliche Gesundheit at the Ruhr Universität in Bochum, Germany; and the Institut für Epidemiologie und Sozialmedizin at the Westfälische Wilhelms Universität in Münster, Germany.

Linda D. Dell, M.S., is Project Manager and Epidemiologist. She received her M.S. in Epidemiology from the University of Massachusetts, and has experience in industrial epidemiology from her work in the corporate epidemiology department of a major chemical company. Ms. Dell also has interest and experience in environmental epidemiology as well as reproductive epidemiology.

Carol Bigelow, Ph.D., serves as Biostatistician for the Company. Dr. Bigelow received both an M.S. and Ph.D. in Biostatistics from the University of Washington at Seattle, and holds a faculty appointment in the School of Public Health of the University of Massachusetts. Dr. Bigelow is expert in multivariate analytical techniques, and teaches biostatistics and computer analysis in our "Intensive Course in Occupational Epidemiology" (ICOE).

Rainer Noess is an information management specialist, and provides hardware and software developmental support for the Company. Mr. Noess has extensive experience in managing data from large epidemiological studies, as well as Health and Safety and Occupational Surveillance databases.

Elizabeth Mundt is office manager of the Company, and provides support services in data entry, word processing, accounting, and library search and retrieval.

PEOPLE (continued)

Associates of Applied Epidemiology, Inc. provide expertise and a broader perspective to certain projects and activities, as well as facilitate our ability to meet the needs of clients in Europe or other locations.

Joseph P. Tritzschler, Ph.D., is an agricultural environmental expert with particular interest in applying epidemiological methods to the study of environmental determinants of animal and human health, especially nutrition and parasites. Dr. Tritzschler received his Ph.D. from the University of Florida at Gainesville, and holds a faculty appointment at the University of Hawaii at Hilo, where he also serves as Extension Service and Research Station Director.

Walter Dieckmann, Dipl. rer. Soc., is Manager of the ICOE, and other European projects. Mr. Dieckmann is a medical sociologist by training, and holds an academic appointment at the Ruhr Universität in Bochum, Germany.

Two epidemiologists of international recognition serve as external advisors to the Company:

Carl M. Shy, M.D., Dr.P.H., Professor and Chair, Department of Epidemiology, University of North Carolina at Chapel Hill

Harvey Checkoway, Ph.D., Professor of Epidemiology, Department of Environmental Health, University of Washington at Seattle. Dr Checkoway also serves as an instructor in the ICOE.

In addition, **Applied Epidemiology, Inc.** maintains an extensive network of experts and support staff available on a project-specific basis, or as needed, representing the following areas:

Occupational Medicine

Toxicology and Risk Assessment

Industrial Hygiene and Environmental Monitoring

Workplace Health Education and Health Promotion

EXAMPLES OF RECENT PROJECTS

Research

- Developing an epidemiological occupational surveillance system and survey to determine the health status of employees at a chemical plant;
- Preparing a research plan for an organization interested in identifying workplace stress and evaluating preventive measures and interventions, including study design, analysis and interpretation;
- Analyzing data on toxic metal exposure and reproductive outcome to determine shape of risk curve;
- Advising company on epidemiological approach to determine possible health effects of an accidental chemical release to the community;
- Comprehensively reviewing and critiquing health literature on human health effects of low-level exposure to mercury.

Short Courses

- Intensive Course in Occupational Epidemiology (ICOE), held May 25-30, 1993 and to be held again June 5-10, 1994 in Wermelskirchen, Germany. ICOE will be held in Kiev, Ukraine in 1995;
- Occupational and Environmental Epidemiology, held August 12-16, 1991 at the Cancer Registry of Norway, Oslo, Norway.
- Establishing an Occupational Epidemiology Program, held March 12, 1991 for the Chemical Manufacturer's Association, Washington, D.C.

