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Biennial Report

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Harvard School of Public Health



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John D. Graham, PhD Director

The Harvard Center for Risk Analysis (HCRA) takes a distinctive approach to the challenge of allocating resources to protect and enhance the public health. Our methods, based on the decision and management sciences, call for rigorous yet separate analysis of the facts (probabilities) and the value judgments (ethics) involved in health protection. We argue that, in the long run, ill-considered departures from this approach will "murder statistical lives," leading to more death and human misery than is necessary.

There is a danger that analytical approaches might be poorly executed or misused, causing thoughtful decision making to be confused by a barrage of opaque mathematics. Yet there is an increasing global recognition that risk analysis will foster protection of the public's health. For example:

• The Organization for Economic Cooperation and Development (OECD) is promoting appropriate use of risk assessment and cost-benefit analysis in the regulation of existing chemicals and is preparing a report on ways in which Europe, Asia, and North America can use analytical tools to develop environmental policies.

• Several European countries and Australia are increasing use of costeffectiveness analysis in making health care reimbursement decisions involving pharmaceuticals and medical technologies.

• The World Bank and the World Health Organization (WHO) are using economic "burden of illness" methods in identifying health-related investment opportunities in the developing world.

• The US Department of Transportation is asking for the public's input on the risks, benefits, and costs of advanced airbag systems in motor vehicles.

• The Clinton Administration is endorsing legislation that promotes a stronger role for risk assessment and cost-benefit analysis in health, safety, and environmental regulations.

• The World Trade Organization (WTO) uses risk assessment to ensure that food-safety policies are not a cover for anti-trade activities.

If these policy initiatives are to work, organizations such as the HCRA must provide the research, communication, and education and training necessary to protect public health and the environment.

Harvard Degree Opportunities

PhD in Health Policy with Concentration in Risk/Decision Sciences

The university-wide PhD Program in Health Policy is designed for students interested in scholarly careers in environmental health, health care, mental health, and public health. HCRA faculty play a critical role in sponsoring students with interests in risk analysis and the decision sciences.

contact: Joan Curhan, 79 J.F. Kennedy Street, T460, Cambridge, MA 02138 (617) 495-1357 or joan_curhan@harvard.edu

MS/ScD in Health Policy and Management

The Harvard School of Public Health (HSPH) offers two advanced degrees, an MS degree and an ScD degree. The MS degree (1- or 2-year) is designed for professional students. HCRA faculty offer analytical coursework for students in this program. The ScD degree is reserved for physicians and lawyers interested in research.

contact: Kristine Forsgard, 677 Huntington Avenue, SPH3, 4th Floor, Boston, MA 02115 (617) 432-4511 or kforsgard@sph.harvard.edu

MS/ScD in Environmental Science and Risk Management

At the Harvard School of Public Health, the MS/ScD in ES&RM is designed for research-oriented students interested in environmental decision making. HCRA faculty collaborate with the School's Department of Environmental Health in the design and management of this program.

contact: Kristine Forsgard, 677 Huntington Avenue, SPH3, 4th Floor, Boston, MA 02115 (617) 432-4511 or kforsgard@sph.harvard.edu

HCRA Students

Lisa Prosser, MS

Lisa Prosser is a PhD candidate in Health Policy at Harvard University, concentrating in decision sciences. Her doctoral research focuses on the impact of perspective in health care decision making. Ms. Prosser holds a BS in mathematics (with a concentration in operations research) from Cornell University and MS degrees in management and in technology and policy from the Massachusetts Institute of Technology. She also spent three years with the Wilkerson Group in New York as a management consultant to several medical products companies.

Mary Ann Chirba-Martin, JD, MPH

Mary Ann Chirba-Martin is a candidate for the ScD in health policy at the Harvard School of Public Health. She holds a BA in biology from Colgate University, a JD from Boston College Law School, and an MPH from Harvard University. The ways in which the law impedes and promotes public health in the managed care and product safety marketplace is the focus of her doctoral research. Previously, she worked as a litigator for the Boston firm of Nutter, McClennan & Fish.

Timothy J. Carrothers, MS

Timothy J. Carrothers is an ScD candidate in the Joint Program in Environmental Science and Risk Management at the Harvard School of Public Health. Mr. Carrothers holds an MS and a BS in civil and environmental engineering from Stanford University. His thesis assesses the value of research regarding the health effects of particulate air pollution. He is also interested in the application of decision analysis in environmental management. He held an internship in risk assessment at ENVIRON.

Risk Quiz:

CECTY Which factor kills more people each year: firearms or motor vehicle crashes? CECTYEL (1995) Motor vehicle crashes, 42,252; firearms, 35,957.

