Workshop on Health Systems Modeling

Margaret L. Brandeau,
Stanford University

2 December 2019
University of Auckland, City Campus

Sponsored by Healthier Lives – He Oranga Hauora

Prof. Brandeau is a recipient of the University of Auckland Distinguished Visitor Award

To register please visit the eventbrite page.
For more information please contact cameron.walker@auckland.ac.nz

Providing effective, affordable, and accessible healthcare is a key challenge of the 21st century. Healthcare costs have been steadily increasing in recent decades but resources for providing healthcare are limited. In addition, inefficiencies in healthcare provision have contributed to lower quality care and higher costs. This 1-day workshop describes how analytic and computational tools – and, more generally, an analytic way of thinking – can be used to support the design and management of effective and efficient healthcare systems.

We describe current trends in health (e.g., continual emergence of new treatments and technologies, new care venues, availability of massive amounts of data). Then we describe the role that analytics can play in helping to harness the power of data and technology to provide effective, efficient, and affordable care to all people. We focus on three broad areas of health: healthcare operations, clinical decision making, and public health decision making.

Healthcare operations: We provide an overview of areas where analytical tools can add value in the design and control of healthcare operations. These include quality control and management, capacity planning, resource allocation, inventory control, management of patient flows, and scheduling. To illustrate these ideas, we describe a number of projects we are currently carrying out at Lucile Packard Children's Hospital Stanford. These include, for example, prediction of surgical case length and surgical recovery length, operating room scheduling, surgical supply management, nurse workload forecasting, and patient census forecasting.

Clinical decision making: Physicians often face complex decision problems in the diagnosis and treatment of patients. Each patient is unique, and symptoms may map to many different diagnoses. Once a patient is diagnosed, a treatment plan must be developed. We describe how data analytics and tools from stochastic dynamic decision making can be used to assist in the diagnosis and treatment of patients. We illustrate these ideas with examples including an analysis of personalized blood pressure management.

Public health decision making: When deciding which programs to invest in, public health decision makers face a number of challenges, including limited resources to invest among many potential programs, incomplete information about the potential effects of programs, and objectives that include not only health maximization but social, political, and cultural considerations. OR-based modeling can play a key role in informing such decisions: by providing a structured framework that uses the best available evidence, imperfect as it may be, and that captures relevant uncertainties, complexities, and interactions, OR-based models can be used to evaluate the potential impact of alternative public health programs. We describe how a variety of modeling techniques can be used to inform good public health decisions. These include simple cost analysis, cost-effectiveness analysis, statistical and probabilistic analysis, decision analysis, risk analysis, simulation, Markov models, linear programming, and simulation, analysis, and control of dynamic systems. We illustrate these ideas with examples including analysis of programs for the control of hepatitis B virus, programs to control the US opioid epidemic, and jail diversion programs for drug offenders.

To register please visit the eventbrite page.
For more information please contact cameron.walker@auckland.ac.nz

Workshop on Health Systems Modeling

SCHEDULE

9:00-9:15	Workshop overview and goals
9:15-10:00	Trends and challenges in healthcare
10:00-10:30	Identification of key health problems and opportunities in New Zealand
10:30-10:45	Break
10:45-11:30	Analytics in healthcare operations management
11:30-12:15	Analytics in clinical decision making
12:15-1:15	Break
1:12-2:00	Analytics in public health decision making
2:00-3:00	Discussion of key health problems and opportunities in New Zealand
3:00-3:15	Break
3:15-4:00	Analytical projects in a California hospital: Successes, failures, and opportunities
4:00-4:30	Open discussion and conclusions