RESOURCES

Applied Epidemiology, Inc. utilizes both Macintosh and IBM-compatible computers. We maintain an extensive library of textbooks and references on epidemiology, toxicology, medicine, environmental health, biostatistics, etc. A partial listing of our journal subscriptions includes

- American Journal of Epidemiology
- American Journal of Industrial Health
- American Journal of Public Health
- American Scientist
- Applied Occupational and Environmental Hygiene
- Archives of Environmental Health
- British Journal of Industrial Medicine
- Epidemiology
- Occupational Health and Safety
- Occupational Medicine: State of the Art Reviews
- Scandinavian Journal of Work Environment and Health
- Science News

Additionally, we receive numerous newsletters, government publications, mailings and catalogues on relevant topics.

Because **Applied Epidemiology, Inc.** is located in central Massachusetts, we have direct access to several local libraries including the University of Massachusetts, Smith College, Hampshire College, Mount Holyoke College and Amherst College. All relevant databases and search services are available in addition to their collective holdings. Specialized collections at the University of Massachusetts Medical School Library and the Countway Library at Harvard University Medical School are located nearby.

LIST OF RECENT CLIENTS

Allied-Signal, Inc., Morristown, New Jersey
 Akademie für öffentliche Gesundheit , Bochum, Germany
 American Chrome & Chemicals, Corpus Christi, Texas
 Association of Schools of Public Health, Washington, D.C.
 BASF AG, Ludwigshafen, Germany
 Bayer AG, Leverkusen, Germany
 The Cancer Registry of Norway, Oslo
 Chemical Manufacturers of America, Washington, D.C.
 The Chlorine Institute, Washington, D.C.
 E. I. Du Pont de Nemours, Wilmington, Delaware
 Epach, Inc., Amherst, Massachusetts
 GeoTrans, Inc., Sterling, Virginia
 The Global Center for Occupational and Environmental
 Health Studies, Inc., Albany, New York
 Health Protection Branch, Health and Welfare, Canada
 Hoechst AG, Frankfurt, Germany
 International Chrome Development Association, Paris
 Industrial Health Foundation, Pittsburgh
 (continued)

LIST OF RECENT CLIENTS (continued)

New York State Department of Health, Albany, New York

Occidental Chemical Corporation, Dallas

Occusafe, Inc., Chicago, Illinois

Ruhr-Universität, Bochum, Germany

State of Colorado (Office of the Attorney General), Denver

UOP, Chicago, Illinois

The World Bank, Washington, D.C.

Curriculum Vitae

KENNETH ARTHUR MUNDT, Ph.D.

CURRENT POSITIONS

Assistant Professor (1989-present)

Department of Biostatistics and Epidemiology
School of Public Health
403 Arnold House
University of Massachusetts
Amherst, MA 01003

Telephone (413) 545-2861
Fax (413) 545-1645

Visiting Assistant Professor (1991-1996)

Abteilung für Sozialmedizin und Epidemiologie
Ruhr-Universität Bochum
Postfach 10 21 48
D-4630 Bochum 1
Germany

Senior Epidemiologist (1989-present)

Applied Epidemiology, Inc.
P.O. Box 2424
Amherst, MA 01004

Telephone (413) 256-3556
Fax (413) 256-3503

EDUCATION

Ph.D., Epidemiology

University of North Carolina at Chapel Hill,
Chapel Hill, North Carolina, 1990.

M.S., Epidemiology

University of Massachusetts at Amherst,
Amherst, Massachusetts, 1986.

M.A., English

University of Virginia at Charlottesville,
Charlottesville, Virginia, 1982.

A.B., English

Dartmouth College,
Hanover, New Hampshire, 1981.

UNIVERSITY RESEARCH

1993

Principal Investigator
Healy Endowment Award. Lead Prevalence Study
(1993-4) \$5,000

Principal Investigator/Convenor.
Second National Conference on Occupational Surveillance,
University of Massachusetts, Amherst, MA.
(March 9-11, 1993) \$26,000

Sponsors: E.I. Du Pont de Nemours
Monsanto
Eastman Kodak
Unocal
Dow Chemical

1992

Principal Investigator.
E.I. Du Pont de Nemours Company. Educational Aid
Program. Occupational Epidemiology Unit.
(1992-4) \$15,000/year

Co-Investigator.
Chemical Manufacturers of America. Definition and
Strategies for Developing Occupational Surveillance.
(1992-3) \$38,000

Principal Investigator.
Faculty Research Grant. Epidemiological Surveillance.
(1992-3) \$4,940

