COX ASSOCIATES 503 Franklin St., Denver, CO, 80218. Ph 303-388-1778; Fax 303-388-0609
www.cox-associates.com

Committee on Energy and Commerce
U.S. House of Representatives
Witness Disclosure Requirement - "Truth in Testimony"
Required by House Rule XI, Clause 2(g)

1. Your Name: Louis Anthony (Tony) Cox, Jr.		
2. Are you testifying on behalf of the Federal, or a State or local government entity?	**Yes**	**No** ✓
3. Are you testifying on behalf of an entity that is not a government entity?	**Yes**	**No** ✓
4. Other than yourself, please list which entity or entities you are representing: None		
5. Please list any Federal grants or contracts (including subgrants or subcontracts) that <u>you or the entity you represent have received</u> on or after October 1, 2009: None		
6. If your answer to the question in item 3 in this form is "yes," please describe your position or representational capacity with the entity or entities you are representing:		
7. If your answer to the question in item 3 is "yes," do any of the entities disclosed in item 4 have parent organizations, subsidiaries, or partnerships that you are not representing in your testimony?	**Yes**	**No**
8. If the answer to the question in item 3 is "yes," please list any Federal grants or contracts (including subgrants or subcontracts) that were received by the entities listed under the question in item 4 on or after October 1, 2009, that exceed 10 percent of the revenue of the entities in the year received, including the source and amount of each grant or contract to be listed:		
9. Please attach your curriculum vitae to your completed disclosure form.		

Signature: [redacted] **Date:** 6/14/12

LOUIS ANTHONY (TONY) COX, JR., PH.D
Cox Associates, 503 Franklin Street, Denver, Colorado, 80218
(303)-388-1778 (Phone); (303)-388-0609 (Fax); tony@cox-associates.com

Tony Cox is President of Cox Associates (www.cox-associates.com), a Denver-based applied research company specializing in quantitative risk analysis, causal modeling, advanced analytics, and operations research. Since 1986, Cox Associates' mathematicians and scientists have applied computer simulation and biomathematical models, statistical and epidemiological risk analyses, causal data mining techniques, and operations research and artificial intelligence models to measurably improve health, business, and engineering risk analysis and decision-making for public and private sector clients. Since 1996, its sister company, NetAdvantage, has provided operations research services and software for telecommunications companies. In 2006, Cox Associates was inducted into the Edelman Academy of the Institute for Operations Research and Management Science (INFORMS), recognizing outstanding real-world achievements in the practice of operations research and the management sciences. In 2012, Dr. Cox was inducted into the National Academy of Engineering (NAE), "For applications of operations research and risk analysis to significant national problems." He is a member of the National Academies Standing Committee on the Use of Public Health Data in FSIS Food Safety Programs.

Dr. Cox holds a Ph.D. in Risk Analysis (1986) and an S.M. in Operations Research (1985), both from M.I.T; an AB from Harvard University (1978); and is a graduate of the Stanford Executive Program (1993). He is a member of the National Academies' Board on Mathematical Sciences and Their Applications (BMSA). He has been Honorary Full Professor of Mathematics at the University of Colorado, lecturing on biomathematics, health risk modeling, computational statistics and causality; on the Faculties of the Center for Computational Mathematics and the Center for Computational Biology at the University of Colorado at Denver; and is now Clinical Professor of Biostatistics and Informatics at the University of Colorado Health Sciences Center.

Dr. Cox is Area Editor for Mathematical Modeling for *Risk Analysis: An International Journal*, is a co-founder and Area Editor of the *Journal of Heuristics*, and is on the Editorial Board of the *International Journal of Operations Research and Information Systems*. He is an Edelman Laureate of INFORMS, a member of the American Statistical Association (ASA), and a Fellow of the Society for Risk Analysis (SRA). In 2007, he won the Society of Toxicology's Outstanding Published Paper in Risk Assessment Award and the Society for Risk Analysis Outstanding Risk Practitioner Award. In 2008, his solution to a challenge on "Statistical Methods to Predict Clinical Response" won an InnoCentive Award. His work won the Society for Risk Analysis (SRA) Best Paper Awards in both 2002 and 2003 for assessment of the uncertain public health risks and benefits of animal antibiotics; and in 2011 for mathematical modeling of chronic obstructive pulmonary disease (COPD).

Dr. Cox has taught many graduate and professional courses in risk analysis, decision analysis, forecasting and predictive modeling, data mining, operations research and computational and Bayesian statistics. He has authored and co-authored over 150 journal articles and book chapters on these fields. His most recent books are *Risk Analysis of Complex and Uncertain Systems* (Springer, 2009) and the *Wiley Encyclopedia of Operations Research and Management Science* (Wiley, 2011), which Dr. Cox co-edited and contributed to. He has over a dozen U.S. patents on applications of artificial intelligence, signal processing, statistics and operations research methods in telecommunications. His current research interests include computational statistical methods for causal inference in risk analysis, data-mining, and advanced analytics for enterprise risk management, insurance, and public policy applications.

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WORK HISTORY

1986 - Present	President, Cox Associates. Cox Associates is an independent Denver-based consulting company specializing in health, safety, and probabilistic risk analysis, applied statistical decision analysis, and operations research modeling for public- and private-sector clients. Cox Associates develops and applies quantitative risk assessment, uncertainty analysis, and decision optimization models and artificial intelligence and computational statistical models to measurably improve client decision-making. Since 1986, Cox Associates has created health risk models for many chemicals, chemical carcinogens, food-borne pathogens, and animal antimicrobials. Since 1996, its sister company NetAdvantage has also provided quantitative risk modeling, customer data mining, and network planning software solutions to telecommunications companies.
1987 - 1996	Senior Director for U S West Advanced Technologies in Boulder, Colorado. Headed Business and Engineering Modeling, Communications Services Research, and Network Architecture divisions; secured corporate and external funding commitments for $11M annual applied research budget; managed twelve director areas and over 100 professional engineers and scientists in the areas of management science and statistical and econometric modeling, optoelectronics, network architectures and technologies, network economics and performance analysis, wireless architecture and engineering, network evolution, product test and development, standards, international projects, digital signal processing, network optimization, and breakthrough projects.
1980 - 1986	Manager, Applied Decision Sciences practice area; Senior Consultant in Operations Research, Arthur D. Little, Inc., Cambridge, MA
1978 - 1979	Senior Research Associate, American Institutes for Research in the Social and Behavioral Sciences (AIR), Washington, D.C. and Cambridge, MA

Academic Affiliations

- Clinical Professor, Biostatistics and Informatics, University of Colorado
- Honorary Full Professor of Mathematics, University of Colorado at Denver (UCD) (http://math.ucdenver.edu/people/faculty.shtml)
- Faculty, Center for Computational Biology, UCD (www.cudenver.edu/ccb/associates.html)
- Adjunct Faculty member, Center for Computational Mathematics, UCD (http://ccm.ucdenver.edu/list.shtml)
- Advisory Board, Center for Human Performance and Risk Analysis (CHPRA), University of Wisconsin at Madison

Past Academic Affiliations

- Clinical Professor, Preventive Medicine and Biometrics, University of Colorado
- Instructor, Computer Science Department, University of Colorado at Denver. Taught courses on causal inference and computational statistical methods.
- Faculty, Daniels School of Business, Denver University, 1987, 1997. Taught courses on statistics and on wireless technology.
- Faculty, Leeds School of Business, University of Colorado at Boulder, 1993. Taught courses on decision analysis and statistical decision theory.
- Faculty, Harvard University Extension School, 1986. Taught course on decision and risk analysis.

EDUCATION

1986 - Present	Professional courses, seminars, and tutorials in statistical optimization, molecular and cell biology and toxicology, epidemiology, operations research, computational statistics, digital signal processing, image processing, artificial intelligence, biomathematics, and risk analysis.
1993	Stanford Executive Program, Stanford Business School
1985 - 1986	M.I.T., Ph.D. in Risk Analysis. Dissertation: *Mathematical Foundations of Risk Measurement*
1983 - 1985	M.I.T., S.M. in Operations Research, Department of Electrical Engineering and Computer Science. Thesis: *Attribution of Risk in the Presence of Joint Causes.*
1979 - 1983	Harvard University, graduate courses in applied mathematics, theoretical and applied statistics, psychometrics, and decision sciences
1975-1978	Harvard University, A.B. (Mathematical Economics)

ACADEMIC EXPERIENCE

Graduate Courses Taught

- *Health Risk Analysis,* University of Colorado Health Sciences Center, 2004; 2006
- *Causality, Inference, and Decision-Making,* University of Colorado at Denver, 2002, 2003
- *Decision and Risk Analysis,* University of Colorado at Boulder, 1993
- *Statistics for Business,* Denver University Graduate School of Business, 1987-88
- *Social Decision and Risk Management,* Harvard University Extension School, 1986

Professional Courses Taught

- *Advances in Health Risk Assessment and Modeling.* Invited lectures presented at Risk Assessment Unit at Evira (Finnish Food Safety Authority) Helsinki. October 22-23, 2009.
- Short Course on *Causality and Decision Analysis for Risk Analysts*. *Australia & New Zealand Regional Organisation of the Society for Risk Analysis. 3rd Annual Conference.* Canberra, Australia. September 29, 2008. http://www.acera.unimelb.edu.au/sra/SRA2008/Abstract-program.pdf
- *Probabilistic risk analysis: Assessment, management, and communication.* Harvard Center for Risk Analysis. Boston, MA. 2000-2004. Lectures on developing valid probability models from data, subjectivity in data analysis; Bayesian inference in multivariate data sets and causal modeling and influence diagrams for risk analysis.
- *Gordon-Kenan Risk Analysis Summer School in Risk Analysis* August 3-15, 2003 Roger Williams University Bristol, RI www.grc.uri.edu/programs/2003/risk.htm
- *Probabilistic risk analysis.* Professional course for Health Canada. Ottawa, Ontario. March 25th-28th, 2002. Lectured on "Using epidemiological data in risk assessment" and on "Causal graphs, Bayesian belief networks, and influence diagrams: A framework for risk assessment and risk management".
- *Advanced Methods for Dose-Response Assessment: Bayesian Approaches*. Resources for the Future Conference Center, Washington, D.C. September 18th-20th, 2000 http://www.rff.org/disc_papers/PDF_files/0115.pdf.
- "Bayesian methods for assessing uncertain exposures", *Workshop on Probabilistic Methods for Risk Assessment.* Society for Risk Analysis, Phoenix, Az, 12-06-98.
- *Advances in Wireless Technology*, Denver University, Fall, 1997
- *Introduction to Decision Analysis for Risk Management,* United States Department of Agriculture's APHIS Introductory Risk Analysis course, University of Maryland Conference Center, July 9, 1992.
- *Risk Assessment Modeling*, one-day short course given at the USDA Training Center, APHIS Risk Assessment Course, Fort Collins, CO, July 23-24, 1992.
- *Technical Risk Communication,* short-course given at the Greenbelt Marriott Hotel, APHIS Advanced Risk Communication Course, Greenbelt, MD, August 20, 1992.
- *Biologically-Based Risk Assessment.* Short course, Society for Risk Analysis, 1991.

Science Enrichment Courses for Elementary School Children

At the Ricks Center for Gifted Children at the University of Denver (www.du.edu/ricks/)

- *Natural and Artificial Life, Evolution, and Intelligence* (Spring, 2010)
- *Science Basics: Introduction to Cosmology and Earth Science* (Spring, 2010)
- *Matter, Energy, and Technology* (Spring, 2009)

- *Introduction to Materials Science* (Spring, 2009)
- *Basic Cell Biology* (Fall, 2008)

Dissertations Supervised

Dr. Cox has served on S.M. and Ph.D. thesis committees at the University of Denver (S.M. thesis on genetic algorithms) and the University of Colorado (S.M. thesis on innovations in voice messaging, 1995; Ph.D. thesis on classification trees for learning forecasting models from data, 1999; MS thesis on ant colony optimization for bandwidth packing, 2000; MS project on data mining and causal simulation modeling, 2000; Ph.D. thesis on uncertainty analysis in epidemiology, 2003.)

Research Collaborations

At U S WEST Advanced Technologies, Dr. Cox initiated and led collaborative research projects with top researchers at many universities, including

- Harvard University (projects on combinatorial optimization and on interactive mixed natural language and graphics dialogue interfaces, with Professor Barbara Grosz)
- Columbia University (dynamic traffic routing with Professor David Yao)
- Syracuse University (machine comprehension of scientific abstracts)
- Oregon Graduate Institute (breakthroughs in neural net and digital signal processing technologies for automated speech recognition with Professor Ron Cole).

In 1992, his collaboration with mathematicians at the University of Colorado at Denver on combinatorial optimization heuristics for network routing was selected by the Colorado Advanced Software Institute (CASI) as one of only two projects (out of 30) that exemplified this state-funded Institute's major goals: outstanding industry-university technical research with high commercial value. In 1993 and 1994, his collaborations with UCD on new data mining algorithms and pattern recognition techniques for risk analysis and fault diagnosis algorithms were the only projects to receive CASI's award. Dr. Cox has also collaborated with colleagues at Bell Labs and the University of California on fundamental research in multistate reliability and biomathematical modeling.

Conference Sessions Chaired

Dr. Cox has chaired many conference sessions, including the following:

- *Novel Approaches in Dose Response.* Society for Risk Analysis 2010 Annual Meeting. Salt Lake City. December 7, 2010.
- *Sustainable Value Chains.* Institute for Operations Research and Management Science annual conference, Austin, TX, 2010. http://meetings2.informs.org/Conf/Austin2010/images/split%20pdfs/tracks/Austin%20Service%20Science%20Sections.pdf
- *Security and Resilience in Telecommunications Networks.* Institute for Operations Research and Management Science annual conference, Washington, D.C., 2008. https://informs.emeetingsonline.com/emeetings/formbuilder/clustersessiondtl.asp?csnno=8108&mmnno=176&ppnno=33560
- *Animal Pathogens and Human Exposure.* Society for Risk Analysis annual conference, San Antonio, TX, 2007. (Substituted for Dr. Michael McElvaine as chair.)