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Risk-Related Courses for Graduate Students

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- Analytical Methods in Risk and Decision Sciences
 Dr. Kimberly Thompson
- Cost-Effectiveness Analysis and Cost-Benefit Analysis for Public Health and Medicine Dr. John Graham
- Decision Analysis in Clinical Research Dr. Milton Weinstein
- Decision Analysis for Health and Medical Practices
 Dr. Sue Goldie
- Decision Theory Dr. James Hammitt
- Methods for Decision Analysis in Health Care Technology Assessment Dr. Karen Kuntz
- Pharmacoeconomics and Policy
 Dr. Peter Neumann
- Regulatory Toxicology Dr. Lorenz Rhomberg
- Research Seminar on Risk and Decision Analysis
 Dr. James Hammitt
- Risk Assessment
 Dr. John Evans

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 Seminar on Risk Analysis, Management, and Communication
 Dr. Kimberly Thompson

Syllabi can be found on the WWW at www.hsph.harvard.edu/Organizations/hcra/ hcra.html

Faculty Profile

Milton G. Weinstein, PhD

Milton C. Weinstein is the Henry J. Kaiser Professor of Health Policy and Management and Biostatistics at the Harvard School of Public Health and Professor of Medicine at the Harvard Medical School. Best known for his research on the cost-effectiveness of medical practices, Dr. Weinstein also is director of the Program on the Economic Evaluation of Medical Technology. He is an elected member of the Institute of Medicine of the National Academy of Sciences, and a recipient of the Award for Career Achievement from the Society for Medical Decision Making. Dr. Weinstein received his AB and AM in Applied Mathematics (1970), his MPP (1972), and his PhD in Public Policy (1973) from Harvard University.



Suedl Goldle, MD, MPH

Sue J. Goldie, MD, MPH, is an assistant professor of health decision sciences at the Harvard School of Public Health in Health Policy and Management. She completed her postdoctoral clinical training in internal medicine at Yale University and an AHCPR postdoctoral fellowship with a concentration in decision science at the HSPH. Dr. Goldie's research interests include methods and applications of decision and cost-effectiveness analysis in the evaluation of population-based health care, particularly the screening and prevention of virally transmitted diseases and the sequelae. Her research focus includes women, individuals with HIVinfection, adolescents, and vulnerable populations (e.g. socioeconomically disadvantaged, cultural minorities).



COMMUNITY RISK SGALE



Risk Related Short-Course Opportunities

Analyzing Risk: Science, Assessment, and Management Dr. George Gray

This course, offered through HCRA and the HSPH Center for Continuing Professional Education, introduces students to the science and methods of risk assessment and its role in risk management and communication. Participants develop an understanding of the sources of variability and uncertainty in risk assessment, as well as the tools used for better characterizing risks. The importance of risk assessment in regulation and risk communication are also highlighted.

"Tops! Amazing content for one week. Quality of instruction is superb." Andrew V. Wittner, Economist United States Environmental Protection Agency Washington, DC

"One of the most stimulating, comprehensive programs I've attended in a long time. A must for decision makers. Outstanding faculty." Stephen D. Evans, EHS Manager MainYankee, Bath, Maine

For information on short-course opportunities contact Center for Continuing Professional Education, 677 Huntington Avenue, SPH3-LL23, Boston, MA 02115. (617) 432-1171

Cost-Effectiveness Analysis for Medical Technologies and Pharmaceuticals Dr. Peter Neumann

This is an advanced program on methods for performing cost-effectiveness analysis of pharmaceuticals and medical technologies. The course concentrates on costing and modeling alongside clinical trials, and the use of preference-weighted quality-of-life scales and contingent valuation methods in cost-effectiveness and cost-benefit studies. The program also provides students with an evaluation of diagnostic technologies, such as contrast media and imaging devices.

"Bravo! A first-rate and spectacular group of researchers, scholars, and educators." Joseph C. Cappelleri, PhD, MPH Senior Coordinator, Pfizer Central Research Groton, Connecticut

Benefit-Cost Analysis of Health, Safety, and Environmental Regulation Dr. James Hammitt

This course provides a rigorous introduction to the empirical methods and economic principles used in benefit-cost analysis (BCA) to quantify the costs of regulation and the benefits of improved environmental quality and reduced health and safety risks. The sessions on the theory and methods of BCA are complemented by in-depth discussion of BCAs conducted for several important applications, including automobile airbags, airborne particulates, food safety, and global climate change. Leading practitioners of BCA present realworld applications of this method, identifying both the strengths and the weaknesses of the BCAs that have been conducted in each area.

"Better than a semesters course in graduate school!"

David E. Burmaster, President, Alceon Corporation, Cambridge, Massachusetts

Faculty Profile



James K. Hammitt, PhD

James K. Hammitt is associate professor of economics and decision sciences at the Harvard School of Public Health. His teaching and research interests include the development and application of quantitative methods to health and environmental policy, including benefit-cost, decision, and risk analysis, game theory, and mathematical modeling. His current research focuses on the management of long-term environmental issues involving significant scientific uncertainties, such as global climate change and stratospheric-ozone depletion, and the characterization of social preferences over health and environmental risks using revealed preference and contingent valuation methods. Dr. Hammitt holds an AB and ScM in applied mathematics and an MPP and PhD in public policy, all from Harvard University. Before joining HCRA, he was a senior mathematician at the RAND Corporation and on the faculty of the RAND Graduate School of Policy Studies.