Principal Investigator.
Faculty Research Grant for Conference/Performance Travel.
Third Annual Symposium on Environmental and
Occupational Health in Central & Eastern Europe in Poland.
(1992) \$600

Investigator.
Occidental Chemical Corporation. Development of a
Corporate Epidemiological Surveillance System.
(1991-2) \$50,000/year

1991

Principal Investigator/Convenor.
National conference, "Occupational Surveillance"
University of Massachusetts, Amherst, MA.
(April 28-30, 1991) \$22,000

Sponsors: Occidental Chemical
E.I. Du Pont de Nemours
Exxon
Monsanto
Eastman Kodak
General Electric
American Industrial Health Council

UNIVERSITY RESEARCH (continued)

- 1990 Investigator.
Chemical Manufacturers of America. Development of
Resource Materials for Occupational Epidemiology.
(1990) \$75,000
- Principal Investigator.
National Institute of Occupational Safety and Health.
Immuno-Epidemiology of Crab-Induced Occupational
Asthma.
(1989-1990) \$43,500.
- 1989 Principal Investigator.
United Way of North Carolina.
Immuno-Epidemiology of Crab-Induced Occupational
Asthma: Pilot and Preparatory Phases.
(1989) \$4,000.
- Principal Investigator.
Biomedical Research Support Grant,
School of Public Health, University of North Carolina.
Production of Antigen Solutions for Skin Testing.
(1988-1989) \$5,886.

RELEVANT EXPERIENCE

- 1993 - 1994 Guest Editor, Journal of Ambulatory Care Management
(April, 1994 issue on Occupational Health).
- 1993 - present Director, Occupational Epidemiology Unit
School of Public Health, University of Massachusetts.
- 1993 Member, 1993 Internship Program Objective Review
Committee, Association of Schools of Public Health/Centers
for Disease Control/Agency for Toxic Substances Disease
Registry.
- 1992 - present Founder and Director, Surveillance Resource Center,
Occupational Epidemiology Unit.
- 1992 - present Epidemiologist, Northeast Regional Environmental Public
Health Center, School of Public Health, University of
Massachusetts.
- 1992 - present Member, Human Subjects Committee, School of Public
Health, University of Massachusetts.
- 1991 - present Member, Union Carbide Scientific Board of Advisors.
- 1990 - present Member, International Chrome Development Association,
Health, Safety and Environment Committee, Paris, France.

RELEVANT EXPERIENCE (continued)

- 1990 - present Epidemiologist, Chromium Environment, Health and Safety Committee, Industrial Health Foundation, Pittsburgh, PA.
- 1989 - 1993 Founder and CO-Director, Occupational Epidemiology Unit, School of Public Health, University of Massachusetts.
- 1988 - 1989 Research Assistant to Carl M. Shy, M.D., Dr.P.H., on Oak Ridge Universities Occupational Studies of Department of Energy Employees, and on North Carolina Dusty Trades Occupational Health Studies, University of North Carolina.
- 1988 - 1989 Visiting Researcher, Duke University Marine Biomedical Center, Duke Marine Laboratory, Pivers Island, Beaufort, North Carolina.
- 1983 - 1984 Commissioned Officer Student Training Extern Program (COSTEP). United States Public Health Service, Health Resources and Services Administration, Silver Spring, Maryland.

TEACHING EXPERIENCE

- 1989 - present Assistant Professor
University of Massachusetts, School of Public Health:
 - "Principles of Epidemiology"
 - "Applied Epidemiology"
 - "Occupational Epidemiology"
 - "Special Topics in Occupational Epidemiology"
 - "Departmental Doctoral Seminar"
 - Numerous Independent Study Projects
- 1987 - 1988 Teaching Assistant to David G. Kleinbaum, Ph.D.
University of North Carolina, School of Public Health.
 - "Special Topics in Epidemiological Methods"
 - "Advanced Methods in Epidemiology"

SHORT COURSES

- 1993 Applied Epidemiology, Inc. and Akademie für öffentliche Gesundheit, Wermelskirchen, Germany. May 23-28:
 - "Intensive Course in Occupational Epidemiology"

SHORT COURSES (continued)