- *Alternative Approaches to Risk Assessment*. Society for Risk Analysis annual conference, San Antonio, TX, 2007. http://birenheide.com/sra/2007AM/program/
- *Complexity in Modeling Mode-of-Action and Other Sources of Non-Linearity In Risk*. Society for Risk Analysis annual conference, Baltimore, MD December, 2006.
- *Statistical Methods: Uncertainty, Confidence Limits, etc.* Society for Risk Analysis annual conference, Palm Springs, December 5-8, 2004.
- *Toxicology*. Session at Non-Linear Dose-Response Relationships in Biology, Toxicology, and Medicine: An International Conference. (University of Massachusetts, Amherst, MA, May 28-30th, 2003)
- *Special Applications in Industry and Government.* (Society for Risk Analysis, 2002)
- *Market Modeling and Policy* (INFORMS Telecommunications Conference, 2002)
- *Wireless Network Planning* (INFORMS Telecommunications Conference, 2002)
- *Optical Networks* (8th International Conference on Telecommunications Systems, 2000.)
- *Telecommunications* (INFORMS, 2000)
- *Marketing* (INFORMS, 1999)
- *Forecasting and Economics* (INFORMS Telecommunications Conference, 1998)
- *Stochastic Optimization* (Society for Industrial and Applied Mathematics, SIAM, 1996)
- *Planning Heuristics for Telecommunications Networks* (INFORMS, 1996).
- *Risk and Uncertainty*
- *Artificial Intelligence Heuristics for Optimization*
- *Heuristic Optimization for Process Improvement.*
- Cluster chair for INFORMS sessions on "*Heuristic Optimization and Learning*" (1994).

Other Academic Experience

From 1987-1992, Dr. Cox served on the Industry Advisory Board of the Mathematics Department at the University of Colorado at Denver, where he is now Honorary Full Professor of Mathematics and on the Faculty of the Center for Computational Mathematics. He has given invited talks on advanced topics in risk analysis, telecommunications engineering and management, and computer science to faculties and graduate seminars at many top universities. He is Area Editor (Mathematical Modeling) of *Risk Analysis: An International Journal* and is Area Editor (Real-World Applications) of the *Journal of Heuristics*, which he helped to found in 1995. He is on the Editorial Board of the *International Journal of Operations Research and Information Systems*. He has reviewed many academic research proposals for the National Science Foundation's Decision, Risk, and Management Science program and SBIR technology proposals for NSF and other agencies. He has lectured on biomathematics, cancer risk modeling, data mining, and other statistical, mathematical, and analytics topics at the University of Colorado. Dr. Cox co-taught a short-course on *Biologically-Based Risk Assessment* at the Society for Risk Analysis Annual Meeting in 1991; a workshop on *Probabilistic Methods in Risk Assessment* at the Society for Risk Analysis Annual Meeting in 1998; and taught a *Short Course on Causality and Decision Analysis for Risk Analysts* at the Australia & New Zealand Regional Organisation of the Society for Risk Analysis in 2008.

CONSULTING EXPERIENCE

Examples of applied statistics, epidemiology, operations research, and health risk analysis projects completed by Dr. Cox in the past decade include the following:

RISK ANALYSIS AND APPLIED STATISTICS CONSULTING EXPERIENCE

- For the Institute of Medicine (IOM), served as a reviewer for the *IOM Draft on Scientific Standards for Studies of Modified Risk Tobacco Products*, examining the types of biomarker data and other scientific information needed to demonstrate to FDA that new products have reduced risks (2011)
- Served as expert reviewer for EPA's *Draft Microbial Risk Assessment Guideline: Pathogenic Microorganisms with Focus on Food and Water* (2011)
- For the U.S. EPA, served as a member of the Science Advisory Board (SAB) for Dioxin (2010-11)
- For the National Pork Board, prepared comments on a Russian risk analysis of tetracycline residues in foods. These comments provided the technical basis for the USG's position in trilateral trade negotiations with the EU and Russian Federation (2011)
- For the Colorado state police, analyzed the frequency and severity of car accidents by time of day, time of year, driver age and sex, driver behavior (e.g., alcohol use, use of safety devices), and types of air bags and oher equipment. Developed an injury prediction model that successfully predicted risks of injury, given an accident, from less than 20% to over 70%, based on preventable causes. (2011)
- For the National Mining Association, developed a statistical critique of a proposed quantitative risk assessment for respirable coal mine dust (2010-11)
- For the American Chemistry Council's Crystalline Silica Panel, modeled exposure-response relationships for inflammation-mediated lung diseases and lung cancer risk caused by exposure to quartz dust and crystalline silica. Presented key results and references to Canadian regulators in August, 2010. Health Canada subsequently proposed to regulate crystalline silica as a threshold carcinogen, breaking new ground in science-based regulatory risk analysis for this compound. (2010)
- For the National Pork Board, assessed human health risks of multidrug-resistant "superbug" bacterial infections originating from pigs (2010)
- For Philip Morris International, developed a quantitative model of age-specific risks of chronic obstructive pulmonary disease (COPD) as a function of smoking history (2008-2009). Clarified the interaction of molecular biological pathways in forming positive feedback loops that trigger and sustain this disease.
- For the National Pork Board, reviewed statistical and causal analyses of infant mortality and livestock production (2009)
- For the American Chemistry Council's Crystalline Silica Panel, critically reviewed draft regulatory risk assessments of crystalline silica as a toxic substance and possible lung carcinogen (2009)
- For Alpharma and Phibro Animal Health, assessed potential human health risks from use of tetracycline drugs in food animals (2009)
- Member of National Academy of Sciences (NAS) Committee on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis. (2006-8) http://www8.nationalacademies.org/cp/CommitteeView.aspx?key=48682
- Member of Environmental Protection Agency Science Advisory Board (EPA SAB) on Asbestos. http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommitteesSubcommittees/Asbestos%20Committee
- Member of Institute of Medicine's (IOM) Committee on Aerospace Medicine and the Medicine of Extreme Environments (2006-8), Committee to Review NASA's Space Flight Health Standards
- For Comcast Cable, worked in partnership with North Highland consulting company to develop a customer churn predictive risk assessment model that successfully predicts which customers are most likely to drop services and accounts – months before the drops occur, while there is still time to intervene. The model was statistically compared to existing commercial predictive models and found to be more than twice as effective in identifying high-risk customers early on.
- Delegate to First Session of the *Codex Ad Hoc Intergovernmental Task Force on Antimicrobial Resistance* held in Seoul, Republic of Korea, 23-26 October 2007.

- For Xcel Energy, worked in partnership with North Highland consulting company to develop a credit risk assessment model that predicts which customer accounts are likely to become bad debts six months or more in advance, when early intervention is still possible and profitable (2007)
- For Qwest Communications, worked in partnership with North Highland consulting company to analyze the amounts of time that employees spend managing internal communications (e-mails, meetings, conference calls, etc.) and identifying opportunities to improve internal communications efficiency (2006).
- For Philip Morris International, developed a quantitative model of age-specific risks of lung cancer as a function of smoking history. Estimated the potential reduction in lung cancer risk for smokers if cadmium were removed from tobacco products. (2005-2007)
- For Qwest Communications, worked in partnership with North Highland consulting company to quantify customer interest in and willingness to use improved web portals to manage telecommunications services (2006-7).
- For a sand and gravel company, examined the usefulness, for estimating risks and setting prioriries, of aggregate exposure metrics for mixtures of asbestos and non-asbestos fibers and particles (2006)
- For a telecommunications equipment manufacturer, created a model to predict the numbers and types of equipment failures expected in future years, based on historical failure data for equipment items manufactured in different years. (2006)
- For a grass seed company, assessed the quantitative risks of gene flow from genetically modified grasses into the environment via pollen and seeds (2006). This approach was subsequently adopted by the United States District Court for the District of Columbia as a basis for risk calculations (http://www.centerforfoodsafety.org/pubs/GTBC_Doc_94_Opinion%202-5-07.pdf)
- For a homeowner's association, quantified the probable number and timing of future failures in copper pipes due to thermogalvanic corrosion. The model correctly predicted the near statistical certainty of additional pipe failures (2006).
- For the National Research Council of the National Academy of Sciences (NAS), advised on modeling potential failures and threats to spent nuclear fuel rods stored in different types of containers. This work contributed to the 2006 NAS report *Safety and Security of Commercial Spent Nuclear Fuel Storage*, http://www.nap.edu/openbook/0309096472/html/R4.html.
- For a large pharmaceutical company, analyzed Phase 3 clinical trial data and showed that a major drug is highly effective in reversing symptoms of a disease in patients in both the short run (within 1-2 weeks) and over a longer time frame. This statistical analysis of the time course of responses and the clusters of different response histories among patients explained several previously unresolved puzzles and made the meaning of the data clear for company statisticians and decision-makers. (2005)
- For a law firm specializing in construction defect litigation, developed an approach to sampling available homes or units to support efficient statistical inference from available data, even when some homes or units cannot be inspected. (2005)
- For Phibro Animal Health, developed a systems dynamics model of the evolution of illnesses and resistance in human and animal populations. (2005/2006)
- For the American Chemistry Council, assessed the potential human health risks associated with methyl bromide (2005).
- For Philip Morris Intenational, developed new ways to integrate partial knowledge of causal mechanisms of lung carcinogenesis with statistical information (mainly epidemiological and molecular epidemiological data) to obtain quantitative bounds on the fraction of lung cancers that can be prevented by removing specific components of exposure and/or blocking specific causal pathways. (2004-2006)
- For the cattle industry group R-CALF, developed a value of information (VOI) model for assessing the economic value of tracking Canadian cattle in the US in light of recent BSE findings (2004).
- For the Animal Health Institute, developed a Rapid Risk Rating Technique (RRRT) to quantify the human health impacts of food-borne pathogens and animal antimicrobial uses (1Q-04)
- For Elanco Animal Health, served on an Expert Panel to develop a mathematical model of the human health benefits of decreasing microbial loads in food animals (2003-4)
- For Phibro Animal Health, developed a quantitative risk assessment of the human health risks and benefits from continued use of virginiamycin in chickens and pigs (2002-4)
- For the Animal Health Institute, served on an Expert Panel to review human health risks from animal antibiotics (2002-3); developed a farm-to-fork risk simulation model for Campylobacter risks (2000-2002)

- For the U.S. Environmental Protection Agency, served as an external expert reviewer for the EPA's "Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization" Draft External Review Document (March, 2002).
- For the World Health Organization (WHO), served as an external expert reviewer for a Consultation on *Campylobacter* risk assessment, in Geneva (August, 2001)
- For the U.S. Food and Drug Administration (FDA), (a) Reviewed proposed approaches to antimicrobial risk assessment (1999) http://www.fda.gov/cvm/antimicrobial/tonycox/index.htm; and (b) Proposed a decision-analytic alternative to FDA's threshold approach for managing risks of resistant strains of pathogenic bacteria due to use of antibiotics in animals (2001). The FDA at first strongly rejected Dr. Cox's advice and testimony on how to do antimicrobial risk assessment correctly (with considerable acrimony, in the context of enrofloxacin litigation), but has subsequently had Dr. Cox visit to discuss several antimicrobial risk assessments, and has sought Dr. Cox's views on how to do better risk analysis.
- For the U.S. EPA, served as expert external reviewer and contributor to *Review of Uncertainty and Variability Analysis In IRIS for Eight Substances.* http://www.epa.gov/ncea/hlthfx_iris.htm
- Created computer simulation models (PBPK and PD) of dose-time-response relations for low-level exposures to chemical carcinogens, for Exxon Biomedical Sciences (EBSI). Developed an artificial intelligence method for improving prediction of likely human chemical carcinogens, also for EBSI.
- Created a discrete-event stochastic simulation model of the human health risks associated with Ciprofloxacin resistance in Camplyobacter jejuni induced by use of Enrofloxacin in chickens, for the Animal Health Institute (AHI). http://www.cvmbs.colostate.edu/cveadss/schedule/SchedulePage.htm
- Critically reviewed epidemiological studies of diesel exhaust and human lung cancer risk, for the Engine Manufacturers Association.
- For the American Petroleum Institute (API), created a computer simulation model of bone marrow and blood cell toxicity caused by cyclophosphamide, an immunosuppressive drug. Designed laboratory experiments to validate the model's predictions. Analyzed clinical and laboratory data to test model's predictive validity. Prepared a software release so that other scientists could use the model.
- Reviewed literature on air pollution and human lung cancer risks, for the American Petroleum Institute.
- Applied adaptive spatial sampling to optimize search and clean-up efforts for remediating residential properties around an abandoned hazardous waste site (for AlliedSignal)
- Reassessed human cancer risks from 1,3-butadiene using pharmacokinetic modeling to adjust for interspecies differences in internal doses of epoxybutene (for the Chemical Manufacturers Association)
- Reassessed the human leukemia risks from benzene exposure using a physiologically-based pharmacokinetic (PBPK) model to calculate internal dose (for the American Petroleum Association)
- Reviewed design of an initiation-promotion experiment for studying the potential carcinogenicity of a rubber additive, for Goodyear Tire and Rubber Company.
- Developed a general physiologically-based pharmacokinetic (PBPK) modeling software tool for rapidly developing high-quality PBPK models (with ENSR Consulting and Engineering, Inc.)
- Reviewed artificial intelligence approaches to characterizing uncertain health risks using weight of evidence, nonmonotonic, and other uncertainty analysis (for Lawrence Berkeley National Laboratory)
- Assessed potential health risks associated with occupational exposure to herbicides among roadside workers, using pharmacokinetic models, for a Fortune 100 chemical manufacturer.
- Recommendation of cleanup priorities for a large hazardous waste site in Canada
- Developed a prototype computer model for biologically based risk assessment of chemical carcinogen risks, for the Western States Petroleum Association (WSPA) and the American Petroleum Institute (API)
- Reviewed new biostatistical and "biologically based" approaches to cancer risk analysis, for the California Department of Health Services
- Reviewed regulatory history of benzene risk assessments and of biomathematical approaches to modeling leukemogenesis for the Western Oil and Gas Association and the American Petroleum Institute
- Prototype computer modeling of the AIDS epidemic (with Arthur D. Little, Inc.)
- Designed a 2-year bioassay experiment for isoprene. Analyzed and reported the resulting experimental data for a multi-client, multinational industry group coordinated by Exxon Biomedical Sciences.
- Accident risk analysis and consequence analysis of a petrochemical storage facility in California, for a California-based environmental consulting firm

- Implemented a Macintosh version of a physiologically-based pharmacokinetic (PBPK) model for benzene pharmacokinetics and total metabolism in rodents and humans, for the API
- Explored new mathematical approaches and conceptual frameworks for dealing with scientific uncertainties in biologically-based risk assessment, for the Western States Petroleum Association (WSPA)
- Created an interactive data analysis and graphics package for determining the degree of worker protection provided by different respirators, filters, and face masks (with Arthur D. Little, Inc.)
- Microeconomic and applied probability modeling of insurance company business risks for use in tax litigation (with Arthur D. Little, Inc.)
- Critically reviewed a transportation risk analysis for liquefied natural gas (LNG) operations in the St. Lawrence seaway.
- Reviewed progress since 1985 in using decision analysis for accident risk assessments.
- Implemented an experimental "intelligent" data base management system for chemical health effects data bases (with Exxon Biomedical Sciences, Inc.)
- Uncertainty analysis of PBPK modeling and risk analyses, accounting for model uncertainties and population heterogeneity, for the American Industrial Health Council.
- Developed new statistical techniques to predict cancer risks associated with mineral oils, for Mobil Oil.