Economic Evaluation of Medical Technology romainiomilie



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m As}$ managed care increases its hold on US health care, American society must gain a better understanding of the clinical and economic implications of different medical technologies to improve decision making on the part of patients, physicians, payers, and policy makers.

The Program on the Economic Evaluation of Medical Technology (PEEMT) promotes such informed decision making in the use of pharmaceuticals, medical devices, and medical procedures.

This program accomplishes its mission in several ways. PEEMT brings together decision scientists, physicians, economists, epidemiologists, biostatisticians, and health services researchers to work on scientific research projects, training programs, and public policy activities. This multidisciplinary team also collaborates with leaders in the field worldwide.

PEEMT is expanding its efforts in education and research. These include an annual executive education short-course in advanced cost-effectiveness analysis geared to practitioners in industry, government, and academia and a conference with leaders in the field on the use of cost-effectiveness analysis in managed care environments.

On the research front, new projects are examining diagnostic and therapeutic advances in AIDS, Alzheimer's disease, asthma, cancer, coronary heart disease, and other medical conditions. In addition, PEEMT faculty and staff continue to work with public policy officials at the Food and Drug Administration (FDA), Health Care Financing Administration (HCFA), and other government agencies to explore ways to use economic evaluations in coverage and payment decisions.

Faculty Profile



Peter J. Neumann, ScD

Peter J. Neumann, ScD, is an assistant professor of policy and decision sciences in the Department of Health Policy and Management, and the deputy director of the Program on the Economic Evaluation of Medical Technology at the Harvard School of Public Health. His research focuses on economic evaluations of medical technologies, including ongoing evaluations of pharmacological treatments for Alzheimer's disease, asthma, lung cancer, and schizophrenia. Several peerreview journals have published his research on the use of willingness to pay and quality-adjusted life years (QALYs) in valuing health benefits. His other research has focused on the FDA's regulation of cost-effectiveness claims, government uses of cost-effectiveness analysis, and the impact of medical technology on health costs. He holds a doctorate in health policy and management from the Harvard School of Public Health.

COMMUNITY RISK SCALE



I. Prevention in the general population shown by months

Exercise consuming 2000 calories per week for 30 yrs from age 35 <i>Hatziandreu et al., 1998</i>	6Z months	
Annual mammography for 40 years from age 40 Lindfors and Rosenquist	1.3 months	
Pap smear every year for 55 years from age 30	3.2 conths	
Pap smear every 3 years for 55 years from age 30 <i>Eddy, 1990</i>	3.1 conths	
Measles vaccine <i>White et al., 1985</i>	.09 months	

II. Prevention in groups with elevated risk shown by months

Quit smoking at age 40 Fiscella and Franks, 1996				72 г	onths	
Prophylactic bilateral mastectomy for 30-year-old women at genetic risk Schrag et al., 1397			64	months		
Routine beta-blocker therapy for 55-year-old heart attack survivors Goldman et al., 1988	3 months					
Autologous blood donation before open-heart surgery Birkmeyer et al., 1994	.003 months	or 1 day				

III. Treatments shown by months

Thrombolysis with t-PA during acute myocardial infarction at age 50 Mark et al., 1995	1 month					
Chemotherapy for advanced testicular cancer Shibley et al., 1990					יז 107	untria
Chemotherapy for advanced non-small-cell lung cancer Jaakkimainen et al., 1990	2 month	s				

Life Expectancy Gains

When placed in context, increases in life expectancy are an important measure of medicine's effectiveness. We used target populations and diseases to categorize gains in life expectancy from a variety of medical interventions reported in 83 published sources.

We found that increases in expected life span from preventive strategies in populations at average risk range from less than one month to a little more than a year, per person receiving the intervention. In individuals at high risk, prevention resulted in gains as large as five years or more. For people being treated with established diseases, the gains in life expectancy range from several months to nine years.

Wright JC, Weinstein MC.

Gains in Life Expectancy from Medical Interventions-Standardizing Data on Outcomes. New England Journal of Medicine 1998; 339:380-6.