- 1991 Cancer Registry of Norway, Oslo, Norway. August 12-16:
 "Occupational and Environmental Epidemiology"
- 1989, 1990, 1991 International Summer School for Epidemiology, World
 Health Organization and the Akademie für öffentliche
 Gesundheit , Bochum, Germany
 "Occupational and Environmental Epidemiology"

HONORARY AND PROFESSIONAL SOCIETIES

- American Conference of Governmental Industrial Hygienists (Full Member)
- American Public Health Association
- Delta Omega, Public Health National Honor Society
- International Society for Environmental Epidemiology
- Massachusetts Public Health Association
- Sigma Xi, Scientific Research National Honor Society
- Society for Epidemiologic Research

PRESENTATIONS

1993

- Mundt K.A. "Occupational Epidemiology in a White-Collar Setting." Invited
Speaker, The World Bank, May 11-12, 1993.
- Mundt KA. "Occupational Surveillance: Concepts and Goals." Second National
Conference on Occupational Surveillance, University of Massachusetts,
Amherst, MA, March 9-11, 1993.
- Mundt KA. "Practical Strategy for Developing Epidemiological Surveillance."
Design and Analysis Workshop, Second National Conference on Occupational
Surveillance, University of Massachusetts, Amherst, MA, March 9-11, 1993.

1992

- Mundt KA and Weiland S. "The Association of Asthma Symptoms and Allergic
Rhinitis with Traffic Density on Street of Residence." Annual meeting of the
International Societies for Environmental Epidemiology and of Exposure
Analysis, Cuernavaca, Morelos, Mexico, August 26-29, 1992.

PRESENTATIONS (continued)

Pastides H and Mundt KA. "Retrospective Estimation of Exposure to Hexavalent Chromium in an Occupational Cohort ." Annual meeting of the International Societies for Environmental Epidemiology and of Exposure Analysis, Cuernavaca, Morelos, Mexico, August 26-29, 1992.

Pastides H and Mundt KA. "Epidemiological Occupational Surveillance." Surveillance in Europe and the EEC, Devonshire Park Centre, Eastbourne, Sussex, United Kingdom, July 1-3, 1992.

Mundt KA. "Occupational Surveillance as a Strategy for Policy Development and Disease Prevention." Protecting Workers, the Environment and Health in a Market Economy: Translating Science into Policy and Action. The United States-Central and Eastern Europe Exchange for Occupational and Environmental Health, third annual symposium, Pultusk, Poland, June 26 - July 1, 1992.

Pastides H, Austin R, Lemeshow S, Klar J, Noess R, and Mundt KA. "A Retrospective Cohort Study of Health Risks Among Chromate Production Workers." Annual Meeting of the Society for Epidemiologic Research, Minneapolis, MN, June 10-12, 1992.

Weissman L and Mundt KA. "Prevalence of Immediate Hypersensitivity in Black Women: A Re-evaluation of Skin Prick Test Data from the Second National Health and Nutrition Examination Survey (NHANES II) and Comparison with an Occupational Study." Annual Meeting of the Society for Epidemiologic Research, Minneapolis, MN, June 10-12, 1992.

Mundt KA, Leeser J, Adams R. "Establishing a Mercury Biological Exposure Index (BEI)." American Conference of Governmental Industrial Hygienists (ACGIH) BEI and Threshold limit value (TLV) Committees, Orlando, Fla., March 21-22, 1992.

1991

Mundt KA. "Epidemiological Approach to Occupational Health." Annual Scientific Meeting, Industrial Health Foundation, Pittsburgh, PA, November 6-7, 1991.

Mundt KA. "Role of Epidemiology in an Occupational Medical Department." Bayer Chemical, Leverkusen, Germany, June 19, 1991.

Mundt KA. "Occupational Epidemiological Studies and the Social Context." Department of Epidemiology, State University of New York at Albany, April 18, 1991.

Mundt KA. "Use of Skin Tests in Epidemiological Research." Clinical Epidemiology Department, University of Pennsylvania, Philadelphia, PA, March 14, 1991.

Pastides H and Mundt KA. "Establishing an Occupational Epidemiology Program." Chemical Manufacturers Association, Washington, D.C., March 12, 1991.

