



2012-13 Program on Data-Driven Decisions in Healthcare (DDDHC)

Background

Healthcare is one of the central political, economic and social issues of our times. In the healthcare process, decisions are made at every level from the treatment of individual patients to formulation and evaluation of national policies. The SAMSI program on DDDHC will address issues of mathematical and statistical theory and methodology that will improve evidence-based healthcare decision-making. The goals are to

- Strengthen the link between data and decisions, a path that includes major challenges in mathematical modeling and statistical inference.
- Highlight and increase the role that statistics, applied mathematics and operations research can play in making data-driven healthcare decisions.

Themes

Two principal themes have been identified. Details of the research will depend strongly on the set of participants.

Operations Research Modeling, with particular emphasis on resource allocation. The depth of interest in healthcare in the operations research community is enormous. Meeting programs of INFORMS, the principal society, contain dozens of sessions on healthcare topics. One planned focus is mathematical model building and use of different forms of simulation (e.g., discrete-event and agent-based simulations) as tools for evaluation of models, operational practices and policies. Other anticipated mathematical emphases include discrete optimization, Markov decision processes, dynamic programming, network modeling and stochastic control.

Potential working group foci are

- Screening policies
- Management of transplant lists
- Emergency response
- Scheduling (e.g., of patients, nurses, physicians and facilities such as operating rooms)

- Inventory management (e.g., of blood banks)
- Patient safety
- Service delivery.

Comparative Effectiveness Research, which attempts to determine *what*—ranging from behavioral modification to surgical intervention to medication—works *for whom, for which medical problems, and under what circumstances*. Potential foci of working groups include

- Observational medical studies
- Computational issues and massive data
- Data quality and data integration
- Combining information
- Case mix
- Disease surveillance
- Electronic medical records and new information collection technologies.

Schedule, Activities, Participation

The DDDHC program will take place throughout the 2012-13 academic year. The *Opening Workshop* will be held in Research Triangle Park, NC on August 26-29, 2012. The *Transition Workshop* will be in the late spring of 2013. Several mid-program workshops are anticipated.

The principal research activities will take place in *Working Groups* formed at the Opening Workshop, which will meet weekly throughout the year.

Opportunities to engage in the DDDHC program include

- Visits to SAMSI for researchers in academia, government and industry, for periods ranging from several weeks to an entire semester or year
- Postdoctoral Fellowships, which include a second year carrying out research begun during the program year
- New Researcher Fellowships, for those within six years of receiving their doctorate
- Visits (semester- or year-long) to SAMSI by graduate students
- The Working Groups, including remote participation by means of WebEx
- Workshops

Further Information

For additional information, visit the SAMSI web site: www.samsi.info.