DATA MINING AND STATISTICAL MODELING AND PREDICTIVE ANALYTICS EXPERIENCE

- For Rogers Communications, developed causal models of customer satisfaction; identified high-impact interventions for improving customer satisfaction; helped to develop achievable targets and strategies for improving customer experiences in different channels (2011)
- Delivered a statistical analysis of the causal drivers of customer satisfaction to top executives at Comcast Cable; identified realistic targets and interventions for improving customer satisfaction (2010-11).
- For a top cable company, worked in partnership with North Highland consulting company to deliver a predictive model that identifies which customers are most likely to drop accounts, well before the event and with much higher accuracy than previous models. (2008)
- For an energy utility, worked in partnership with North Highland consulting company to deliver a predictive model of customer bad debt and account write-offs that greatly extended the lead time over which high-risk customers could be identified and targeted for intervention. (2007)
- For a telecommunications company, worked in partnership with North Highland consulting company to develop a predictive model of customer marketing channel choice, and usage as a function of quanlity of channel experience (e.g., for web site, call center, retail store, and other channels.) Used the model to quantify financial impacts of improving web-based customer care. (2006)
- Also in partnership with North Highland consulting company, analyzed employee survey data for a major telecommunications provider and quantified patterns of internal communications (conference calls, managing e-mail, company news letters and bulletins, meetings, etc.); time spent on these activities by employees with different job roles and in different VP areas; and potential to reduce employee burden and improve the value and efficiency of internal communications. (2006)
- For a European wireless telecommunications provider, analyzed customer data to help develop more predictive segments; held a one-day intensive course in Brussels on advanced statistical models and methods for quantifying customer value in the short and long runs, based on probability and statistics models of customer behaviors in response to company offers. (2005)
- In 2004, delivered to an international telecommunications company a needs-based predictive segmentation model for cell phone customers.
- In 2003, in partnership with North Highland consulting company, delivered to a directory company a credit scoring and data mining model for identifying customers at greatest risk of defaulting on Yellow Pages agreements.
- In April, 2002, delivered to an internet services provider (ISP) a decision-support model for predicting customers with the highest churn potential and recommending specific interventions to reduce churn. This system was found by the client to reduce churn by over 40% within 4 months among at-risk customers.
- In March, 2002, delivered to a financial services company a set of predictive clusters for simultaneously predicting churn, upsell, and cross-sell potentials for existing customers. The predictive validity, stability, and high practical value of the predictive clusters were confirmed by the client in 2003 and 2004.

- In October, 2001, completed a study to identify ways to predict which competitive local exchange carrier (CLEC) customers would experience the most revenue growth in the next quarter and which would be most likely to drop accounts.
- In August, 2001, completed an analysis of insurance customer data showing that combining information from homeowner, auto, and other insurance lines using classification trees and transition models could dramatically improve accurate identification of cross-sell, up-sell, and retention opportunities.
- In December, 2000, completed a study of purchasing patterns among large business customers for Qwest communications. The results show that a few key products, together with factors such as account age, predict likely stability or churn of customers, as well as likely growth potential.
- In 2Q, 2000, delivered to statistical analyses of the effects of U S WEST and competitor advertising and publicity (including brand/service commercials, direct mail, and news stories) on customer ratings of value and loyalty.
- Analyzed marketing data for AT&T-TCI to determine which current cable customers are most likely to switch to digital cable in the next quarter, based on current cable, telephony, and demographic risk factors.
- Created and validated a statistical (semi-Markov state transition) risk model to predict product and account attrition among U S WEST customers. Delivered to the CRMS group in U S WEST Communications a predictive model for identifying the likely future purchasing, product-drop, and account disconnect behaviors of individual customers. The new model has significantly greater predictive power than previous ones, achieving lifts of several hundred percent on the task of predicting which 10% of customers are most likely to buy specific products in the next few months.
- Developed new statistical optimal matching procedures to decide which products to offer which customers to maximize average revenue yield and lifetime revenue value for U S WEST Communications. Demonstrated a potential increase of over 40% for short-term revenues. 15% revenue increase was achieved in a preliminary in-market trial of intelligent scripting.
- Used a new causal modeling and data-mining technique to predict likely future product purchases from past purchase data and demographics, for U S WEST Consumer Services Group.
- Created a new forecasting model for application to short-tem and cross-sectional market data. The new method combined classification tree analysis with compartmental flow simulation. Applied to real data, it successfully allowed growth in demand for access lines to be predicted as accurately using less than 6 months of data as was previously possible using over 5 years of data with conventional time series forecasting methods. The forecasts were used by U S WEST Communications in 1997.
- Created and implemented a combined machine-learning/transition simulation forecasting technique to use detailed call records to more accurately predict traffic loads arriving at different locations within a wireless network for PrimeCo Personal Communications Services Ltd.
- Developed a simulation-based model of cable customer transitions among different behaviors (adding and dropping basic and enhanced cable services, switching among services and locations, etc.) for TCI.
- Analyzed cable franchise data for over 400 TCI cable systems to identify predictors of service quality perceptions and churn. Successfully identified unexpected demographic predictors of profitability and satisfaction.
- Analyzed macroeconomic data and survey data for a consortium of Indonesian companies to predict the penetration of telephony, PCs, internet services, and cable over the next 15 years.

CONSTRUCTION DEFECT LITIGATION SUPPORT EXPERIENCE

Dr. Cox has testified as an expert statistician in numerous construction defect cases, typically seeking to clarify the types of valid statistical inferences about risks and defects that can be drawn from limited sample data. Dr. Cox has been deposed on statistical issues in the following construction defect cases since 2006.

- *Amezcua/Pua v. DR Horton* Deposition in Arizona, 2/2/2010
- *Amukamara/Larissa by Forecast* Deposition in Arizona, 4/10/2007
- *Arrants v. D.R. Horton* Deposition in Arizona, 8/3/2010
- *Aspen Creek* Deposition in Arizona, 5/22/07
- *D.R. Horton, Inc.-Denver vs. Canyon Creek Condominium Association, Inc.* Deposition in Colorado, 12/10/2010
- *Centercrest* Deposition in Arizona, 3/14/2006
- *Chaignot v. Beazer* Deposition in Arizona, 4/22/2010

- *Cummings v. Lenar* Deposition in Arizona, 9/21/2006
- *Dancy* Deposition in Arizona, 11/09/2006
- *Ensley et al. vs. Forecast Homes* Deposition and trial in Arizona, 11/09/2009
- *Frye Park Townhomes HOA v. Patterson Development LP* Deposition in Arizona, 4/22/2010
- *Goree v. Monterey Homes* Deposition in Arizona, 11/30/2006
- *Greenwood Estates* Deposition in Arizona, 10/11/2010
- *Landmark Towers* Deposition in Arizona, 7/29/11
- *Paloma Paseo* Deposition in Arizona, 10/13/2007
- *Premier* Deposition in Arizona, 3/10/2009
- *Raintree* Deposition in Arizona, 8/3/2007
- *Sun City Grand* testified to arbitration panel, 7/22/2011
- *Terravita* Deposition in Arizona, 10/6/2006
- *Windrose East* Deposition in Arizona, 3/10/2009

TELECOMMUNICATIONS NETWORK DESIGN AND OPTIMIZATION EXPERIENCE

After leaving U S WEST Advanced Technologies, Dr. Cox has led the following projects.

- SONET-DWDM and mesh planning tools that allow for unspecified (any-to-any) demands and incremental planning with ring, mesh, or hybrid protection and resilience against multiple simultaneous fiber cuts or other failures (2005-2011).
- Led delivery of a hybrid ring/mesh architecture network planning software tool to Sprint (2004)
- Led delivery of a combined SONET-DWDM mesh topology design tool to Tellabs, Inc. (2003)
- Developed network planning, optimization, and risk analysis tools for a satellite company (3Q-02)
- Created a competitive cost model for Sprint's national optical network (1Q-3Q, 2002)
- Delivered a Passive Optical Network (PON) configurator tool to a PON equipment vendor (1Q-02)
- Delivered to Sprint a port-level SONET ring planning tool. An initial version of the tool was successfully used in creating Sprint's 2002 network build plan (4Q-01)
- Delivered to Redback Networks of a card-level SONET ring planning and optimization tool (3Q-01). This software tool is now marketed commercially by Redback Networks.
- Delivered to Sprint a dark fiber network configuration planning tool, incorporating a proprietary genetic algorithm, that reduced costs of metro-area networks by over 50% compared to manual solutions. (1Q-01 for fiber-only version, 3Q-01 for version with wireless link options)
- Delivered to Tellium a Dense Wave Division Multiplexing (DWDM) mesh topology design tool, marketed commercially as StarNet Planner. (4Q-00)
- Delivered to Kestrel Solutions a SONET Ring Planning tool for optimizing placement of optical add-drop multiplexer components in optical ring networks. (3Q-00)
- Created a new design for a backhaul network in Colorado that saved AT&T Wireless over 20% on their monthly backhaul charges. The new design, based on large-scale integer programming optimization, re-assigned traffic to hubs and recommended adding two new hubs to reduce system costs. (1999)
- For Sprint PCS, analyzed market demand forecasts and switching and interconnect costs. Led development of a a 20-period network growth and capacity planning and optimization software model. Identified a way to save over $1M (approximately 10%) of network capital expenses for a small city by reconfiguring the initial choice of switch modules to allow a more efficient capacity expansion growth path (1997).
- For Cox California PCS, led development of a backhaul network optimization program, solved via a new genetic algorithm, that reduced monthly backhaul costs by over 10% through more efficient of digital circuits to hubs and more economical use of SONET facilities.
- For PrimeCo Personal Communications Services, Ltd., created an optimization model of Multi-Channel Controller Card assignment and inventory management to reduce the costs of expanding network capacity through base station capacity upgrades.

PREVIOUS INDUSTRY EXPERIENCE

Before starting Cox Associates in 1986, Dr. Cox consulted in statistics, health and safety risk analysis, operations research, computer science, and econometrics for Arthur D. Little, Inc. He managed multimillion dollar AI risk analysis software development projects for the U S Air Force and led cases covering environmental fate and transport modeling of pollutants, risk analyses for transportation and processing facilities, reliability modeling of complex systems, and a variety of product development, insurance, R&D, computer security, and electric utility applications. He also acted as an expert statistician and economist in support of several contract, tort, and administrative law cases and contributed to projects on USDA Standards and Grades for food products, statistical analysis of cigarette smoking data, safety of different types of protective masks, etc.

In 1984, Dr. Cox won Arthur D. Little's Presidential Award for outstanding contributions to the development of R&D planning and risk assessment methodologies for the Electric Power Research Institute (EPRI).

Prior to joining Arthur D. Little, Inc., in 1979, Dr. Cox worked in societal risk analysis, experimental cognitive psychology of text processing, and applied statistics, at the American Institutes for Research (AIR). He also co-authored a book on the effects of court sanctions on the risks of chronic delinquent behavior, featured on *Good Morning America* in 1979 and still widely cited (e.g., http://www.ncpa.org/bg/bg148/bg148b.htm, http://www.theatlantic.com/politics/crime/wilson.htm,).

OTHER TECHNOLOGY EXPERTISE

Dr. Cox was U S WEST Advanced Technologies' expert on statistics and econometrics, artificial intelligence, decision and risk analysis, and digital signal processing technologies, emphasizing pattern recognition, spoken language understanding, and machine-learning applications.

He has appeared on CNN and has been interviewed by KGNU Radio, the *Wall Street Journal*, *Newsweek*, and various newspapers about profitable business applications of these and related technologies. He frequently represented U S WEST to regulators and utility commissions in explaining the purpose, value, and accomplishments of U S WEST's work these areas. Dr. Cox has been interviewed many times about topics related to human health risks of chemicals and antibiotics. A presentation by Dr. Cox on animal antibiotic risks is described in the Science section of *The New York Times* (2006) http://www.nytimes.com/2006/02/21/science/21cafe.html

Dr. Cox has also been interviewed by *The Washington Post* (2005). *The Denver Post* (2005) and other national newspapers about potential risks of BSE ("mad cow" disease) in the US from imported Canadian cattle. (http://www.mymontana.com/?template=mymon_news_art&nid=3217; http://www.mycattle.com/news/dsp_national_article.cfm?storyid=16360). He has been interviewed and quoted on a variety of topics related to quantitative risk assessment and modeling, including dose-response hormesis (http://pubs.acs.org/subscribe/journals/esthag-w/2006/oct/science/rr_hormesis.html), infectious diseases, threats to children's health from chemicals, resistance to animal antibiotics (2010) (www.feedstuffsfoodlink.com/ME2/dirmod.asp?sid=&nm=&type=news&mod=News&mid=9A02E3B96F2A415ABC72CB5F516B4C10&tier=3&nid=8E922C15C43F43D39AB19CE4469A12BE), and terrorism risk analysis (2010) (http://www.publicintegrity.org/daily_watchdog/entry/2428/).

PROFESSIONAL ACTIVITIES

Professional Societies

- Society for Risk Analysis (SRA). Fellow since 1993. (Fellowship recognizes lifetime contributions to the field of risk analysis)
- Institute for Operations Research and the Management Sciences (INFORMS), Edelman Laureate since 2006 (recognizing outstanding achievement in the practice of OR/MS.).
- Member of the American Statistical Association since 1993.

Positions Held

- Treasurer of the Society for Risk Analysis (SRA), 2007-8; Treasurer-Elect, 2006
- Elected as one of two Counselors for the 400-member ORSA Special Interest Group on Telecommunications, 1992
- Member of the International Life Sciences Institute's (ILSI's) Risk Science Institute Cancer Dose-Response Working Group in 1991-1992.
- Counselor, Rocky Mountain Chapter of the SRA, 1990-1991
- Secretary and co-founder, New England Chapter of the SRA, 1985-86

Selected Awards and Honors

- *2012 Inducted into the National Academy of Engineering,* "For applications of operations research and risk analysis to significant national problems." www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=02092012
- *2011 Best Paper Award*, Society for Risk Analysis, for A causal model of chronic obstructive pulmonary disease (COPD) risk. http://www.sra.org/journal_best_paper_awards.php
- *2008 Innocentive Challenge Award.* In 2008, Dr. Cox's proprietary solution to a challenge on "Statistical Methods to Predict Clinical Response" won an InnoCentive Award from Eli Lilly (http://www.innocentive.com/servlets/project/ProjectInfo.po?s=AW).
- *2007 Outstanding Practitioner Award*, recognizing excellent performance in the practice of risk analysis. Awarded by the Society for Risk Analysis. San Antonio, TX, December, 2007.
- *Outstanding Published Paper in 2006 Demonstrating an Application of Risk Assessment*, awarded by the Risk Assessment Specialty Section of the Society of Toxicology, March, 2007.
- *Franz Edelman Finalist Award*, for achievement in the practice of Operations Research and the Management Sciences, awarded by the Institute for Operations Research and Management Science (INFORMS), 2006.
- *Best Reviewer, Decision Sciences*, for *Risk Analysis: An International Journal*. 2006
- *Best Paper Award*, Society for Risk Analysis, 2003 www.sra.org/newsletter/news0204.pdf
- *Best Paper Award*, Society for Risk Analysis, 2002, www.sra.org/news0203.pdf
- *POMS National Award Finalist* for paper: Cox LA, Bell G, Glover F. A new learning approach to process improvement in a telecommunications company. *Production and Operations Management*, 4, 3, 217-227, 1995. Production and Operations Management Society
- *INFORMS Prize* for best real-world applications of operations research having substantial business value, 1994
- Fellow of the Society for Risk Analysis, 1993

At U S WEST Dr. Cox also received many awards. Under his leadership, in 1994, U S WEST won the Operations Research Society of America's prestigious INFORMS Prize, awarded annually to the company in the world that has best applied operations research methods in innovative ways that have had profound business impact. In 1991 Dr. Cox won U S WEST's Special Achievement Award for developing new approaches to business risk analysis widely applied by U S WEST International. In 1992, he won the U S WEST's Chairman's Award and two Special Achievement Awards for innovations in network design credited with saving U S WEST over $100M. In 1994, Dr. Cox won U S WEST's new President's Club and Circle of Excellence Awards for innovations in probabilistic analysis of customer choice behavior.

