

“Patients Aren’t Widgets!”

Non-Technical Challenges in Applying OR/MS in the Canadian Health Care System

AnalysisWorks Inc



Introduction: About Us

AnalysisWorks Inc.

- We are a Vancouver-based consultancy that combines practical management consulting with advanced analytical tools to help organizations achieve measurable improvements
- Unique combination of analytical, business management and data transformation skills

Introduction: About Us

Types of projects

- Methodology development
- Reviews, profiles, and assessments
- Process re-engineering
- Workload forecasting and planning
- Systems modeling

Relevant clients

- BC Health Authorities, MoH, Ont, CIHI
- Other industries, private clients

Why Health Care Modeling is Challenging

➤ Reasons

- ◆ Inherent variability
- ◆ Flexible capacity
- ◆ Low trust environment
- ◆ Data quality
- ◆ Measurement of key outputs
- ◆ Change

➤ Pitfalls

➤ Solutions

Why Health Care Modeling is Challenging Inherent Variability

- Patient factors
 - ◆ Overall health level, presence of risk factors, reactions to medications and therapies, tolerance to pain, ability to communicate, and awareness of the health system
- Care providers
 - ◆ Vary considerably in their training, experience, diagnostic ability, ability to communicate, and understanding of the capabilities of other care providers

Why Health Care Modeling is Challenging Flexible Capacity

- Health care providers are extremely resourceful
 - ◆ When faced with surges in demand for services, health care providers work faster and handle higher caseloads
- It's hard to model changing capacities and speeds

Why Health Care Modeling is Challenging Low Trust Environment

- “Who’s problem is this anyways?”
 - Lack of incentives for patient flow
 - “We have it worse than any program”
 - Gain at another program’s loss
 - Local optimization
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- It’s hard to work on system-level solutions in a low trust environment

Why Health Care Modeling is Challenging Data Quality

- Medical standards versus operational standards
- Secondary sources of data
- It's relatively easy for clinicians to claim that an analysis or model is flawed when there are data quality issues

Why Health Care Modeling is Challenging Measurement of Key Outputs

- Lack of health outcomes data
- For example, comparing:
 - ◆ Cataract surgery to a hip replacement
 - ◆ The outcome of a new expensive cancer treatment program, to the outcome of multiple patients accessing a less expensive older treatment program
- It's hard to improve a system when a key output metric is missing

Why Health Care Modeling is Challenging Change is Certain

- By virtue of being exploratory, things will not always go as planned
- Changes are otherwise always happening
 - ◆ New initiatives, new pressures
 - ◆ People come, people go
- Expectations grow along the way
- Many find it hard to keep up with the ambiguity and change

Common Technical Pitfalls

- Data: too little or too much
- Failure to validate models
 - ◆ Developing a body of proof that the model reasonably represents the modeled system
- Modeling detail:
 - ◆ Keeping the model focused on the problems to be addressed
 - ◆ More detail ≠ More accurate
 - ◆ Bigger model ≠ Better model

Common Technical Pitfalls

- Using OR/MS when it's not necessary
 - ◆ Sets a bad precedence for future OR/MS projects
- Engaging or hiring an OR/MS practitioner and "just trusting" them
 - ◆ Not holding them accountable to provide the evidence that the model is valid and meaningful

Marketing Pitfalls

Buyer beware!

- Optimization is not always the optimal approach
- Theory does not always mean more rigorous
- Perception that an “off the shelf” solution is the solution

Organizational Pitfalls

- Finding quality OR/MS talent
- Retaining quality OR/MS talent
- Getting started
- Critical mass

Engagement Pitfalls

- Underestimating the importance of basic consulting skills
 - ◆ Listening
 - ◆ Communicating
- Not following through on implementation
- Not following up after implementation

“Common Sense” Pitfalls

- Not leveraging work that has already been performed
 - ◆ Re-inventing the wheel
 - ◆ A key challenge is that a lot of good work does not get published or presented

“Common Sense” Pitfalls

- Software license ≠ ability to model effectively
- Frequently asked question “What’s the best simulation software?”
 - ◆ It’s not about software, it’s about methodology
 - ◆ Analysts can be very dangerous with simulation software, the same way they can be dangerous with statistical software

“Common Sense” Pitfalls

- Not having a specific problem definition
- Working on the wrong problem
- Failure to convince stakeholders that the model is valid
- Taking too much time
- Failure to use the model effectively
 - ◆ The work is not just about building a model
 - ◆ Models are only as good as the decisions they support

Why Health Care Modeling is Challenging Strategies for Successful Projects

- Understand
- Communicate
- Be transparent
- Be as resourceful with imperfect data
- Engage
- Start simple and measure improvement
- Be flexible and generate value along the way