Selected Projects

AIDS

Cost-Effectiveness of Preventing AIDS Complications Dr. Sue Goldie

Alzheimer's Disease

Cost-Effectiveness of New Treatments for Alzheimer's Disease Dr. Peter Neumann

Asthma

Development of an Asthma Policy Model Dr. Karen Kuntz

Cancer

Cancer Prevention Policy Model Dr. Karen Kuntz Cost-Effectiveness Analysis of Colorectal Cancer Screening Dr. Karen Kuntz

Cost-Effectiveness of Chemotherapy for Advanced Non-Small-Cell Lung Cancer Drs. Milton Weinstein and Peter Neumann

Heart Disease

Coronary Heart Disease Modeling Project Dr. Milton Weinstein Cost-Effectiveness of Cholesterol-Lowering Strategies Dr. Milton Weinstein

Hormone Therapy Cost-Effectiveness of Hormone Replacement Therapy Dr. Milton Weinstein

Other

Database of Cost-Effectiveness Analyses which Use QALYs to Measure Health Effectiveness Dr. Peter Neumann FDA's Regulation of Cost-Effectiveness Claims Dr. Peter Neumann Uses of Cost-Effectiveness Analysis in Managed Care Drs. Milton Weinstein and Peter Neumann

Affiliated Faculty

David J. Cohen, MD Harvard Medical School Beth Israel Deaconess Medical Center

Graham A. Colditz, MD, DrPH Harvard Medical School Harvard School of Public Health

Kenneth A. Freedberg, MD, MS Boston University School of Medicine

Richard D. Gelber, PhD Harvard Medical School Harvard School of Public Health

James K. Hammitt, PhD Harvard School of Public Health

Richard C. Hermann, MD, MS Harvard Medical School

Maria G.M. Hunink, MD, PhD University of Groningen, The Netherlands

Jeffrey Katz, MD, MS Harvard Medical School

Stephanie J. Lee, MD, MPH Dana-Farber/Partners Cancer Care

Thomas Lee, MD, MS Harvard Medical School Partners Community HealthCare, Inc.

Matthew Liang, MD, MPH Harvard Medical School Harvard School of Public Health

Eugene Litvak, PhD Harvard School of Public Health

Joseph S. Pliskin, PhD Ben Gurion University of the Negev Beer-Sheva, Israel

Deborah Schrag, MD, MPH Dana-Farber Cancer Institute Harvard Medical School

Kimberly M. Thompson, ScD Harvard School of Public Health

Jane C. Weeks, MD, MS Dana-Farber Cancer Institute Harvard Medical School

Faculty Profile



Karen M. Kuntz, ScD

Karen M. Kuntz, ScD, is an assistant professor of decision sciences at the Harvard School of Public Health and an assistant professor of medicine at the Harvard Medical School. Her research has focused on the methodology and application of decision and cost-

effectiveness analysis in the evaluation of medical technologies. Dr. Kuntz's applied projects include the development of a policy model for asthma interventions, and the evaluation of cancer-prevention strategies. Her methodological projects involve the evaluation of potential biases that can occur in disease modeling. Dr. Kuntz received her masters and doctorate, both in biostatistics, from the Harvard School of Public Health.

COMMUNITY RISK SOALE



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Selected Projects

Global Climate Change Dr. James Hammitt

Non-Cancer Risk Assessment Dr. Lorenz Rhomberg

Pesticide Risk Assessment under FQPA Dr. Kimberly Thompson

The Precautionary Principle: Refine or Replace It? Dr. John D. Graham

Residual Risk from Air Toxics Dr. Kimberly Thompson

"Right to Know" about Risk Dr. George Gray

Value-of-Information Analysis of Fine Particle Control Dr. John Evans

Rogram on Environmental Science and Elsk Manan



Citizens often support stonger environmental policies on the grounds that risks to human health will be reduced or eliminated. Yet there is growing scientific evidence indicating that current environmental policies are not directed at the most significant sources of risk.

The mission of the Program on Environmental Science and Risk Management is to promote more informed decision making about environmental protection through greater use of analytic tools such as risk assessment, decision analysis, costeffectiveness analysis and benefit-cost analysis. The program, a joint venture of the Center for Risk Analysis and the Department of Environmental Health of the Harvard School of Public Health, allows students to work collaboratively with risk analysts, economists, and environmental scientists on new approaches to protecting people from exposure to environmental pollution.

The program's creators believe a more rigorous use of risk assessment will likely enhance the public health benefits of environmental policies and reduce costs through the design of more flexible policies.

Do Scientists and the Public Agree About Hazards? Mean Confidence Scores (0-10 scale)

Hazard	Lay Sample		Scientist San	ipie
	MEN	WOMEN	MEN	WOMEN
Second-Hand Smoke	7.20	8.01	7.00	7.98
Ozone Depletion	6.40	7.69	6.94	6.79
Outdoor Particles	6.55	7.40	6.77	7.29
X-Rays	5.37*	6.00	6.85	6.17
Radon	5.63	6.85	5.84	6.40
Global Warming	5.74	7.02	5.73	6.60
Food Pesticides	6.42*	7.43*	4.24	5.52
Magnetic Fields	4.95*	6.06*	3.16	4.54
All Hazards	6.04	7.05*	5.82	6.41

Faculty Profile



John Evans, ScD

John Evans, ScD is a senior lecturer in environmental health at the Harvard School of Public Health, where he co-directs the Program on Environmental Science and Risk Management. His research has focused on several areas, including the study of mortality from exposure to ambient particulate matter, health consequences of accidental releases at nuclear power plants, analysis of the benefits of alternative research strategies in support of environmental decision making, and characterization of uncertainty in estimates of environmental exposures and health risks.