PRESENTATIONS (continued)

1990

Mundt KA. "Studies to Document the Healthy Worker Effect." Department of Work Environment, University of Lowell, Lowell, MA, December 11, 1990.

Mundt KA and Miller J. "Use of Industrial Hygiene Data in Epidemiology Research." Occidental Chemical Industrial Hygiene Annual Meetings, Houston TX and Atlantic City, NJ, November 12-14, 1990.

Mundt KA and Shy C. "Occupational Allergies and the Healthy Worker Effect." Annual Meeting of the Society for Epidemiologic Research, Snowbird, Utah, June 12-15, 1990.

Mundt KA. "Health Effects of Vinyl Chloride Monomer (VCM)." Occidental Chemical Company, Plastics and Polymers Group, Berwyn, PA, May 11, 1990.

1989

Mundt KA. "Skin Testing for Allergies in an Occupational Setting." Clinical Epidemiology Seminar Series, University of Massachusetts Medical Center, Worcester, MA, December 20, 1989.

Mundt KA. "Immuno-Epidemiology of Crab-Induced Occupational Asthma: Methodological Issues." Visiting Researcher Program, Duke University Marine Biomedical Center, Beaufort, North Carolina, January, 12-13, 1989.

1987

Mundt KA and Heiss G. "Measuring Ankle Systolic Blood Pressure: Interaction Between Ankle Geometry and Method of Applying Blood Pressure Cuff." National Heart, Lung and Blood Institute Seminar, Bethesda, Maryland, November 3, 1987.

Mundt KA and Pastides H. "Microcomputer-Based Instruction: Applications in Epidemiology." Annual Meeting of the American Public Health Association, New Orleans, Louisiana, October 18-22, 1987.

1986

Mundt KA. "Distribution of Selected Mineral Concentrations in Urban Children's Hair." Annual Meeting of the American Public Health Association, Las Vegas, Nevada, September 28 - October 2, 1986.

PUBLICATIONS AND REPORTS

1993

Weiland SK, Mundt KA, Rückmann A and Keil U. Self-reported wheezing and allergic rhinitis in children and traffic density on street of residence (accepted for publication) *Annals of Epidemiology*.

Pastides H and Mundt KA. Establishing an Epidemiological Occupational Surveillance Program. Chemical Manufacturers of America, Washington, D.C., 1993.

Pastides H, Austin R, Lemeshow S, Klar J, Noess R and Mundt, K. Retrospective estimation of exposure to hexavalent chromium in an occupational cohort (accepted for publication) *American Journal of Industrial Medicine*.

1992

Pastides H, Austin R, Lemeshow S, Klar J, Noess R and Mundt, K. Occupational cohort study of chrome chemical manufacturers (submitted for publication).

Mundt KA. Occupational surveillance as a strategy for policy development and disease prevention (in press) In: *Proceedings of the Third Annual Symposium on Environmental and Occupational Health during Societal Transition in Central and Eastern Europe. Protecting Workers, the Environment and Health in a Market Economy: Translating Science into Policy and Action*, June 26 - July 1, 1992.

Mundt KA. The Workplace as Laboratory. *Business Digest*, June 1992;34.

Mundt KA, Chambless LE, Burnham CB and Heiss G. Measuring ankle systolic blood pressure: Validation of the Dinamap 1846 SX. *Angiology*, 1992;43(7);555-566.

Mundt KA. Letter to the Editor: RE: "Exposure to residential electric and magnetic fields and risk of childhood leukemia" and "Case-control study of childhood cancer and exposure to 60-HZ magnetic fields." *American Journal of Epidemiology* 1992;135(9);1070-1075.

Health, Safety and Environment Committee, International Chromium Development Association. *Health, Safety and Environment: Industry Guidelines*. Paris, France, April, 1992.

Pastides H, Miller JR, Mundt KA, Klar J, Adams RF, Olendorf T. A characterization of occupational static magnetic field exposures at a diaphragm-cell and a mercury-cell chlor-alkali facility. *Applied Occupational and Environmental Hygiene* 1992;7:42-48.

1991

Mundt KA. Epidemiological Review of the American Conference of Governmental Industrial Hygienists (ACGIH) Recommended Biological Exposure Index (BEI) for Urinary Mercury. The Chlorine Institute, September 30, 1991.