LOUIS ANTHONY COX, JR. – PATENTS

Dr. Cox has applied risk analysis, statistical decision theory, and optimization principles to several fields in new ways. He is inventor or co-inventor of the following innovations.

Speech Synthesis Using Perceptual Linear Prediction Parameters (U.S. Pat. # 5,165,008, awarded November 17, 1992. Canadian Patent #2,074,418 awarded December 12, 1995.)

Method and System for Optimized Logistics Planning (U.S. Pat. # 5,450,317, awarded September 12, 1995, http://www.patents.ibm.com/details?pn=US05450317)

Method and System for Designing Least Cost Local Access Networks
(U.S. Patent #5,508,999, awarded April 16, 1996.)

Method and System for Planning and Installing Communication Networks.
(U.S. Patent #5,515,367, awarded May 7, 1996.)

Automated system and method for voice processing.
(U.S. Patent #5655006, awarded August 5, 1997.)

Method and system for identifying a corrupted speech message signal.
(U.S. Patent #5,684,921, awarded November 4, 1997.)

Method for providing a linguistically competent dialogue with a computerized service representative. (U.S. Patent #5,685,000, awarded November 4, 1997.)

Method and system for developing network analysis and modeling with graphical objects. (U.S. Patent #5,715,432, awarded February 3, 1998)

Adaptive knowledge base of complex information through interactive voice dialogue.
(U.S. Patent # 5,774,860, awarded June 30, 1998)

Method and system for linguistic command processing in a video server environment.
(U.S. Patent #5,832,439, awarded November 3, 1998)

Architecture and method for providing interactive broadband products and services using existing telephone plant. (U.S. Patent #5,857,142, awarded January 4, 1999.)
http://www.patentstorm.us/patents/5857142.html

Method for annotating and editing voice messages via acoustic bullet points. (U.S. Patent #5,943,402, awarded August 24th, 1999, http://www.patents.ibm.com/details?pn=US05943402)

Calendar system with direct and telephony networked voice control interface. (U.S. Patent #6,009,398, awarded December 28th, 1999,
http://www.patents.ibm.com/patlist?icnt=US&patent_number=6009398&x=27&y=11)

Method and system for designing a cellular communication system. (U.S. Patent #6,181,917, awarded January 30th, 2001, http://www.delphion.com/cgi-bin/viewpat.cmd/US06181917,
http://www.patentstorm.us/patents/6181917.html)

LOUIS ANTHONY COX, JR., PH.D.
SELECTED PUBLICATIONS

Selected Books, Reports, and Monographs

Cox L.A. and Greenberg M.R. (Eds) *Advances in Terrorism Risk Analysis*. On-Line Special Issue of *Risk Analysis: An International Journal*. Wiley. 2011. http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1539-6924/homepage/custom_copy.htm

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Cox, L.A., Jr. *Risk Analysis of Complex and Uncertain Systems*. Springer. New York. 2009. www.springer.com/business/operations+research/book/978-0-387-89013-5. Reviewed at http://interfaces.journal.informs.org/cgi/reprint/40/4/330.pdf.

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National Research Council. Committee on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis, *Department of Homeland Security Bioterrorism Risk Assessment: A Call for Change*. National Academies Press. Washington, D.C., 2008. http://www.nap.edu/catalog.php?record_id=12206#toc

National Research Council. *Safety and Security of Commercial Spent Nuclear Fuel Storage*. National Academies Press**.** Washington, D.C., 2006.

Raucher R, *et al.*, *Quantifying Public Health Risk Reduction Benefits* American Water Works Association, 2002.

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Cox, L.A., Jr., and P.F. Ricci (eds), *New Risks: Issues and Management*. Plenum Press, 1990.

Murray, C.A., and L.A. Cox, Jr., *Beyond Probation: Juvenile Corrections and the Chronic Delinquent.* Sage Publications, Beverly Hills, CA, 1979.

Encyclopedias

Wiley Encyclopedia of Operations Research and Management Science. 2011. www.wiley.com/WileyCDA/WileyTitle/productCd-0470400633.html. Area Editor for Decision Analysis, Risk Analysis, and Game Theory sections.

Wiley Encyclopedia of Quantitative Risk Analysis and Assessment, 2008 www.wiley.com//legacy/wileychi/risk/edBoardSection.html Area Editor, *Risk Management* Section.

Journal Publications, Book Chapters, Etc.

Cox LA Jr. Book Review. Poverty and Risk: A Review of *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, by Abhijit V. Banerjee and Esther Durflo. *Risk Analysis*. 2012.

Cox LA Jr. Confronting deep uncertainties in risk analysis. *Risk Analysis* 2012.

Cox LA Jr. Evaluating and improving risk formulas for allocating limited budgets to expensive risk-reduction opportunities. *Risk Analysis*. 2012.

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Cox LA Jr. Why income inequality indexes do not apply to health risks. *Risk Analysis* 2012. Feb; 32(2): 192-196

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Cox LA Jr. A causal model of chronic obstructive pulmonary disease (COPD) risk. *Risk Analysis.* 2011 Jan;31(1):38-62. (Winner, *2011 Best Paper Award*, Society for Risk Analysis) http://www.sra.org/journal_best_paper_awards.php

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Cox, L.A., Jr., L. Lu, J. Sanchez, X. Sun, "Cost savings from network optimization of DWDM facilities and optical switches". In *Proceedings of the 8th International Conference on Telecommunications Systems: Modeling and Analysis.* Vanderbilt University, Nashville, Tennessee, March 9-12, 2000.

Cox, L.A., Jr., "Predicting and optimizing customer behaviors." In *Proceedings of the 8th International Conference on Telecommunications Systems: Modeling and Analysis.* Vanderbilt University, Nashville, Tennessee, March 9-12, 2000.

Cox, L.A., Jr., "Causal mechanisms and classification trees for predicting chemical carcinogens." In David Heckerman and Joe Whittaker (editors). *Proceedings of the Seventh International Workshop on Artificial Intelligence and Statistics.* Morgan Kaufmann Publishers, Inc., San Francisco, CA, 1999. http://uncertainty99.microsoft.com/proceedings.htm

Cox, L.A., Jr., Dose-response relationships and benzene toxicology in *Proceedings of The Toxicology Forum, 22nd Annual Winter Meeting.* Toxicology Forum, Inc., 1997.

Cox, L.A., Jr., "PM 2.5 and diesel exhaust health risks: Statistical *vs.* causal associations". Proceedings of the U. California, Riverside and The California Trucking Association Conference on *Meeting the Environmental Challenge of the 21st Century*. World Truck Conference, Treasure Island Resort Hotel, Las Vegas, Nevada. May 13-15, 1997.

Cox, L.A., Jr., "Learning approximately optimal planning trees from complex multivariate data sets with the help of a causal theory", in I.H. Osman and J. Kelly (eds), *Proceedings of the Metaheuristics International Conference.* Kluwer, Norwell, MA., pp 287-294, 1995.

Cox, L.A., Jr., X. Sun, and Y. Qiu, "Optimal and heuristic search for a hidden object in one dimension." *Proceedings of the 1994 IEEE International Conference on Systems, Man, and Cybernetics. Volume 2.* San Antonio, Texas, October 2-5, 1994.

Qiu, Y., and L.A. Cox, Jr., "Optimal search for failed components in renewable coherent systems," *Proceedings of the 1994 IEEE International Conference on Systems, Man, and Cybernetics, Volume 2.* San Antonio, Texas, October 2-5, 1994.

Davis, L.D., Y. Qiu, L.A. Cox, Jr., and D. Orvosh, "A genetic algorithm for survivable network design", *Proceedings of the 5th International Conference on Genetic Algorithms.* Morgan Kaufmann, 1993.

Cox, L.A., Jr., "Heuristic approaches to dynamic path assignment," in *Proceedings of the First International Workshop on Operations Research in Telecommunications,* Boca Rotan, Florida, March, 1990.

Cox, L.A., Jr., "Designing expert classification systems that acquire expensive information optimally" in J. Boose *et al* (eds), *Proceedings of the European Knowledge Acquisition Workshop for Knowledge-Based Systems.* Gesellschaft fur Mathematik und Dataenverarbeitung MBH, GMD-Studien Nr. 143, Bonn, Germany, 1988.

Cox, L.A., and R. Blumenthal, "KRIMB: An intelligent knowledge acquisition and representation program for interactive model building," in T. Addis et al (eds), *Proceedings of the First European Workshop on Knowledge Acquisition for Knowledge-Based Systems.* Reading University Press, Reading, England, 1987.

Cox, L.A., Jr. and R. Blumenthal, "Dynamic planning under uncertainty using automated model construction and risk analysis," *Proceedings of the 1987 Workshop on Simulation and Artificial Intelligence.* Seattle, WA, 1987.

Cox, L.A., Jr., "ATAM: A personal computer modeling system for security threat assessment," *Proceedings of the 2nd Annual Symposium of Physical/Electronic Security.* Philadelphia Chapter, Armed Forces Communications and Electronics Association, Philadelphia, PA, 1986

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Cox, L.A., Jr., and M.B. Paxton, "A computer model of hematotoxicity explaining experimental and clinical data for cyclophosphamide and benzene". Invited poster presented at the SOT Poster/Discussion session on "Benzene -- Toxicity, Mechanisms, and Pharmacokinetics", Abstract #839. 36th Annual Meeting of the Society of Toxicology. Cincinnati Convention Center, March 11, 1997

Cox, L.A.., Jr. and F.B. Thomas, "A generic PBPK modeling tool for rapidly developing PBPK models," *The Toxicologist,* **12**, 1, abstract # 684, p. 188, February, 1992.

Cox, L.A., Jr., M.G. Bird, W. Lampson, and S.J. Wykoff, "An expert database management tool for biological effects of chemicals," *The Toxicologist*, **12**, 1, abstract # 1376, p. 352, February, 1992.

Cox, L.A., Jr., "Data mining and causal simulation modeling of customer behaviors". Fifth INFORMS Telecommunications Conference. March, 2000. http://www.crt.umontreal.ca/GERAD/boca2000/T00003.html

Bell G. and Cox, L.A., Jr., "Optimizing Dark Fiber Use in Metropolitan Areas", *Sixth INFORMS Telecommunications Conference*, Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox01336062645.pdf

Cox, L.A., Jr., "What is the cost of a DS3?". Invited talk, *Sixth INFORMS Telecommunications Conference*, Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox_network_cost_abstract.pdf

Babayev D. and Cox, L.A., Jr., "Least-Cost Acquisition of Service Facilities via Spatial Clustering", *Sixth INFORMS Telecommunications Conference*, Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox01356165150.pdf

Cox, L.A., Jr., "Predicting Likely Telecom Service Buyers by Mining D&B and Billing Data", *Sixth INFORMS Telecommunications Conference*, Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox01361002535.pdf

SELECTED MAJOR TECHNICAL REPORTS

1. *Following Instructions.* American Institutes for Research in the Social and Behavioral Sciences (AIR), Washington, D.C., 1980. (With A.M. Rose)

2. *Development, Application, and Evaluation of a Value-Impact Methodology for Prioritization of Reactor Safety R&D Projects.* EPRI Report RP-1810-2, Electric Power Research Institute, Palo Alto, CA, 1982. (with J. Fiksel and D.L. Richardson)

3. *Methods for Risk Analysis of the Transportation of Hazardous Materials.* Final Report to the Openbaar Lichman Rijnmond. Arthur D. Little, Inc., Cambridge, MA, 1982. (with A.S. Kalelkar and L.M. Bendixen)

4. *A Workshop on Dealing with Uncertainty in Risk Analysis.* Final Report to the Division of Policy Research and Analysis (PRA), National Science Foundation. Arthur D. Little, Inc., Cambridge, MA, 1983. (with H. Ojha, J. Fiksel)

5. *PERCO: A Model for Prioritization of Environmental Risks and Control Options at Hazardous Waste Sites.* Final Report to the Massachusetts Department of Environmental Quality Engineering (DEQE). Arthur D. Little, Cambridge, MA, 1983. (with J. Fiksel)

6. *Principles for the Use of De Minimis Concepts in Risk Regulation.* Final Report to the Division of Policy Research and Analysis (PRA), National Science Foundation. Arthur D. Little, Inc., Cambridge, MA, 1984. (with J. Fiksel, M.S. Baram, and J.R. Miyares)

7. *Analysis of Routine Occupational Risks Associated with Selected Electrical Energy Systems.* EPRI Report EA-4020, Electric Power Research Institute, Palo Alto, CA, 1985 (with A.S. Kalelkar and J. Fiksel)

8. *An Automated Threat Assessment Methodology for Security Risk Analysis.* Final Report to the U.S. Air Force Computer Security Program Office (AFCSPO). Arthur D. Little, Inc., Cambridge, MA, 1986.

9. *A Conceptual Framework for Research Planning at the Health Effects Institute.* Final Report to the Health Effects Institute (HEI), Arthur D. Little, Inc., Cambridge, MA, 1986.

10. *Predictions of Future Cancer Incidence Rates Among Nuclear Power Plant Employees.* Final Report to the American Nuclear Insurers and Mutual Atomic Energy Underwriters. Arthur D. Little, Inc., Cambridge, MA, 1987 (with J. Fiksel and G.S Young).

11. *Reassessing the Internal Doses in Humans and Animals from Inhalation of Butadiene.* Report to the Chemical Manufacturers Association. Cox Associates, Denver, CO, November, 1989.

12. *New Directions in Cancer Modeling and Risk Assessment for Benzene.* Final Report to the Western States Petroleum Association. Cox Associates, Denver, CO, July, 1990.

