

***Ninth E. Leonard Arnoff Memorial Lecture
on the Practice of Management Science***

***“Policy Modeling for Better Decisions:
The Case of HIV Prevention”***

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HIV prevention programs are intended to slow the spread of the AIDS virus in the population, so it is not surprising that much of HIV prevention research has focused on evaluating the success (or lack thereof) of alternative interventions. Knowing whether programs "work" is necessary for constructing a coordinated HIV prevention strategy, and mathematical models have proven useful in estimating the effectiveness of alternative prevention programs. However, public funds for HIV prevention are limited: the 1999 US Federal Budget allocated \$775.3 million to HIV prevention activities (about 8% of total federal AIDS spending or 4/10,000ths of the total 1999 budget). Building a portfolio of prevention programs in such a resource-constrained environment requires thinking about HIV prevention as a function of investment. The question is not whether programs succeed or fail, but rather how to form an effective portfolio of programs within a budget constraint. Over the past few years, researchers and policy officials in the US and abroad have paid increasing attention to this issue. Focusing on the decisions faced by public officials, mathematical models that link the operations of HIV prevention programs to epidemic outcomes, and/or estimate the cost-effectiveness of programs in preventing new infections, are in demand. This talk will review and expand upon the issues raised above, often via recourse to selected HIV prevention activities and associated policy models.

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Edward H. Kaplan, PhD obtained his BA from McGill University in 1977 with First Class Honors in Economic and Urban Geography. He proceeded to graduate study at the Massachusetts Institute of Technology where he completed three masters degrees (in Operations Research '79, City Planning '79, and Statistics '82) in addition to his 1984 doctorate in Urban Studies. He currently serves as Professor of Management Sciences at the Yale School of Management, Professor of Public Health at the Yale School of Medicine and Director of the Law, Policy and Ethics Core at Yale's Center for Interdisciplinary Research on AIDS.

Professor Kaplan is an expert in operations research and statistics who has developed novel methods for quantitatively evaluating HIV intervention programs. The author of more than 80 peer-reviewed publications,

he co-edited the book *Modeling the AIDS Epidemic: Planning, Policy and Prediction* (Raven Press, 1994 with Margaret Brandeau). His applications of mathematical and statistical modeling to the study of HIV prevention were rewarded with the 1994 Lanchester Prize and the 1992 Franz Edelman Management Science Achievement Award, two of the top awards in the field of operations research. Professor Kaplan was twice awarded the Lady Davis Visiting Professorship at the Hebrew University of Jerusalem (School of Public Health in 1994, Department of Statistics in 1997) where he studied AIDS policy issues facing the State of Israel. His study of the public health consequences of Israel's ban on Ethiopian blood donors was reported on the front page of *The Jerusalem Post*. Kaplan's current research links the operations of HIV prevention programs to epidemic outcomes, examines the cost-effectiveness of individual intervention programs, and proposes approaches to allocating HIV prevention resources.

The subject of special reviews by the General Accounting Office, the Centers for Disease Control, and the National Research Council, his research demonstrating the effectiveness of New Haven's needle exchange program remains among the most creative and important examples of HIV program evaluation to date. Recognizing the public health impact of his needle exchange research in Connecticut, Kaplan was awarded the Connecticut Health Commissioner's AIDS Leadership Award in 1991, the New Haven Foundation's Ivy Award in 1991, and the Ira V. Hiscock Award of the Connecticut Public Health Association in 1997. His research has been cited numerous times by cities and states that have created legal needle exchange programs, and received widespread coverage in the media (including front-page coverage by *The New York Times* and an appearance on NBC's *Today Show*).

Professor Kaplan teaches courses in Policy Modeling, Operations Research, and Data Analysis and Statistics at Yale, where he received the Alumni Teaching Award from the Yale School of Management in 1991. He has also taught and/or held visiting appointments at MIT's Sloan School, the Technion-Israel Institute of Technology, the Hebrew University of Jerusalem, the Survey Research Center at UC Berkeley, the Kennedy School at Harvard University, and the College of Management at UMASS/Boston.

He is the Area Editor for Policy Modeling and Public Sector Operations Research for the journal *Operations Research*, and serves on the editorial boards of the *Journal of AIDS, Health Care Management Science*, and the *Journal of Mathematics Applied in Medicine and Biology*. He served on the Scientific Program Committee for the 12th World AIDS Conference in Geneva. Currently he is on the Advisory Board of Carnegie Mellon University's Heinz School of Public Policy and Management, the Scientific Advisory Board of the American Foundation for AIDS Research, and the Institute of Medicine's Committee on HIV Prevention Strategies.

“Disparate interests have common science: QAOM”

by Carey Hoffman

UC Currents, University of Cincinnati, April, 2000.

When a lecturer comes to campus and presents on subjects as dissimilar as AIDS prevention and NCAA tournament basketball pools, a natural question arises about what common bond could tie those areas together.

In the example of this lecturer – Yale University's Edward H. Kaplan – the answer is management science, the use of mathematics to solve planning problems in business and industry. The diversity of his two topics tell you important information about this field.

Kaplan's visit was part of the College of Business Administration's CBA Week celebration and was sponsored by the Department of Quantitative Analysis and Operations Management. Kaplan delivered the ninth E. Leonard Arnoff Lecture on the Practice of Management Science on May 25, then followed the next morning with a seminar on “March Madness and the Office Pool”.

Kaplan's presentations provided high profile examples of the practical contributions that can come through management sciences. His Arnoff Lecture focused on policy modeling for HIV prevention, an area where he has applied his expertise in operations research and statistics and become one of the most recognized figures nationally on AIDS health policy. Besides his appointment in the Yale School of Management, Kaplan is also a professor of public health at the Yale School of Medicine and the director of the Law, Policy and Ethics Core of the Yale Center for Interdisciplinary Research on AIDS. He did breakthrough analysis demonstrating the effectiveness of a needle exchange program in Connecticut that continues to be a guiding force in the national debate on that subject.

Michael J. Magazine, Ohio Eminent Scholar and UC professor of quantitative analysis and operations management, believes that Kaplan's campus visit provides an able example of the capabilities of management

science.

“I really believe that our field provides a wonderful opportunity to work on a variety of problems, affecting health care, manufacturing, the environment, the sports field and on and on,” Magazine says. “People in management science deal with problems of such a range that it’s just incredible.”