GUROBI OPTIMIZATION | The World's Fastest Solver

Industry Solution Sheet: Healthcare

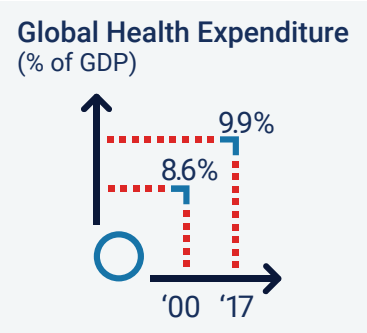
Biarri COMMERCIAL MATHEMATICS

Challenges and Capabilities

Now more than ever, healthcare providers play a critical role in society: They are responsible for safeguarding the health of their communities by delivering high-quality services – in the most efficient manner possible – to patients.

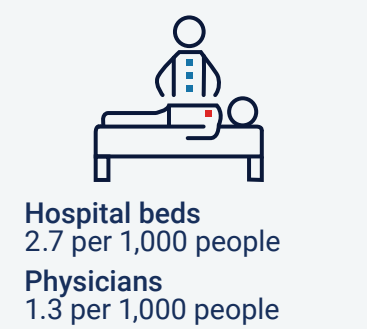
The fundamental challenge for healthcare providers is ensuring the timely resolution of patients' healthcare issues while:

- Minimizing operating costs.



Source: The World Bank

- Maximizing the utilization of their limited resources (such as facilities, equipment, and staff) as well as their employee satisfaction and retention.



Source: The World Bank

- Managing the complexity of healthcare operations.

To simultaneously achieve these business objectives, healthcare providers need to have access to a complete set of cutting-edge advanced analytics tools – and mathematical optimization is one of these tools.

Indeed, an increasing number of healthcare providers – including public and private hospitals as well as GPs and providers of pathology, health insurance, and community care services – are using mathematical optimization technologies in an expanding array of applications to:

- Automatically generate optimal plans and schedules – which can be used by senior-level executives, managers and planners, as well as frontline staff to make optimal, data-driven decisions that boost performance, productivity, and profitability.
- Route patients and allocate resources across their end-to-end network in the most efficient manner possible.
- Optimize their operations – so that they can deliver the best services and outcomes for patients, drive down costs, create a positive and productive work environment for employees, and cope with the complexity of the healthcare industry environment.

With mathematical optimization, healthcare providers can ensure the timely resolution of healthcare issues for patients, improve resource utilization and employee satisfaction, and reduce operating costs – so that they safeguard the health of society as well as the sustainability of the healthcare system.

Gurobi Optimization in collaboration with Dr. Evan Shellshear, Head of Analytics at Biarri

GUROBI OPTIMIZATION | The World's Fastest Solver

Biarri COMMERCIAL MATHEMATICS

Industry Solution Sheet: Healthcare

Opportunities for Optimization

Mathematical optimization technologies are used by leading healthcare providers today to optimize many different strategic, tactical, and operational planning and decision-making processes across their end-to-end operations including:

- List and Theater Scheduling
- Staff Scheduling and Rostering
- Pathology and Patient Routing
- Hospital Capacity Planning and Network Flow
- Integrated Community Care Planning
- Outpatient Appointment Optimization
- Personalized Health Insurance Recommendation
- Manpower and Infrastructure Planning
- Strategic Capital Investment Planning
- Organ Donation Matching
- Medical Equipment Inventory Management

Business Benefits

Healthcare providers utilizing mathematical optimization technologies to manage their operations are able to realize numerous business benefits including:

- Improved operational efficiency and overall profitability
- Increased timeliness and effectiveness of services delivered to patients
- Optimal allocation and utilization of critical resources including staff, operating theaters, ambulances and beds
- Better decision making
- Better patient outcomes
- Higher levels of employee satisfaction and retention
- Improved compliance with government KPIs
- Reduced operating costs
- Better returns on investment

Example Customers

Here is a selection of Gurobi customers that use mathematical optimization to revolutionize their end-to-end healthcare operations:

Townsville Hospital and Health Service
Queensland Government

Queensway Carleton Hospital Foundation

SA PATHOLOGY

PHC primary health care

mater

NSW GOVERNMENT Health