13. *Reassessing the Risks of Chemical Carcinogens using PBPK Models: Benzene as an Example.* Report to the American Petroleum Institute. Cox Associates, Denver, CO, December, 1990.

14. *Techniques and Methodology for Dealing with Scientific Uncertainties in Biologically-Based Risk Assessment.* Report to the Western States Petroleum Association. Cox Associates, Denver, CO, February, 1991.

15. *STEM: A Data Acquisition and Management System for Exploring Biological Effects of Chemicals.* Report to Exxon Biomedical Sciences, Inc. Cox Associates, Denver, CO, June, 1991.

16. *Deterministic Biomathematical Models for Risk Modeling.* Report to the API/WSPA Biologically-Based Risk Assessment Working Group. Cox Associates, Denver, CO, October, 1991.

17. *Uncertainty Analysis of PBPK Models.* Final Report to the American Industrial Health Council Delivered Dose Working Group. American Industrial Health Council, Washington, D.C., December, 1992.

18. *Basic Biology Review and Biomathematical Modeling of Normal Blood Cell Proliferation.* American Petroleum Institute, Washington, D.C., 1993.

19. *Managing Statistical Uncertainties in PBPK Modeling.* American Industrial Health Council (AIHC), Washington, D.C., October, 1993.

20. *A Unifying Class of Linear Compartmental Flow Models of Carcinogenesis.* Report to the American Industrial Health Council (AIHC). Cox Associates, Denver, CO, January, 1994.

21. *Internal Dose and Uncertainty Analysis of Complex Risk Models.* Report to the American Industrial Health Council (AIHC). Cox Associates, Denver, CO, January, 1994.

22. *An Exact Analysis of the Multistage Model Explaining Dose-Response Concavity.* Report to the American Industrial Health Council (AIHC). Cox Associates, Denver, CO, February, 1994.

23. *Dealing with Uncertainties in a Biologically-Based Risk Assessment Model of Cyclophosphamide-Induced Leukemogenesis.* American Petroleum Institute, Health and Environmental Science. Report # DR70. Washington, D.C. May, 1994.

24. *Data Analysis and Risk Modeling of Lung Tumor Risks from Diesel Exhaust.* Report to the Western States Petroleum Association. Cox Associates, Denver, CO, March, 1995.

25. *Comments on EPA's Proposed Decisions on Standards for Particulate Matter and Ozone.* Final Report to the Engine Manufacturers Association. Cox Associates, Denver, CO. March 8, 1997. 38 pages

26. *Technical and Policy Issues in Regulating Particulate Matter (PM) Air Pollution: An Information Primer.* Draft Report to the American Petroleum Institute. Cox Associates, Denver, CO. March 31, 1997. 50 pages

27. *U S WEST Customer Attrition Modeling: Learning to Predict Customer Attrition Risk From Data.* Final Report to U S WEST Communications. Cox Associates, Denver, CO. August 14, 1997. 36 pages + Appendices

28. *Comments On OEHHA's 1997 Draft Risk Assessment For Diesel Exhaust.* Final Report to the Engine Manufacturers Association. Cox Associates, Denver, CO. 8-20, 1997. 34 pages.

29. *A Method to More Accurately Forecast Demand for Local Loop Products.* Final Report to U S WEST Communications. Cox Associates, Denver, CO. September 5th, 1997. 24 pages.

30. *Next Optimal Product Project: Optimal Statistical Matching of Product Offers to Customer Needs.* Final Report to U S WEST Communications. Cox Associates, Denver, CO. December 29th, 1997. 20 pages + Appendices

31. *TCI Customer Acquisition and Loss Model.* Final Report to TCI. Cox Associates, Denver, CO. January 9th, 1998. 31 pages + Appendices

32. *Comments On OEHHA's February, 1998 Draft Risk Assessment For Diesel Exhaust.* Final Report to the Engine Manufacturers Association. Cox Associates, Denver, CO. April 13th, 1998. 47 pages.

33. *Demographic Clusters Predicting Perceived Service Quality: Summary. Report to TCI.* Cox Associates, Denver, CO. April 17th, 1998. 8 pages.

34. *Minimizing Monthly Lease Costs in AT&T Wireless's Denver-Area Backhaul Network: Results of a Pilot Project on Cost Reduction.* Draft Report to AT&T Wireless. Cox Associates, Denver, CO. May 18th, 1998.

35. *Switch Capacity and Resources: Technical Background for Forecasting.* Report to U S WEST Advanced Technologies. Cox Associates, Denver, CO. July 30th, 1998. 15 pages + appendices and hyperlinks

36. *A Statistical Decision Approach for Sampling Ordnance and Explosives.* Final Report to the Army U.S. Army Corps of Engineers, Huntsville, Alabama. Montgomery Watson, Inc., Salt Lake City, UT and Cox Associates, Denver, CO. September, 1998. 39 pages.

37. *Network capacity forecasting and planning process: Results of a planning workshop.* Final report to A T & T Wireless Systems, National Business Planning. Cox Associates, Denver, CO. December 30, 1998. 19 pages plus appendices.

38. *Minimizing network facility costs via DWDM overlays: Results of a pilot project on cost reduction.* Final report to Tellium. Cox Associates, Denver, CO. April 15th, 1999. 19 pages plus appendices.

39. *An Investigation of System Identification Techniques for Simulation Model Abstraction.* Final Technical Report, Air Force Research Laboratory Information Directorate. Rome Research Site. Rome, New York. February, 2000. 84 pages. (with D.A. Popken) http://www.stormingmedia.us/58/5825/A582573.html

40. *Review of Uncertainty and Variability Analysis In IRIS for Eight Substances.* Final Report to Versar. Cox Associates, Denver, CO. June 14th, 2000. 28 pages plus appendices. http://www.epa.gov/ncea/hlthfx_iris.htm

41. *Optical Network Design Tools: Optimization Software to Support Migrating to Optical Networks.* Final Report to Nortel Networks. Cox Associates, Denver, CO. July 2000. 45 pages plus appendices.

42. *A Rapid Study of Classic U S WEST Business Customer Attrition and Purchases: Results.* Final Report to Qwest Communications. Cox Associates, Denver, CO. December, 2000. 36 pages.

43. *A Dynamic Simulation Model of Campylobacter Illnesses.* Final Report to Animal Health Institute. Cox Associates, Denver, CO. February, 2001. 68 pages plus appendices.

44. *Quantifying Public Health Risk Reduction Benefits.* AWWA Research Foundation, 2002. (Raucher, R.S. *et al.*) 205 pages + appendices.

45. *Animal Antimicrobial Feed Additives and Human Health: A Guide to Risk Analysis.* Animal Health Institute and Cox Associates. February, 2003. 51 pages.

46. *Rapid, Accurate Risk Ratings of Animal Antimicrobials.* Final Report to Animal Health Institute. Cox Associates, Denver, CO. July, 2003. 54 pages.

47. *Quantitative Human Health Risks From Virginiamycin Use in Food Animals in Australia.* Final Report to Animal Health Institute. Cox Associates, Denver, CO. August, 2003. 19 pages + Appendices.

48. *Computer simulation of dynamic interactions among VOC hematotoxins in bone marrow*. Final Report to American Chemistry Council. Cox Associates, Denver, CO. September, 2003. 30 pages + Appendices.

49. *Quantitative Risk Assessment of Avilamycin Use in the US.* Draft Final Report to Elanco, Cox Associates, Denver, CO. October, 2003. 32 pages + Appendices.

50. *Human Health Risk Assessment of Macrolide Use in US Food Animals.* Draft Final Report to Elanco, Cox Associates, Denver, CO. October, 2003. 26 pages + Appendices.

51. National Academy of Sciences National Research Council report on *Safety and Security of Commercial Spent Nuclear Fuel Storage*. National Academies Press. Washington, D.C., 2006. http://www.nap.edu/openbook/0309096472/html/R4.html

52. *Risk Assessment of Penicillin/Aminopenicillin Resistance in Enterococci Due to Continued Use of Penicillins in Food Animals*. Final Report to Alpharma. Cox Associates, Denver, CO. June, 2007. 57 pages. (With Dr. Douglas Popken)

53. National Research Council. Committee on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis. *Interim Report on Methodological Improvements to the Department of Homeland Security's Biological Agent Risk Analysis*. National Academies Press**.** Washington, D.C., 2007.

54. *Risk Assessment of Lactrol™ in Distiller Grain Animal Feeds.* Final Report to Phibro Animal Health. Cox Associates, Denver, CO. October, 2009. (With Dr. Douglas Popken)

55. *Human Health Risk Assessment of Eliminating the Withdrawal Period for Chlortetracycline Feed Products in Swine*. Final Report to ADM. Cox Associates, Denver, CO. November, 2011. 30 pages. (With Dr. Douglas Popken)

LOUIS ANTHONY COX, JR., PH.D.
SELECTED TALKS, LECTURES, AND PRESENTATIONS

1. "Biological bases of low-dose nonlinearity for chemical carcinogens," invited talk presented at the Society for Risk Analysis Annual Meeting, New Orleans, Hotel Intercontinental, October 7-10, 1990.

2. "Biologically-based risk assessment," invited seminar given to the EPA and the Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina, May 22, 1991.

3. "Dealing with uncertainty in PBPK modeling," presentation to the American Industrial Health Counsel (AIHC) Delivered Dose Working Group, Washington, D.C., November 14, 1991.

4. "PBPK modeling in biologically-based risk analysis," invited talk to the Houston Chapter of the Society for Risk Analysis, Houston, TX, November 20, 1991.

5. "Why offer doctoral programs in risk analysis?", invited presentation and panel discussion at the Society for Risk Analysis Annual Meeting, Baltimore, MD, December, 1991.

6. "Challenges and promises of risk assessment," invited seminar presented to the U S Department of Agriculture's APHIS program, Hyattsville, MD, January 7, 1992.

7. "Recent advances in decision analysis," invited graduate seminar presented at the University of Colorado business school, March 18, 1992.

8. "Economic research and modeling in the telecommunications industry," invited talk given at the Public Utilities Regulatory Training Institute (PURTI) visit to U S WEST Advanced Technologies, May, 1992.

12. "New methods for calculating upper confidence bounds of multistage dose-response models," invited seminar given at the California Environmental Protection Agency, Berkeley, CA, September 4, 1992.

13. "Scientific research needs in benzene risk assessment," invited presentation and panel discussion presented at the American Petroleum Institute workshop on Mechanisms of Benzene Toxicity as a Basis for Risk Assessment, Airlie Foundation, Warrenton, VA, September 21-23, 1992.

14. "Decisions with unknown consequences: A random valuation model," presented at the Society for Risk Analysis 1992 Annual Meeting, December 6-9, Hotel del Coronado, San Diego, CA, December 6-9. 1992.

15. "Relating biologically-based risk models to population data," presented at the Society for Risk Analysis 1992 Annual Meeting, December 6-9, Hotel del Coronado, San Diego, CA, December 6-9. 1992.

16. "Incorporating biological response information into risk prediction," poster presented at the Society for Risk Analysis 1992 Annual Meeting, December 6-9, Hotel del Coronado, San Diego, CA, December 6-9. 1992.

17. "Minimizing the average costs of fault diagnosis in complex systems," poster presented at the *Fourth International Workshop on Artificial Intelligence and Statistics,* Fort Lauderdale, Florida, January 4-6, 1993.

18. "Uncertainty analysis of complex risk models: Bayesian and non-Bayesian approaches" invited seminar presented at the Harvard School of Public Health, January 26, 1993.

19. "New approaches to confidence band estimation in parametric statistical models," invited seminar presented at the Environmental Protection Agency, February 8, 1993.

20. "Statistical and artificial intelligence analysis of isoprene bioassay data", talk presented at Battelle Columbus Laboratories, September 25, 1993.

21. "Optimal project selection in a stochastic funding model", talk presented (with L. Lu and Y. Qiu) at the ORSA/TIMS Joint National Meeting, Hyatt Regency, Phoenix Arizona, October 31-November 3, 1993.

22. "A biologically-based risk assessment (BBRA) model of leukemogenesis induced by cyclophosphamide", Poster presented by Dr. Mary Paxton at the workshop on *Biological Mechanisms and Quantitative Risk Assessment: From Experimental Design to Risk Characterization.* Research Trangle Park, North Carolna, November 1-4, 1993.

23. "Coping with uncertainties in a computer simulation model of cyclophosphamide-induced leukemogenesis," invited talk, 1993 Annual Meeting of the Society for Risk Analysis, Savannah, Georgia, December 5-8, 1993.

24. "Machine learning for uncertainty management in complex risk models", invited talk presented at The Institute of Management Sciences (TIMS) and Operations Research Society of America (ORSA) joint meeting, Boston Marriott Copley Place, Boston, Massachusetts, April 24-27, 1994.

25. "Reducing the expected costs of classification trees through local search" (presented with X. Sun and Y. Qiu), invited talk, TIMS/ORSA joint meeting, Boston Marriott Copley Place, Boston, Massachusetts, April 24-27, 1994.

26. "Planning survivable interoffice networks using SPT", (coauthored with and presented by Y. Qiu), invited talk presented at TIMS/ORSA joint meeting, Boston Marriott Copley Place, Boston, Massachusetts, April 24-27, 1994.

27. "Least-cost inspecting and repairing strategies for multicomponent systems," (with X. Sun and Y. Qiu), invited talk presented at The Institute of Management Sciences (TIMS) 1994 annual conference, University of Alaska at Anchorage, June 12-15,1994.

28. "More informative confidence limits for dose-response functions using Monte-Carlo simulation: The Data Cube approach." Invited seminar presented at the California EPA, Office of Environmental Health Hazard Assessment, Berkeley, CA, August 12, 1994.

29. "New frontiers in toxicology information: Technologies of the informaion superhighway." Keynote address, *21st Annual Toxicology Information Roundtable,* MICROMEDEX Toxicology, Medicine, and Environmental Series, Westin Hotel at Tabor Center, Denver, Colorado, October 13, 1994.

30. "Nonlinear dose-time-response relations for chemical leukemogens: Computer simulation of the roles of cell kinetics and hematotoxicity." Invited talk presented at the *Symposium on Recent Developments in Benzene Epidemiology and Toxicology.* Villa Florence Hotel. San Francisco, CA. November 29-30, 1994.

31. "A simulation method for constructing more informative upper confidence limits on dose-response functions," invited talk presented at the 1994 Annual Meeting of the Society for Risk Analysis, Hyatt Regency at the Inner Harbor, Baltimore, MD, December 4-7, 1994.
http://www.riskworld.com/Abstract/1994/sraam94/ab4aa072.htm

32. "Nonlinear cell kinetics can explain observed anomalies in dose-time-response patterns," Poster session (presented with Dr. M.B. Paxton), 1994 Annual Meeting of the Society for Risk Analysis, Hyatt Regency at the Inner Harbor, Baltimore, MD, December 4-7, 1994.
http://www.riskworld.com/Abstract/1994/sraam94/ab4aa249.htm

33. "Automated visualization and discovery of predictively useful biological response profiles in complex data set" (with Dr. M. Bird), presented at the 1994 Annual Meeting of the Society for Risk Analysis, Hyatt Regency at the Inner Harbor, Baltimore, MD, December 4-7, 1994.