PUBLICATIONS AND REPORTS (continued)

Pastides H and Mundt KA. Resource Manual for Occupational Epidemiology, Chemical Manufacturers of America, Washington, D.C., 1991.

1990

Walker A and Mundt KA. Feasibility of Conducting an Industry-wide Study of Respiratory Cancer Related to Ceramic Fiber Inhalation, Final Report to Thermal Insulators Manufacturers Association (TIMA), Epidemiology Resources, Inc., Boston, MA, November, 1990.

Mundt KA. Immuno-epidemiology of crab-induced occupational asthma, doctoral dissertation, University of North Carolina, 1990.

1986

Pastides H, Mundt KA, McKnight CJ and Tuthill RW. Formulating case definitions and identifying cases for analysis (computer-assisted instructional software). In "Applied Epidemiology," Centers for Disease Control, Atlanta, Georgia, 1986.

Pastides H, Mundt KA, McKnight CJ and Tuthill RW. Descriptive analysis of the disease outbreak (computer-assisted instructional software). In "Applied Epidemiology," Centers for Disease Control, Atlanta, Georgia, 1986.

Pastides H, Mundt KA, McKnight CJ and Tuthill RW. Formulating and testing hypotheses (computer-assisted instructional software). In "Applied Epidemiology," Centers for Disease Control, Atlanta, Georgia, 1986.

Mundt KA. Distribution of selected mineral concentrations in urban children's hair. Masters thesis, University of Massachusetts, 1986.

1985

Tuthill RW and Mundt KA. An evaluation of hazard abatement activities in selected state-funded lead screening programs, Final report to Massachusetts House of Representatives Post Audit and Oversight Committee, June 27, 1985.

1979

Mundt KA and Polk BF. Identification of site urinary-tract infections by antibody-coated bacteria assay. *Lancet* 1979;2:1172-5.

Mundt KA and Polk BF. Predictive value of a single diagnostic test: a belated correction. *New England Journal of Medicine* 1979;300(15):859.

Interoffice
Communication

To: LCCP Employees

From: D. Penney, Research Manager/Toxicologist,
Corporate R & D

VISTA

Date: January 25, 1994

Subject: The International Agency for Research on Cancer's review of
Ethylene

In February of this year, The International Agency for Research on Cancer (IARC) has scheduled a review of the health effects information on ethylene. IARC, which is part of the United Nation's World Health Organization, is widely recognized for its role in designating chemicals as human cancer hazards. These designations have often resulted in the setting of stricter controls on chemicals by state and federal authorities.

Previously, IARC has listed ethylene as not classifiable as to human carcinogenicity because of a lack of any human or animal studies showing ethylene causes cancer. However, in its current review, IARC may reclassify ethylene as possibly carcinogenic to humans, despite a continued lack of any direct evidence linking ethylene with cancer in humans or animals. In fact, exposure of rats and mice to ethylene for two years in studies conducted by the National Toxicology Program failed to link ethylene with tumor formation. The reason that IARC may consider reclassifying ethylene is that certain studies have shown that ethylene gets converted in the body to a small amount of ethylene oxide, an animal carcinogen. Based on these studies, scientists calculate that breathing 40 ppm ethylene is equivalent to breathing about 1 ppm ethylene oxide. Because of the very small exposure to ethylene oxide that may occur as a result of breathing ethylene, some scientists speculate that ethylene is a cancer risk.

In contrast, other scientists think that the amount of ethylene oxide that gets produced in the body from exposure to ethylene is not large enough to cause cancer. This belief is based on research that shows that ethylene oxide must produce a certain level of a specific form of damage to cells before causing cancer. The Chemical Manufacturer's Association (CMA) has started studies at the University of North Carolina to find whether ethylene exposure produces enough of this kind of cell damage. So far, the CMA studies have not shown this kind of damage. This includes a study in which rats breathed 3000 ppm ethylene continually for 28-days. 3000 ppm ethylene is well above expected exposure levels in the workplace. CMA has plans for additional studies to be conducted this year to further investigate the question of ethylene's ability to produce cancer.