Dr. Evans earned his BS in industrial engineering and MS in water resources management at the University of Michigan. He served as a bioenvironmental engineer in the US Air Force from 1972-76. After completing his tour of duty, Captain Evans earned his SM and ScD in environmental health sciences at Harvard University. Following his doctoral work, he was selected as a fellow with the Advisory Committee on Reactor Safeguards at the US Nuclear Regulatory Commission.

Dr. Evans is a member of the Science Advisory Board (Drinking Water Committee) of the US Environmental Protection Agency and has recently been chosen by the Society for Risk Analysis as the area editor for Human Health Risk Analysis for *Risk Analysis: An International Journal.*

COMMUNITY RISK SCALE



Dissertation Projects

Systematic Uncertainties Confounding Animal Bioassay Based Extrapolations of Chronic Human Health Risk from Chemical Exposure Kevin Brand

The Value of Alternative Research Strategies in Support of Decision Making for Fine Particles in Ambient Air **Timothy J. Carrothers**

The Role of Subjective Judgment in Exposure Assessment: The Case of Personal Exposure to Benzene Katherine Walker

Evaluating Conventional and Non-Conventional Agricultural Systems: Risks and Perspectives Pamela Williams

The Cost-Effectiveness of Alternative Strategies for the Control of Fine Particles in Ambient Air Scott Wolff

Risk Quiz:

Geory: Whitch (Ederal) risk-protection agency/has the larger annual budgets Tibe Environmental Protection Agency or the Food and Drug Administration?

Answer: Tile annual budget of the Environmental Protection Agency (\$7 billion) is much larger than the Food and Drug Administration (\$1 billion).

Source: OMB, annual

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Selected Projects

Assessment of the Potential for Bovine Spongiform Encephalophathy in the United States

Drs. George Gray, Silvia Kreindel, James Hammitt, and Kimberly Thompson

A Framework for Characterizing Risks from Organic and Conventional Agriculture Dr. George Gray and Pamela Williams

Risk Assessment in World Trade: The Case of Hormone Treated Beef Dr. George Gray

Risk/Risk-Tradeoffs in Pesticide Regulation: Evaluating a Ban on Organophosphate Insecticides Drs. George Gray and James Hammitt

Survey of Organic and Conventional Fresh **Produce Buyers** Dr. James Hammitt and Pamela Williams

Working Group on the Food Quality Protection Act Pamela Williams





 Γ he Program on Food Safety and Agriculture (PFSA) is a multidisciplinary effort to assess safety risks to the American food supply. Students in the PFSA will develop methods for risk assessment of food-borne contaminants, analyze specific food safety issues, and work alongside experts in the areas of risk assessment, food safety, and agriculture.

A main goal of the program is the education of legislators, community leaders, and journalists on the importance of risk analysis in the promotion of a safe food supply. Program leaders have testified at the state and federal level about food safety issues and worked closely with print and broadcast reporters and the editors of scholarly publications on their stories about food safety and agriculture. Program highlights include a workshop and journal publication to introduce the broader risk-analysis community to phytosanitary risk assessment, a study on the value of research on food safety, and research on risk/risk-tradeoffs in pesticide regulation.

Future projects will focus on the use of risk analysis in food safety, particularly as it relates to international trade. The North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT) both demand science-based risk assessments to support sanctions on specific commodities. Adjudication of disputes over food risks by the World Trade Organization (WTO) will stimulate interest in assessment of the potential risks of new agricultural technologies like bioengineered crops and irradiated food. It also will bring to the forefront questions of social and economic valuation of health and environment, a key HCRA interest. Implementation of the Food Quality Protection Act of 1996 will be another major area of study.

A new project will examine potential pathways for development of bovine spongiform encephalopathy (BSE) in US cattle, identify the effect of current regulations and risk-management practices for the prevention of BSE, and recommend surveillance and monitoring improvements to ensure the integrity of the US beef herd. Students also will investigate the ways in which TSE agents from cattle enter the food supply and evaluate the efficacy of current regulations concerning food processing and animal rendering in ensuring food safety.

Recent HCRA Report

The Federal Government's Agricultural Health Study: A Critical Review with Suggested Improvement (December 1998)

This HCRA report evaluates a large-scale epidemiological study that has enrolled 90,000 farmers and farm family members in Iowa and North Carolina who may be exposed to chemicals used on the farm. Prepared in collaboration with an advisory committee chaired by Dr. Bernard Goldstein of the RWJ Medical School, the report offers scientific recommendations to both government and industry.

Risk Quiz:

Guery: Offell pesticide residues analyzed on fresh produce, how many exceeded IBPA standards? Answer: 4 out of 4545 (0.033%).