34. "PBPK modeling and mechanistic risk assessment: Using scientific information to improve risk assessment." Lecture given at the CACI/CDPHE Risk Assessment Workshop, Denver, CO, January 31, 1995.

35. "Reassessing benzene risks using internal doses and Monte-Carlo uncertainty analysis", invited talk presented at Benzene '95, Rutgers, New Jersey, June, 1995.

36. "Analysis of isoprene bioassay data: Risk assesment implications", invited talk presented at the International Symposium: Evaluation of Butadiene and Isoprene Health Risks", Blaine, Washington, June 27-29, 1995.

37. "Reanalyzing human lung cancer risks from diesel exhaust using a multivariate risk model", invited talk presented at the Diesel Risk Assessment Workshop, San Francisco, January 29-30, 1996.

38. "Biomathematical modeling of chemically-induced myelotoxicity and potential applications to t-AML risk modeling", invited talk presented at the University of California, Berkeley Workshop on *Modeling Chemically-Induced Leukemia -- Implications for Benzene Risk Assessment.* Yountville, CA, February 11-13, 1996. (Report by M.T. Smith and E.W. Fanning published in *Leukemia Research,* 1997.)

39. "Scheduling switch replacements with randomly decreasing deadlines", with S. Chiu and Y. Lee, presented at INFORMS 96, Washington, D.C., May 5-8, 1996.

40. "Optimal design of digital wireless networks" (with S. Chiu, J. Ryan, V. Corlew, S. Raghavan), presented by Dr. S. Chiu at IFORS Conference, Vancouver, May, 1996.

41. "A network design problem for multimedia broadband networks," presented by Dr. Cox for Dr. Y. Lee at INFORMS Spring meeting, Washington, D.C., May 5-8, 1996.

42. "Stochastic optimization in classification trees." *Fifth Society for Industrial and Applied Mathematics Conference on Optimization,* Victoria, British Columbia, May 20-22, 1996.

43. "Using data to improve business performance: Techniques and applications", invited talk given at the *Electric Power Research Institute (EPRI) 1996 Performance Measurement Workshop.* Loews Giorgio Hotel, Denver, CO. November 7, 1996.

44. "Uncertainty analysis of complex risk models," invited talk presented at the Society for Risk Analysis and International Society of Exposure Analysis, 1996 Annual Meeting, Fairmont Hotel, New Orleans, December 8-12, 1996. http://www.riskworld.com/Abstract/1996/SRAam96/ab6aa088.htm

45. "Decision models for uncertain hazards", invited talk presented at the Society for Risk Analysis and International Society of Exposure Analysis, 1996 Annual Meeting, Fairmont Hotel, New Orleans, December 8-12, 1996. http://www.riskworld.com/Abstract/1996/SRAam96/ab6aa134.htm

46. "Using classification trees to improve causal inferences in observational studies." Presented at the *Sixth International Workshop on Artificial Intelligence and Statistics.* Fort Lauderdale, Florida. January 4-7, 1997.

47. Testimony on health effects of particulate matter. Presented on behalf of the Engine Manufacturers Association at EPA's Public Hearings on Ozone and Particulate Matter National Ambient Air Quality Standards. Salt Lake City, January 14, 1997.

48. "Adaptive spatial sampling for inspection and cleanup at hazardous waste sites". Invited seminar given at AlliedSignal, Morristown, New Jersey. January 28, 1997.

49. "Dose-response relationships and benzene toxicology." Invited talk presented at the Toxicology Forum, 22nd Annual Winter Meeting. Loews L'Enfant Plaza Hotel, Washington, D.C. February 24-27, 1997.

50. "A computer model of hematotoxicity explaining experimental and clinical data for cyclophosphamide and benzene". Invited presentation, with Dr. M.B. Paxton, at the SOT Poster/Discussion session on "Benzene -- Toxicity, Mechanisms, and Pharmacokinetics", Abstract #839. 36th Annual Meeting of the Society of Toxicology. Cincinnati Convention Center, March 11, 1997.

51. "Heuristics for improved design of telecommunications networks and services". Invited lecture in graduate seminar on Advanced Topics in Optimization. University of Colorado at Boulder. April 23, 1997.

52. "Nonlinear dose-time-response models for chemical carcinogens." Invited seminar, hosted by the University of Colorado at Denver Biomathematics Seminar, Denver, Colorado. April 30, 1997.

53. "Optimal sequential inspection of complex reliability systems with uncertain structure function and component reliabilities." Invited talk, presented at the INFORMS Spring meeting, San Diego, May 4-7, 1997.

54. "An integrated business simulation model for PCS companies." Invited talk, INFORMS Spring meeting, San Diego, May 4-7, 1997. (With W. Kuehner, K. Paige, J. Parker)

55. "Optimizing PCS backhaul networks: Should wireless network engineers care?" Invited talk, presented at the INFORMS Spring meeting, San Diego, May 4-7, 1997.

56. "Optimization modeling therapy for large, disorganized companies". Invited talk, presented at the INFORMS Spring meeting, San Diego, May 4-7, 1997.

57. "PM 2.5 and diesel exhaust health risks: Statistical *vs.* causal associations". Invited talk presented at University of California, Riverside and The California Trucking Association Conference on *Meeting the Environmental Challenge of the 21st Century*. World Truck Conference, Treasure Island Resort Hotel, Las Vegas, Nevada. May 13-15, 1997.

58. "A computer model of hematotoxicity explaining experimental and clinical data." Invited seminar, hosted by the University of Colorado at Denver Biomathematics Seminar, Denver, Colorado. November 19, 1997.

59. "Adaptive spatial sampling for investigating and remediating contaminated properties." Poster session presented at the Society for Risk Analysis 1997 Annual Meeting. Capitol Hilton Hotel, Washington, D.C., December, 1997. http://www.riskworld.com/Abstract/1997/SRAam97/ab7ab384.htm

60. "Directed acyclic graph algorithms for interpreting causality in ambiguous epidemiological data". Invited seminar, hosted by the University of Colorado at Denver's Biomathematics Seminar Series, Denver, Colorado. February 7th, 1998.

61. "Applied mathematics in telecommunications consulting". Invited seminar, hosted by University of Colorado at Denver's Optimization Seminar Series. http://www-math.cudenver.edu/optima/seminars.html. February 11, 1998.

62. "Dynamic hierarchical packing minimizes costs of wireless switch capacity expansion." Invited talk presented at the 1998 INFORMS Telecommunications Conference, Sheraton Inn, Boca Rotan, Florida. March 8-11, 1998. http://www.cstp.umkc.edu/informs-telecom/4th_conf_dir/adv_prog_detail.html

63. "More accurate forecasting of demand for telecommunications products using customer information profiles and purchase transition data." Invited talk presented at the 1998 INFORMS Telecommunications Conference, Sheraton Inn, Boca Rotan, Florida. March 8-11, 1998. http://www.cstp.umkc.edu/informs-telecom/4th_conf_dir/adv_prog_detail.html

64. "Exact mathematical analysis of multistage carcinogenesis models," Invited seminar, hosted by the University of Colorado at Denver's Biomathematics Seminar Series, Denver, Colorado. April 10th, 1998.

65. "Association *vs.* causation: Notes and comments on EPA's draft risk assessment for diesel exhaust", presented to the Clean Air Science Advisory Committee (CASAC), Governor's Inn, Research Triangle Park, NC, May 5th, 1998.

66. "Advances in data mining: Case studies from the telecommunications industry." Invited lecture, University of Denver, Daniels School of Business, capstone course in data technologies for business applications, May 11th, 1998.

67. "Advances in biologically-based risk assessment". Invited seminar given at Exxon Biomedical Sciences, Inc., Mettlers Road, New Jersey. June 1, 1998.

68. "New methods for identifying quantitative structure-activity and activity-activity relations." Invited seminar given at Exxon Biomedical Sciences, Inc., Mettlers Road, New Jersey. June 1, 1998.

69. "Simulation-optimization heuristics for sampling contaminated soils." Invited presentation, Biomathematics and Statistics Seminar, University of Colorado at Denver Mathematics Department. September 24, 1998.

70. "Identifying customer demand processes from data." Presentation given (with Dr. Douglas Popken) at INFORMS 98, Seattle Convention Center, October 26th, 1998.

71. "Optimal statistical sampling of contaminated soils." Invited lecture, Seminar in Advanced Topics in Optimization, U. of Colorado at Boulder, December 2nd, 1998

72. "Computational Bayesian methods for assessing uncertain exposures." Lecture in the 1998 Workshop on *Probabilistic Methods in Risk Assessment.* Society for Risk Analysis Annual Meeting, Phoenix, Arizona. December 6th, 1998.

73. "Axiomatic Definitions of Risk". Poster presented at Society for Risk Analysis Annual Meeting, Phoenix, Arizona. December 9th, 1998. http://www.sra.org/events.htm#annual

74. "A simulation-optimization approach to cost-effective sampling and cleanup of contaminated areas." Talk presented at the Society for Risk Analysis 1998 Annual Meeting, Phoenix, Arizona. December 9th, 1998. http://www.sra.org/events.htm#annual

75. "A biologically motivated model of hematotoxicity: Model overview and empirical evaluation." Presented at the *Hematotoxicity Modeling Workshop,* Institute of Population Health, University of Ottowa. December 15th, 1998.

76. "Causal mechanisms and classification trees for predicting chemical carcinogens." Presented (by Professor D. Fisher for L.A. Cox) at the *Seventh International Workshop on Artificial Intelligence and Statistics.* Fort Lauderdale, Florida. January 3-6, 1999. http://uncertainty99.microsoft.com/proceedings.htm

77. "Applied mathematics in telecommunications consulting." Invited lecture in Undergraduate Mathematics Seminar, University of Colorado at Denver, March 8th, 1999. http://www.cudenver.edu/~hgreenbe/courses/3001/S99/syllabus.html

78. "Causal data mining and modeling of customer data." Invited lecture, University of Denver, Daniels School of Business, capstone course in data technologies for business applications, April 29th, 1999.

79. "Optimal use of acquired network facilities." Invited presentation, INFORMS '99, Cincinnati Convention Center, May 3rd, 1999.

80. "Valid and invalid causal inferences in epidemiology." Invited talk, CU-Denver Statistics and BioMath Seminar, September 14th, 1999.

81. "An axiomatic approach to attributable risk," CU-Denver Statistics and BioMath Seminar, October 19th, 1999.

82. "Forecasting purchases of telecommunications services via state transition models", with Dr. Doug Popken. INFORMS Fall '99, Philadelphia, November 7-10, 1999. http://www.informs.org/Conf/Philadelphia99//TALKS/TE13.html

83. "Causal data mining of telecommunications customer data", INFORMS Fall '99, Philadelphia, November 7-10, 1999. http://www.informs.org/Conf/Philadelphia99//TALKS/TE13.html

84. "Mathematical validity of CVM Risk Assessment." Invited review of antimicrobial risk assessment, presented at U.S. Food and Drug Administration Center for Veterinary Medicine (CVM)'s Draft Risk Assessment and the Establishment of Resistance Thresholds Workshop, December 9th and 10th, 1999. DoubleTree Hotel, Rockville, MD. http://www.fda.gov/cvm/mathval_tcox.htm

85. "Optical network planning and optimization in metropolitan areas." Invited talk at Institute for International Research Conference on *Transitioning to the Next Generation Metropolitan Network Using DWDM.* Wyndham Miami Beach Resort, February 14-15, 2000.

86. "Data mining and causal simulation modeling of customer behaviors". Tutorial presented at Fifth INFORMS Telecommunications Conference. Sheraton Boca Raton Hotel, Boca Raton, Florida, March 5-8, 2000. http://www.crt.umontreal.ca/GERAD/boca2000/monday.shtml#ma

87. "Cost savings from network optimization of DWDM facilities and optical switches". Presented at *8th International Conference on Telecommunications Systems: Modeling and Analysis.* Vanderbilt University, Nashville, Tennessee, March 9-12, 2000.

88. "Predicting and optimizing customer behaviors." Presented at *8th International Conference on Telecommunications Systems: Modeling and Analysis.* Vanderbilt University, Nashville, Tennessee, March 9-12, 2000.

89. "Attributable risk and multiple causes." Invited seminar, University of Colorado Health Sciences Center Seminar Series, April 17th, 2000

90. "Predicting how Telecommunications Ads Affect Customer Values". INFORMS Spring 2000 Meeting, Salt Lake City, Utah, May 7-10, 2000. Salt Palace Convention Center. http://www.informs.org/Conf/SaltLake2000//TALKS/MB19.html

91. "A simulation model of excess illnesses from fluoroquinolone-resistant Campylobacter." Invited presentation, 9th Symposium of the International Society

for Veterinary Epidemiology and Economics. Beaver Run Resort, Breckenridge, CO, August 6-11, 2000.
http://www.cvmbs.colostate.edu/cveadss/schedule/SchedulePage.htm

92. "Some new problems in applied optimization: Telecommunications data mining and network design applications.". Invited lecture, Seminar in Special Topics in Optimization, University of Colorado at Boulder, School of Business, November 2nd, 2000.

93. "Designing Effective Risk Management Decision Processes" (with V. Bier). Invited talk, INFORMS Annual Meeting, San Antonio, November, 2000. (Presented by Professor Bier.)

94. "A discrete-event simulation model of human health risks from fluoroquinolone-resistant Campylobacter in chickens." Society for Risk Analysis Annual Meeting, Washington D.C. December 6th, 2000.

95. "Alternatives to establishing thresholds: A predictive modeling framework." Invited talk presented at the FDA meeting on Use of Antimicrobial Drugs in Food Animal and the Establishment of Regulatory Thresholds on Antimicrobial Resistance. Rockville, MD, January 22 - 24, 2001.
http://www.fda.gov/cvm/antimicrobial/thresagenda51.htm

96. "Advances in data mining for predicting risks of customer responses to interventions." Invited lecture, Hearin Center for Enterprise Science. University of Mississipi School of Business Administration, Oxford, Mississipi, 2-24-01.

97. "Data mining methods for health risk data bases." Invited lecture, Seminar on Computational Biology, University of Colorado Department of Mathematics, Denver, Colorado, 3-15-01.

98. "Optimized mesh vs. ring comparisons". Invited presentation and panel discussion, All Optical Network Conference, Orlando, Florida, May 3rd, 2001.

99. "Campylobacter risk analysis: a cause-and-effect view." Invited presentation, *Second International Conference on Antimicrobial Resistance: Use of Antimicrobials and Protection of Public Health.* Office International des Epizooties, Paris, France. 2-4 October, 2001.

100. "Decision-making with incomplete models". Invited lecture, Seminar in Special Topics in Optimization, University of Colorado at Boulder, School of Business, November 28th, 2001.

101. "Game theoretic models of critical infrastructure protection" Society for Risk Analysis Annual Meeting, Seattle, WA, December 5th, 2001. (Bier, V., Abhichandani, V., Cox, L.A., Jr. Presented by Professor V. Bier.)

102. "The Causes of Campylobacteriosis". Invited paper presented at *Symposium on the Use of Fluoroquinolones in Poultry: Effect on Campylobacter and the Potential Human Health Consequences.* Cambridge, MA, March 1, 2002.

103. "Optimizing Dark Fiber Use in Metropolitan Areas" (with G. Bell), *Sixth INFORMS Telecommunications Conference,* Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox01336062645.pdf

104. "What is the cost of a DS3?" . Invited talk, *Sixth INFORMS Telecommunications Conference,* Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox_network_cost_abstract.pdf

105. "Least-Cost Acquisition of Service Facilities Via Spatial Clustering" (with D. Babayev), *Sixth INFORMS Telecommunications Conference,* Boca-Raton, Florida, March 10-13, 2002. http://www.informs.org/Conf/Telecom02/Abstracts/Cox01356165150.pdf

106. "Predicting Likely Telecom Service Buyers by Mining D&B and Billing Data", *Sixth INFORMS Telecommunications Conference,* Boca-Raton, Florida, March 10-13, 2002 http://www.informs.org/Conf/Telecom02/Abstracts/Cox01361002535.pdf

107. "How to Make Good Risk Management Decisions with Inadequate Data: Applications to Blood Supply Safety." Invited talk, *Decision-Making Under Conditions of Uncertainty Regarding Rare and Emerging Diseases, with special focus on the Human Impact of Transmissible Spongiform Encephalopathy (TSE),* Fairmont Chateau Laurier Hotel. Ottawa, Ontario. March 25th and 26th, 2002. http://www.hc-sc.gc.ca/pphb-dgspsp/hcai-iamss/sra-ser/tse-est02/pdf/proceedings_dmucu_%202002.pdf

108. "Using Epidemiological Data in Risk Assessment". Lecture in Professional Course on Probabilistic Risk Assessment. Health Canada. Ottawa, Ontario. March 27th, 2002.

109. "Integrating Health Risk Assessment and Management". Lecture in Professional Course on Probabilistic Risk Assessment. Health Canada. Ottawa, Ontario. March 27th, 2002.

110. "Causes of Camplyobacteriosis", invited talk at the University of Colorado Health Sciences Center, Denver, Colorado. April 9th, 2002.

111. "Human Health Risk Assessment for Virginamycin Use in Chicken" (with D. Popken), Poster Presentation P11 at *2002 Conference on Antimicrobial Resistance.* Hyatt Regency Bethesda, Bethesda, MD, June 27th-29th, 2002. http://www.nfid.org/conferences/resistance02/absposter.pdf

112. "Causes of Fluoroquinolone-Resistant Campylobacteriosis" (with D. Popken), Poster Presentation P12 at *2002 Conference on Antimicrobial Resistance.* Hyatt Regency Bethesda, Bethesda, MD, June 27th-29th, 2002.

http://www.nfid.org/conferences/resistance02/absposter.pdf

113. "Quantifying Human Health Impacts of Veterinary Medical Products Regulations." Invited Plenary Presentation. VICH 2. Tokyo, Japan, October 10th, 2002.

114. "Defending Networked Resources Against Intelligent Attacks." Invited presentation, INFORMS Annual Meeting, San Jose. November 17-20, 2002. http://informs.emeetingsonline.com/emeetings/formbuilder/clustersessiondtl.asp?csnno=311&mmnno=101

115. "Modeling the Human Health Risks from Antibiotic Use in Chickens". Presented at INFORMS Annual Meeting, San Jose. November 17-20, 2002. http://informs.emeetingsonline.com/emeetings/formbuilder/clusterpaperdisplay.asp?ppnno=1257

116. "Quantifying human health impacts of antimicrobial risk management alternatives for enrofloxacin". Winner, Society for Risk Analysis Best Paper Award,. Society for Risk Analysis Annual Conference, New Orleans, LA. December 9-11, 2002. www.sra.org/news0203.pdf

117. "Quantifying human health risks from virginiamycin used in chickens." Poster Presentation, Society for Risk Analysis Annual Conference, New Orleans, LA. December 9-11, 2002.

118. "Uncertainty in quantitative estimates of health risk from diesel particles". Invited plenary talk, Sixth Workshop on Mexico City Air Quality, Hotel Royal Pedregal, México January 21, 2003.

119. "Communicating risks and uncertainties to health managers." Invited talk, Advanced Risk Management Techniques, Strategies, and Modelling Practices: Blood Safety. Statistics and Risk Assessment Section, Blood Safety Surveillance and Health Care Acquired Infections Division. Centre for Infectious Disease Prevention and Control. Population and Public Health Branch. Health Canada. Fairmont Chateau Laurier Hotel. March 13th-14th, 2003.

120. "Nonlinear Low-Dose Hematotoxicity" presented at *Non-Linear Dose-Response Relationships in Biology, Toxicology, and Medicine: An International Conference.* (University of Massachusetts, Amherst, MA, May 28-30th, 2003) http://www.belleonline.com/abstracts/session6.html

121. "Human Health Risks and Benefits of Current Enrofloxacin Use Patterns and Alternatives" (with Dr. Douglas Popken). Poster presented at the *NFID 2003 Annual Conference on Antimicrobial Resistance.* June 23-25th, Hyatt Regency Bethesda, MD, 2003. http://www.nfid.org/conferences/resistance03/.

122. "Quantifying Human Health Impacts of Antimicrobials Used in Veterinary and Human Medicine." Poster presented at the *NFID 2003 Annual Conference on Antimicrobial Resistance*. June 23-25th, Hyatt Regency Bethesda, MD, 2003. http://www.nfid.org/conferences/resistance03/.

123. "The role of risk assessment in assessing the future of antimicrobials in food animal production: an overview." Invited presentation, *Seventh DISCOVER Conference on Food Animal Agriculture: Is There a Future for Antibiotics in Animal Agriculture?* September 21-24, 2003. Abe Martin Lodge, Brown County State Park. Nashville, Indiana http://www.adsa.org/discover/7thDISCOVERProg4-8-03.htm

124. Cox, LA. A Computer Simulation Model of Low-Dose Interactions Among VOC Hematotoxins In Bone Marrow. Presented at Society for Risk Analysis Annual Meeting. Baltimore. December 7-10, 2003.

125. Cox LA., Popken DA. Past and Future Human Health Risks and Benefits from Animal Antimicrobials. Presented at Society for Risk Analysis Annual Meeting. Baltimore. December 7-10, 2003.

126. Cox LA. Quantitative and Qualitative Prediction of Human Health Risks from Emerging Resistance to Animal Antimicrobials . Presented at Society for Risk Analysis Annual Meeting. Baltimore. December 7-10, 2003.

127. Cox LA. Information Theory, Causality, and Objective Hazard Identification . Presented at Society for Risk Analysis Annual Meeting. Baltimore. December 7-10, 2003.

128. Cox LA. Risk Analysis Ideas for Decontaminating Buildings. Invited presentation, NRC Workshop on Standards and Policies for Decontaminating Public Facilities Affected by Exposure to Harmful Biological Agents. Hotel Monaco, Washington, D.C., January 28-29, 2004.

129. Cox, LA. Does the use of antibiotics in food animals pose a risk to human health? A critical review of published data. NARMS Conference. Decatur, Georgia. March 5, 2004.

130. Cox LA. The use of risk assessment models in formulating regulations for antibiotic use in food animal production. 53rd Western Poultry Disease Conference March 7-9, 2004 Capitol Plaza Holiday Inn - Sacramento, California

131. Cox LA. Simulating bone marrow impacts of VOC mixtures. Invited poster presented at the American Chemistry Council's LRI Annual Science Meeting. May 5-6, 2004 Hotel Inter-Continental Miami, Florida

132. Cox LA. Rapid Risk Rating Technique for risk-benefit assessments of antibiotics used in food animals. Invited presentation, ASM General Meeting New Orleans, Louisiana, May, 2004.

133. Cox LA. Detecting causal non linear exposure-response relations in epidemiological data. Poster presented at *Non-Linear Dose-Response Relationships in Biology, Toxicology, and Medicine: An International Conference.* University of Massachusetts, Amherst, MA. June 8-10, 2004.

134. Cox LA. Low-dose nonlinearity of hematopoietic dose-response relations. Poster presented at *Non-Linear Dose-Response Relationships in Biology, Toxicology, and Medicine: An International Conference.* University of Massachusetts, Amherst, MA. June 8-10, 2004.

135. Cox LA. Universality of J-shaped and U-shaped dose-response relations in stochastic transition systems. Talk presented at *Non-Linear Dose-Response Relationships in Biology, Toxicology, and Medicine: An International Conference.* University of Massachusetts, Amherst, MA. June 8-10, 2004.

136. Cox LA. Qualitative vs. Quantitative Risk Assessment of Animal Antimicrobials. Poster presented at the *NFID 2004 Annual Conference on Antimicrobial Resistance.* June 28th, Hyatt Regency Bethesda, MD, 2004. http://www.nfid.org/conferences/resistance04/.http://www.nfid.org/conferences/resistance04/.

137. Cox LA. A Rapid Risk Rating Technique (RRRT) for Quantitative Risk Assessment of Animal Antimicrobials. Poster presented at the *NFID 2004 Annual Conference on Antimicrobial Resistance.* June 28th, Hyatt Regency Bethesda, MD, 2004. http://www.nfid.org/conferences/resistance04/.http://www.nfid.org/conferences/resistance04/.

138. Quantitative comparison of human health risks and benefits caused by alternative decisions on animal drug uses. Invited talk at Society for Risk Analysis Symposium: *Risk Assessment and Antimicrobial Resistance: Past, Present and Future*. Hyatt Regency Crystal City, Arlington, VA. September 28-29, 2004. http://www.sra.org/docs/amr-ra_flyer.pdf

139. Cox LA Jr, Babayev D. Stochastic Optimization Via Random Sampling and Deterministic Solutions. Presented at INFORMS 2004 Annual Meeting. Denver, CO. October, 2004.

140. Popken DA, Cox LA Jr. Results from Simulation-Based Planning of Theatre Air Warfare. Presented at INFORMS 2004 Annual Meeting. Denver, CO. October, 2004.

141. Cox LA Jr. Potential human health benefits of antibiotics used in food animals: a case study of virginiamycin. Poster presented at the Society for Risk Analysis

Annual Meeting. Wydham Palm Springs. Palm Springs, CA. December 5-8, 2004. http://birenheide.com/sra/2004AM/program/singlesession.php3?sessid=P3

142. Cox LA, Jr., G. Charnley, C.L. Gaworski. Linear vs. Nonlinear Models of Excess Lung Cancer Risks Induced by Carbon Filter Particles in Cigarette Smoke. Poster presented at the Society for Risk Analysis Annual Meeting. Wydham Palm Springs. Palm Springs, CA. December 5-8, 2004. http://birenheide.com/sra/2004AM/program/singlesession.php3?sessid=P3

143. Cox, LA Jr. Emergent, Robust Non-Linearity of Dose-Response Relations in Stochastic Transition Models. Invited presentation at the Society for Risk Analysis (SRA) Annual Meeting. Wyndham Palm Springs. Palm Springs, CA. December 5-8, 2004. http://birenheide.com/sra/2004AM/program/singlesession.php3?sessid=P3

144. Cox, LA Jr. BSE Update. Invited presentation, R-CALF Annual National Convention. January 19, 2005 Red Lion Hotel, Denver CO. http://www.lmaweb.com/infonewspast.html , http://www.hpj.com/bsetimeline.cfm

145. Cox, LA Jr. Potential human health impacts of banning antibiotics used in food animals: A case study of virginiamycin. Invited talk, Conference on: Worldwide Ban on Animal Antibiotics on the Horizon? Amsterdam. January 31, 2005.

146. Cox, LA Jr. Quantifying potential human health risks and benefits of animal antibiotics. FDA, Center for Veterinary Medicine (CVM) FASS Symposium, Food Safety, Animal Drugs, and Animal Health Committee. Rockville, MD. February 14th, 2005.

147. Cox, LA Jr. Causal modeling in health risk analysis: Designing safer cigarettes and other applications. Invited talk, Seminar in Special Topics in Optimization, University of Colorado at Boulder, School of Business. 3-16-2005.

148. Cox, LA Jr. Low-dose dose-response nonlinearities as adaptive inventory control risk management strategies for tissues. Invited presentation at the *Fourth Annual International Conference on Hormesis: Implications for Toxicology, Medicine, and Risk Assessment.* University of Massachusetts at Amherst. Amherst, MA, June 8, 2005. http://belleonline.com/BellePrelim_2005.pdf

149. Cox, LA Jr. Complex low-dose nonlinearities: Insights from cadmium. Poster presented at the *Fourth Annual International Conference on Hormesis: Implications for Toxicology, Medicine, and Risk Assessment.* University of Massachusetts at Amherst. Amherst, MA, June 8, 2005. http://belleonline.com/BellePrelim_2005.pdf

150. Cox, LA Jr. Dynamics of u-shaped and n-shaped dose-response in a simple model of cytotoxicity-mediated carcinogenesis. Poster presented at the *Fourth Annual International Conference on Hormesis: Implications for Toxicology,*

Medicine, and Risk Assessment. University of Massachusetts at Amherst. Amherst, MA, June 8, 2005. http://belleonline.com/BellePrelim_2005.pdf

151. Cox LA Jr., Approaches to Antimicrobial Risk Analysis in Food Safety Decision Making in Poultry Medicine. Invited talk, 2005 AAAP/AVMA Annual Meeting. Minneapolis Convention Center. July 17th, 2005. http://www.aaap.info/annlmtg/m2005/Symposium%20AAAP%202005.pdf

152. Cox LA Jr., Modeling Lung Carcinogenesis 1: Genotoxic and epigenetic events in two-stage clonal expansion (TSCE) models. Invited presentation, Philip Morris Research Laboratories Symposium on Genotoxic and Epigenetic Tumorigenesis. Crown Plaza Hotel. Cologne, Germany. November 14-16, 2005

153. Cox LA Jr., Modeling Lung Carcinogenesis 2 : Toward a biologically based model of smoking and lung cancer . Invited presentation, Philip Morris Research Laboratories Symposium on Genotoxic and Epigenetic Tomorigenesis. Crown Plaza Hotel. Cologne, Germany. November 14-16, 2005

154. Cox LA Jr., Food Animal Antibiotics and Human Health. Invited seminar, Sponsored by Seed Science Center/Institute for Food Science & Security. Iowa State University. November 30th, 2005.