Source: 1997 USDA Pesticide Data Programs

Faculty Profile



George ML Gray, PhD

George M. Gray, PhD, is a research associate and instructor in risk analysis in the Harvard Center for Risk Analysis at the Harvard School of Public Health. Dr. Gray is a strong proponent of the use of more and better scientific information in risk assessment and riskbased frameworks in guiding society's efforts to manage health hazards. His research interests include the role of risk assessment in food safety, the interpretation of animal bioassay data for risk assessment, characterization of risk, and the use of risk information in public and corporate decision making on health, safety, and the environment.

Dr. Gray teaches toxicology and risk assessment at the Harvard School of Public Health and directs the center's continuing education short course, "Analyzing Risk: Science, Assessment, and Management." He has worked with several companies and trade organizations.

Risk Quiz:

Overy: In 1997 camples, what percentage of fush produce contained detectable levels of at least one peatied bused in growing? Answer: 56 % or 17/11 out of 3030 camples.

Source: 1997 USDA Pessicide Data Programs

COMMUNITY RISK SGALS



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Selected Projects

Cost-Effectiveness Analysis of Current and Refined Airbag Designs Dr. Kimberly Thompson

Legal Analysis of Child Seating Laws Mary Ann Chirba-Martin

Occupant Restraints: Public Perceptions, Knowledge, and Attitudes Dr. John Graham

Optimal Airbag Deployment Threshold Dr. Maria Segui-Gomez

Passenger Airbag and Child Seating Behaviors Eve Wittenberg

Retrospective Evaluation of Benefit and Cost Estimates for Auto Safety Rules Dr. John Graham

The Safety Risks and Advantages of Sport-Utility Vehicles Edmond Toy

Recent Publications

The Cost-effectiveness of Air Bags by Seating Position. Graham JD, Thompson KT, Goldie SJ, Segui-Gomez M, Weinstein MC. JAMA. 1997:278:1418-1425.

Reducing Risks to Children in Vehicles With Passenger Air Bags. Graham JD, Goldie SJ, Segui-Gomez M, Thompson KT, Nelson TF, Glass R, Simpson A, Woener LG. Pediatrics. 1998:102:July:e3.

Where Children Sit In Motor Vehicles: A Comparison of Selected European and American Cities. Segui-Gomez M, Glass R, Graham JD. Injury Prevention. 1998:4:98-102.



In most developed countries, the leading killer of young people between the ages of one and 35 is motor vehicle crashes. The Program on Automotive Safety is dedicated to identifying policies that will reduce the risks of motor vehicle crashes in a cost-effective manner. For example, center investigators have estimated that a driver-side airbag costs about \$20,000 for each year of life that is saved, where each year is adjusted for health-related quality to account for nonfatal injuries prevented (and caused) by airbags.

This program is a joint venture of the Center for Risk Analysis and the Injury Control Research Center at the Harvard School of Public Health. Students in the program have access to faculty expertise in epidemiology, engineering, behavioral science, and the analytic methods of risk analysis.

The primary focus of the Program on Automotive Safety is the improvement of crash protection through optimal occupant seating positions, proper use of safety belts and child restraints, and installation of advanced airbag designs. For example, Ford Motor Company has announced plans to install advanced airbag systems that modify airbag deployment based on crash speed, safety belt use, and presence of a child in the front seat. Recently, the program has begun to investigate the unique safety issues associated with sport-utility vehicles and light trucks, the fastest growing category of new vehicle sales in the US and other developed countries.

Risk Quiz:

Statement Theor False More lives of children under the age of 12 have been lost them have been enved by althag deployment in the USA. Answer: Theo

Source: HCRA

HCRA Classics



Preventing Automobile Injury: New Findings from Evaluation Research John D. Graham 1988, Auburn House Publishing Company Dover, MA

This book relates the emerging interest in injury control to the science of traffic safety. State-of-theart evaluation research methods are employed to assess the merits of policies designed to prevent automobile-related injuries in three problem areas: drunk driving, occupant restraint use, and highway speeding.

"...contains an array of stimulating and insightful analysis about increasing highway safety. Experts from different disciplines actually engage each other on what we know, how we can make research more definitive, and how we can design better policy."

Lester B. Lave, Carnegie Mellon University Graduate School of Industrial Administration



Auto Safety: Assessing America's Performance John D. Graham 1989, Auburn House Publishing Company Dover, MA

This book explains why the USA is the only country in the world to **require** driver and passenger airbags in all new cars and light trucks.

"<u>Auto Safety</u> explains how airbags became the Maginot Line of regulatory politics." Chuck Hurley

National Safety Council

To order a copy of this book please contact HCRA, 718 Huntington Avenue, Boston, MA 02115 or (617) 432-4497.