155. Cox LA Jr., Assessing and Managing the Human Health Risks from Antibiotics Used in Food Animals: Data, Analysis, and Policy Perspectives. Invited presentation at Iowa State University. December 1, 2005.

156. Cox LA Jr., Food Animal Antibiotics and Human Health: History and Policy Perspectives. Invited presentation at the *Society for Risk Analysis (SRA) 2005 Annual Meeting*. Orlando, Florida. December 4-7th, 2005. http://birenheide.com/sra/2005AM/program/singlesession.php3?sessid=M19

157. Cox LA Jr., What Fraction of Disease Can be Prevented by Removing Specific Exposures? Presentation at the *Society for Risk Analysis (SRA) 2005 Annual Meeting.* Orlando, Florida. December 4-7th, 2005. http://birenheide.com/sra/2005AM/program/singlesession.php3?sessid=M4

158. Cox, Tony. Risk analysis and public health – How to get from good intentions to good results: Animal antibiotics and other examples. Invited talk, *Café Scientifique.* Denver Colorado. January 17th, 2006. http://cafescicolorado.org/Cox.htm#topic

159. Cox LA Jr., Using data mining to predict and to influence customer behaviors: Some real-world examples. Invited talk, Seminar in Information Systems and Data Mining, University of Colorado at Boulder, Leeds School of Business. 2-7-2006.

160. Cox LA, Popken DA, Carnevale R. Quantitative risk anlysis for animal antibiotics. *Edelman Award Competition. INFORMS Practitioners Meeting.* Hotel Intercontinental, Miami, Florida. May 1, 2006. http://iol-a.informs.org/index.php?c=401&kat=Franz+Edelman+Award

161. Cox LA Jr.. Assessing uncertainty in influential risk assessments. Invited talk, *Public Forum on OMB's Proposed Risk Assessment Bulletin: Implications for Practice Inside and Outside Government.* George Washington University Cafritz Conference Center. Washington D.C. May 24, 2006. http://www.ramas.com/omb1.htm

162. Cox LA Jr. Meta-hormesis for uncertain risks: Arsenic as a case study. Invited presentation and panel discussion. *Fifth Annual International Conference on Hormesis: Implications for Toxicology, Medicine, and Risk Assessment.* University of Massachusetts at Amherst. Amherst, MA, June 7, 2006. http://www.hormesissociety.org/pdf/2006_Hormesis_Preliminary.pdf

163. Cox, Tony. Assessing Construction Defect Risks. *INFORMS 2006 Annual Meeting.* Pittsburgh, Wednesday Nov 08. https://informs.emeetingsonline.com/emeetings/websitepapersv2.asp

164. Cox LA Jr. Hormesis dynamics in a model of lung field cancerization. *Society for Risk Analysis 2006 Annual Meeting.* Baltimore MD Harbor Renaissance Hotel. December 3-6, 2006. http://birenheide.com/sra/2006AM/program/singlesession.php3?sessid=T3-B

165. Cox LA Jr. Uncertainty, variability and transparency in OMB's Bulletin on Risk Analysis. Invited presentation and panel discussion. *Society for Risk Analysis 2006 Annual Meeting.* Baltimore MD Harbor Renaissance Hotel. December 6, 2006.

166. Cox, Tony. Simulation of lung carcinogenesis: Some challenges for parameter optimization. Invited talk, School of Engineering, University of Colorado. 2-21-2007.

167. Cox, Tony. Is the A/J Mouse an Appropriate Model for Human COPD Risks? Invited panel discussion. Philip Morris Research Seminar on *The A/J Mouse – A Relevant Animal Model for Cigarette Smoke-Induced Diseases?* Hyatt Hotel. Cologne, Germany. May 29-30, 2007.

168. Cox LA Jr. Hierarchical, knowledge-based, and approximate models can aid prediction, assessment and communication of the lung cancer risks associated with smoking. Invited presentation, *Society for Risk Analysis – Europe. Sixteenth Annual Meeting.* The Hague, Amsterdam. June 17-19, 2007. http://www.sraeurope2007.eu/docs/ConferenceBookofAbstracts.pdf

169. Cox, Tony. Quantifying Potential Human Health Risks from Penicillin/Ampicillin Use in Food Animals. Presentation at the U.S. FDA Center for Veterinary Medicine (CVM). Rockville, Maryland. August 29, 2007.

170. Cox, Tony. Dynamic Simulation of COPD: Neutrophil Accumulation. Invited presentation. Philip Morris International, Research. Neuchatel, Switzerland. September 6, 2007.

171. Cox, Tony. Dynamic Simulation of COPD: Protease-Antiprotease Imbalance. Invited presentation. Philip Morris International, Research. Neuchatel, Switzerland. September 6, 2007.

172. Cox, Tony. Simulating lung cancer risk from conventional and modified cigarettes. Invited presentation at UCDHSC Department of Mathematical Sciences: Operations Research Seminar. December 05, 2007

173. Cox, Tony; Popken, Douglas A; Mathers, Jerry. Do penicillin-based drugs administered to food animals threaten human health? *Society for Risk Analysis 2007 Annual Meeting.* San Antonio, Texas. December 9-12, 2007. http://birenheide.com/sra/2007AM/program/

174. Cox, Tony. Identifiability and prediction uncertainty in a multistage clonal expansion (MSCE) model of carcinogenesis. Invited presentation, *Society for Risk Analysis 2007 Annual Meeting.* San Antonio, Texas. December 9-12, 2007. http://birenheide.com/sra/2007AM/program/

175. Cox, Tony; Urban, Hans-Joerg.. Multilevel biologically-based dose-response modeling of complex diseases: Lung cancer and COPD as examples. *Society for Risk Analysis 2007 Annual Meeting.* San Antonio, Texas. December 9-12, 2007. http://birenheide.com/sra/2007AM/program/

176. Cox, Tony. BSE Risk in the US: Update. Invited presentation, *R-CALF Annual Convention*, Omaha, NE. February 21, 2008. www.r-calfusa.com/convention/2008convention.htm

177. Cox, Tony. Data mining and modeling to maximize customer lifetime value. Invited lecture in Business Intelligence, Leeds School of Business, University of Colorado at Boulder. April 23, 2008.

178. Cox, Tony. Hormesis without cell killing in a competing-risks model of carcinogenesis. Presentation at *Dose-Response 2008.* University of Massachusetts at Amherst. April 30, 2008. http://www.dose-response.org/conference/2008/Conference_Program_2008.pdf.

179. Cox, Louis A. How can statisticians help improve the quality of construction defect litigation? Invited presentation, *Joint Statistical Meetings (JSM) 2008*. Denver, Colorado. August 5, 2008.

www.amstat.org/meetings/jsm/2008/onlineprogram/index.cfm?fuseaction=abstract_details&abstractid=301900

180. Cox, Tony. Improving RAMCAP™ and TVC Terrorism Risk Analysis. Invited presentation, *Chief of Naval Operations' Distinguished Fellow Program: Critical Infrastructure Workshop.* Naval Postgraduate School. Monterey , CA. August 14, 2008.

181. Cox, Tony. Short Course on Causality and Decision Analysis for Risk Analysts. *Australia & New Zealand Regional Organisation of the Society for Risk Analysis. 3rd Annual Conference.* Canberra, Australia. September 29, 2008. http://www.acera.unimelb.edu.au/sra/SRA2008/Abstract-program.pdf

182. Cox, Tony. Some limitations of "Risk = Threat x Vulnerability x Consequence" for risk analysis of terrorist attacks. *Australia & New Zealand Regional Organisation of the Society for Risk Analysis. 3rd Annual Conference.* Canberra, Australia. September 30, 2008. http://www.acera.unimelb.edu.au/sra/SRA2008/Abstract-program.pdf

183. Cox, Tony. Some limitations of elicited probabilities for terrorism risk assessment. *Australia & New Zealand Regional Organisation of the Society for Risk Analysis. 3rd Annual Conference.* Canberra, Australia. October 1, 2008. http://www.acera.unimelb.edu.au/sra/SRA2008/Abstract-program.pdf

184. Cox Louis A Jr. Game theory models of telecommunications networks resilient against terrorist attacks. *INFORMS Annual Meeting 2008* Washington, DC. October 13, 2008 https://informs.emeetingsonline.com/emeetings/formbuilder/clustersessiondtl.asp?csnno=8108&mmnno=176&ppnno=33560

185. Cox Louis A Jr. Predicting and controlling customer churn on multiple time scales. *INFORMS Annual Meeting 2008* Washington, DC. October 14, 2008 https://informs.emeetingsonline.com/emeetings/websitepapersv2.asp

186. Cox Louis A Jr. Designing networks to withstand terrorist attacks. Invited presentation, *Society for Risk Analysis 2008 Annual Meeting.* Westin Boston Waterfront Hotel. Boston, MA. December 7-10, 2008. http://www.sra.org/docs/Final_Binder_1.pdf

187. Cox Louis A Jr. Risk management prority rankings are ineffective: A call for change. *INFORMS Roundtable Winter Meeting.* Hyatt Regency San Antonio, Texas. February 22-23, 2009 www.informs.org/site/roundtable/index.php?c=17&kat=Meetings&&p=6|

188. Cox, Tony. Rethinking risk analysis: Outsmarting adaptive attackers. Invited tutorial. *Military Operations Research Society (MORS) Workshop: Risk-Informed*

Decision-Making for Homeland Security Allocation. ANSER Conference Center. Shirlington, VA. April 13, 2009. http://www.mors.org/risk/agenda.pdf

189. Cox, Tony. Risk analysis: Traditional and current approaches. Invited presentation. *Military Operations Research Society (MORS) Workshop: Risk-Informed Decision-Making for Homeland Security Allocation.* ANSER Conference Center. Shirlington, VA. April 14, 2009. http://www.mors.org/risk/agenda.pdf

190. Cox, Tony. Fixing broken risk management processes. Invited presentation. *INFORMS Practitioners Meeting*, Phoenix Sheraton, Phoenix, Arizona, April 27, *2009.* http://meetings.informs.org/Practice09/risk.html

191. Cox, Tony. Customer data mining, modeling, and optimization of lifetime value. Invited lecture in Business Intelligence, Leeds School of Business, University of Colorado at Boulder. April 28, 2009.

192. Cox, Tony. Theories and realities of risk modeling. Invited presentation to the *Committee to Review the Department of Homeland Security's Approach to Risk Analysis*. National Academy of Sciences, Washington, D.C. May 21, 2009.

193. Cox, Anthony. Health risk assessment and modeling. Invited keynote address, *Quality Risk Management – Implementation Strategies. A Joint FDA/CDER and URI College of Pharmacy Conference.* Hyatt Regency, Bethesda MD. June 15-16, 2009.

194. Cox, Louis A. What's wrong with hazard-ranking systems? Invited presentation, Section on Statistics in Defense and National Security 2009 Joint Statistical Meeting. August 5, 2009. Washington, D.C. http://www.amstat.org/meetings/jsm/2009/onlineprogram/index.cfm?fuseaction=abstract_details&abstractid=302910

195. Cox, Tony. Using risk analysis models to improve decisions: From good intentions to good results. Invited talk, Rocky Mountain INFORMS Kickoff Meeting. Tivoli Student Union Building, Denver, CO. September 24, 2009. http://www-math.cudenver.edu/events/QueryEvent.php?eid=650

196. Cox, Tony. Advances in health risk assessment and modeling. Four invited lectures presented at Risk Assessment Unit at Evira (Finnish Food Safety Authority) Helsinki. October 22-23, 2009. http://www.evira.fi/attachments/programras2009__2_.pdf

196. Cox, Tony. Quantifying potential human health risks from tetracycline use in food animals. Invited talk presented at FDA Center for Veterinary Medicine. November 12, 2009.

197. Cox, Tony. Use of mode-of-action in risk assessment. Invited presentation, *Society for Risk Analysis 2009 Annual Meeting.* Baltimore. December 7, 2009.

http://birenheide.com/sra/2009AM/program/singlesession.php3?sessid=M4-C&order=1#1 .

198. Cox, Tony. Validating Tox 21C Testing. Invited panel presentation. *21st Century Validation Strategies for 21st Century Tools***.** July 14, 2010 Baltimore, MD. http://caat.jhsph.edu/programs/workshops/july13validation.htm

199. Cox, L. Anthony, Jr. Limits of Predictability. Invited presentation to National Academy of Sciences, Committee on Mathematical Foundation of Verification, Validation, and Uncertainty Quantification. Keck Building, Washington D.C. August 24, 2020. http://www8.nationalacademies.org/cp/meetingview.aspx?MeetingId=4478

200. Cox, Tony. Decisions Without Consequence Probabilities. Invited presentation to OPTTEK. Boulder, Co. September 7, 2010.

201. Cox, Tony. Making Sustainability More Sustainable in a Risky World. *INFORMS Annual Meeting 2010.* Austin, TX. November 9, 2010. http://meetings2.informs.org/Conf/Austin2010/images/split%20pdfs/tracks/Austin%20Service%20Science%20Sections.pdf

202. Cox, Tony. Creating Customer Satisfaction: A Causal Engineering Approach. Invited Keynote Address. C5 Fall Meeting. The Cable Center. Denver, CO. November 15, 2010.

203. Cox, Tony. Models and Mechanisms of Dose-Response Thresholds for Particulate and Nanoparticle-Induced Inflammatory Lung Diseases and Lung Cancer. *Society for Risk Analysis 2010 Annual Meeting.* Salt Lake City. December 7, 2010. http://birenheide.com/sra/2010AM/program/singlesession.php3?sessid=T2-G

204. Cox, Tony. MSHA's Draft Quantitative Risk Assessment (QRA) of RCMD: Current flaws and possible fixes. Presentation at Mine Safety and Health (MSHA) Public Hearing. Arlingon, VA. 2-15-2011. http://www.msha.gov/REGS/Comments/2010-25249/Transcripts/20110215ArlingtonVA.pdf pp 77-104 and cf p. 243

205. Cox, Tony. Operations Research in Today's Economy. Invited talk and panel discussion, First ORC Day, MIT Operations Research Center. October 15, 2011.

206. Cox, Tony. Principles of Microbial Risk Analysis. Invited lecture. University of Colorado Health Sciences Center. November 1, 2011.

207. Cox LA Reassessing the evidence on health benefits of cleaning air. *Society for Risk Analysis 2011 Annual Meeting.* Charleston, SC. December 7, 2011. http://birenheide.com/sra/2011AM/program/singlesession.php3?sessid=W3-I&order=1#1

208. Cox, Tony. Developing better risk management decision processes for real people. Invited presentation and panel discussion. *Society for Risk Analysis 2011 Annual Meeting.* Charleston, SC. December 5, 2011. http://birenheide.com/sra/2011AM/program/singlesession.php3?sessid=M4-F

209. Cox, Tony. Improving boken risk management decision processes. Invited talk, School of Industrial and Systems Engineering, University of Oklahoma. April 20, 2012.