Profile



Maria Segui-Gomez, MD, MPH, Msc, SeD Gandidate

Maria Segui-Gomez, a physician from Spain, is a doctoral candidate in the Department of Health Policy and Management at the Harvard School of Public Health. As deputy director for the Harvard Injury Control Research Center, Dr. Segui-Gomez has been working on several projects in collaboration with the Harvard Center for Risk Analysis.

Her thesis brings state-of-the-art economic evaluation methods to the injury prevention field. Recently, she conducted a review of cost-benefit and cost-effectiveness analysis and their application to injury prevention programs. Specifically, Dr. Segui-Gomez is using cost-effectiveness methods to define the optimal deployment threshold for automotive airbags.

COMMUNITY RISK SOALE

Risks:

1.5 in 100,000





Special Project Children's Coalth

Kimberly M. Thompson is spearheading a new project at the HCRA involving the use of risk management in the protection of children. The project seeks to promote a reasoned response to the health, safety, and environmental hazards that affect the nation's children.

Analytical techniques will be used in evaluating the performance of national activities to protect and promote the welfare of children. Currently there are no national standards involving risk reduction strategies for the protection of children. The project will take a cross-cutting approach to reducing risks to children, and will provide a common ground for the national debate on child welfare.

Top 10 Leading Causes of Death for Different Age Groups

CAUSE	ALAGES	ACES 1 14	INFANTS
Heart disease	1	5	
Malignant neoplasms	2	2	
Cerebrovascular	3		
Bronchitis/Emphysema/Asthma	4	10	
Unintentional injuries	5	1	7
Pneumonia and influenza	6	8	9
Diabetes	7		
HIV	8	6	1.1
Suicide	9	7	
Liver disease	10		
Congenital anomalies		3	1
Homicide		4	
Benign neoplasms		9	
Short gestation			2
Sudden Infant Death Syndrome			3
Respiratory Distress Syndrome			4
Maternal complications			5
Placenta cord membranes			6
Perinatal infections			8
Intrauterine hypoxia			10

Faculty Profile



Kimberly M. Thompson, ScD

Kimberly M. Thompson, ScD is assistant professor of risk analysis and decision sciences in the Department of Health Policy Management. She is a faculty member in the Program in Environmental Science and Risk Management and the Program on the Economic Evaluation of Medical Technology. She received her ScD in environmental health from the Harvard School of Public Health, and a BS and MS in chemical engineering from the Massachusetts Institute of Technology. Professor Thompson's research and teaching focus on issues related to developing and applying quantitative methods for risk assessment and risk management, and consideration of the public policy implications associated with including uncertainty and variability in risk characterization. Dr. Thompson's research interests include analysis of risks to children, how the public responds to different ways of presenting information, about environmental risks, and how application of value-ofinformation tools can improve risk management. She is currently collaborating with women's health groups in the development and testing of a tool to help consumers evaluate risk information and make wise decisions about risks.

Special Project Tome Safety

In 1997 the National Association of Home Builders commissioned the Harvard Center for Risk Analysis and the Harvard Joint Center on Housing to examine the scientific and economic basis of building codes. The HCRA is developing and applying a risk-tradeoff model that can assist code makers responsible for building safety.

Code-making officials in the US and abroad are reviewing residential building codes aimed at protecting the buyer of a new home from health and safety hazards. In some parts of the world, concerns are natural hazards posed by earthquakes, hurricanes, tornadoes and floods. In other regions, the primary concerns are falls on stairways within the home.

Although proposals of new codes are often well-intentioned, they rarely undergo formal analysis to determine their potential benefits, risks, and costs. The economic issue is particularly salient to the buyer of a "starter home," who may be very sensitive to small increments in price. An innovative feature of the HCRA's approach is a comparison of the risks of new homes to the risks faced by people who live in the existing housing stock.



James Hammitt, Eric Belsky, John Graham, and John Levy

COMMUNITY RISK SCALE Risks: 1/1 Risks: 1/10 fami Risks: 1/100 Death from all causes small village 8 in 100 Risks: 1/1000 Stroke-ages 65 and older street 4 in 1,000 Cancer-ages 45 to 64 2.5 in 1,000 Risks: 1/10000 Lung cancer 6 in 10,000 Unintentional injury 3.4 in 10,000 Homicide 1 in 10,000 Risks: 1/100000 Leukemia large town 7.6 in 100,000 Accidental poisoning 3.5 in 100,000 Fires/Drowning 1.5 in 100,000 Risks: 🕼 million Killed by a coworker city 9 in 1 million Tuberculosis 5 in 1 million Train accident 2 in 1 million

Seminar Series

Donald Berry Duke University Genetic Risk of Breast Cancer and Genetic Testing Decisions

Gretchen Chapman Rutgers University Time Preferences and the Decision to Get a Flu Shot

Karl Claxton Harvard Center for Risk Analysis The Irrelevance of Inference: A Decision Making Approach to the Stochastic Evaluation of Health Care Technologies

Robert Clemen Duke University Does Decision Analysis Work? Evidence and a Research Agenda

Louis Anthony Cox University of Colorado Learning Partial Causal Models From Ambiguous Epidemiological Data

David Feeny McMaster University Multiattribute Utility Functions/ Health Utilities Index

Scott Ferson Applied Biomathematics Andrew Gelman Columbia University Decision Analysis in the Context of Hierarchical Modeling: The Case of Home Radon Mapping

Charles Harvey University of Houston How to Discount Over Continuous Time

F. Reed Johnson Triangle Economic Research Stated Preferences and Willingness to Pay for Respiratory and Cardiovascular Health States

Stan Kaplan Chairman, Bayesian Systems, Inc. The Quantitative Approach to Risk, Regulation, and Decision—Frontiers and Opportunities Thomas Kniesner Indiana University Anthony LoSasso Northwestern University Shifting the Burden of Long-Term Care?

Hilary Llewellyn-Thomas University of Toronto Assessing Patients' Preferences for Preventive Therapies

Richard Morgenstern Resources for the Future William Pizer Resources for the Future Are We Overstating the Costs of Environmental Protection?

Christopher Murray Harvard School of Public Health New Approaches to Health State Preference Measurement

Doug Owens Stanford University Sudden Death and the Implantable Defibrillator

A. David Paltiel Yale School of Management Allocating HIV Prevention Resources: Community Planning

Lorenz Rhomberg Harvard School of Public Health Cross-Species Extrapolation of Toxicity Estimates

V. Kerry Smith Duke University Nonmarket Valuation and the Household: Recovering Individual Preferences With Collective Risks

Rakesh Sarin University of California - Los Angeles Decisions Under Ambiguity: Theory and Empirical Evidence

Aaron A. Stinnett University of Alabama Analyzing Uncertainty in Cost-effectiveness Analysis

Robert Temple United States Food and Drug Administration Approval of New Drugs and the Ethics of Placebo-Controlled Studies

Peter Ubel University of Pennsylvania School of Medicine Pricing Life: Does Cost Effectiveness Analysis Capture People's Preference for How to Ration Health Care?

Kip Viscusi John F. Kennedy School of Government Joni Hersch University of Wyoming Cigarette Smokers as Job Risk Takers



Risk vs. Risk: Tradeoffs in Protecting Health and the Environment John D. Graham and Jonathan Baert Wiener 1995, Harvard University Press Cambridge, MA (617) 495-2606

Risk vs. Risk marshals an impressive set of case studies which demonstrate that all too often our nation's campaign to reduce risks to our health and the environment is at war with itself.

"Professionals and policymakers should find this volume quite useful and thought provoking... This work might also begin a dialogue that will help develop a more holistic way of thinking about our problems and stimulate demand for a more democratic and informed policymaking process." John S. Klemanski,

Perspectives on Political Science



Harnessing Science for Environmental Regulation John D. Graham 1991, Praeger Publishers Westport, CT (203) 226-3571

Harnessing Science examines the role of science in toxic chemical regulation at the US Environmental Protection Agency. The book postulates that scientific knowledge and advice from experts outside of government is critical to the competence and credibility of regulations designed to protect public health.

To obtain a copy of either book please contact the publisher at the phone numbers listed above.

HCRA's Visiting Scholars

Jin-Tan Liu, PhD

Jin-Tan Liu holds a PhD in economics from Vanderbuilt University. He is the chairman of the Department of Economics at National Taiwan University and is a professor in the Department of Economics at NTU. His research interests include economics as applied to the environment, health care, and industry.

Paul Glasziou, MB, BS, PhD, FAFPHM

Paul Glasziou is a clinical epidemiologist and general practitioner at The University of Queensland Medical School. He is the associate editor of *Evidence-Based Medicine*, and serves as a member of the Australian Benefits Economic Committee, reviewing the cost-effectiveness of new pharmaceuticals. His primary research and teaching focus is the improvement of medical decision-making, particularly through the use of evidence-based medicine.

Charles M. Harvey, PhD

Charles M. Harvey is professor of decision and information sciences at the University of Houston. Dr. Harvey received his PhD in mathematics from Stanford University. He received his AB from Harvard University. In the field of decision analysis he has developed models of individual and social values with respect to risk, trade-offs between multiple objectives, and the importance of future events.

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The Howard Raiffa Fellowship Fund has been established to recognize the distinguished career of Professor Howard Raiffa, who pioneered the field of decision analysis. The fund will support the work of promising young scholars at the Center for Risk Analysis and promote future achievements and progress in the area of risk analysis. Donations can be made to the Howard Raiffa Fellowship fund by sending a check made out to the Harvard Center for Risk Analysis. Please specify on the check that it is a donation to the Raiffa fund. All donations may be sent to HCRA, 718 Huntington Avenue, Boston, Massachusetts 02115.

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country

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4 in 100 million

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