

# Surviving the Global Healthcare Perfect Storm

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## Introduction

While healthcare systems among the developed nations of the world differ widely, they all are facing a common challenge: how to improve care quality and outcomes while reducing costs.

The imperative to control and pare expenses is taking center stage in many countries as the financial foundations for care delivery are deteriorating rapidly and costs continue to spiral.

According to World Bank figures, public expenditure on healthcare in the European Union (EU) could jump from 8% of GDP in 2000 to 14% in 2030.

These projected annual rates of cost increases are unsustainable and they're quickly reaching a breaking point for all nations. As demand for healthcare services increase along with expenditures more attention is finally being placed on operational planning and capacity management.

By applying proven operational planning and capacity management methods healthcare organizations will be able to do more with less, increase utilization and occupancy of current facilities, better utilize and align staffing resources according to patients' clinical requirements, and improve patient throughput.

The end result? Better patient care, more revenue and lower costs.

All countries --- whether they have excess healthcare capacity (such as the U.S.) or constrained healthcare capacity (such as EU and other nations with universal, publicly funded care) --- lack production planning and capacity management capabilities that are well established and well documented in other industries.

Healthcare today needs to shift its focus, much like it shifted its focus after **Abraham Flexner** considered one of America's foremost medical scholars, wrote *The Flexner Report* in 1910. The report changed the course of healthcare in America by insisting that medical education in the U.S.

move to more advanced, scientifically grounded principles.

Global Healthcare Comparison							
Country Rankings							
1.00-2.33	AUS	CAN	GER	NETH	NZ	UK	US
2.34-4.66							
4.67-7.00							
<b>OVERALL RANKING (2010)</b>	3	6	4	1	5	2	7
<b>Quality Care</b>	4	7	5	2	1	3	6
Effective Care	2	7	6	3	5	1	4
Safe Care	6	5	3	1	4	2	7
Coordinated Care	4	5	7	2	1	3	6
Patient-Centered Care	2	5	3	6	1	7	4
<b>Access</b>	6.5	5	3	1	4	2	6.5
Cost-Related Problem	6	3.5	3.5	2	5	1	7
Timeliness of Care	6	7	2	1	3	4	5
<b>Efficiency</b>	2	6	5	3	4	1	7
<b>Equity</b>	4	5	3	1	6	2	7
<b>Long, Healthy, Productive Lives</b>	1	2	3	4	5	6	7
<b>Health Expenditures/Capita, 2007</b>	\$3,357	\$3,895	\$3,588	\$3,837*	\$2,454	\$2,992	\$7,290

Note: \* Estimate. Expenditures shown in \$US PPP (purchasing power parity).  
Source: Calculated by The Commonwealth Fund based on 2007 International Health Policy Survey; 2008 International Health Policy Survey of Sicker Adults; 2009 International Health Policy Survey of Primary Care Physicians; Commonwealth Fund Commission on a High Performance Health System National Scorecard; and Organization for Economic Cooperation and Development, OECD Health Data, 2009 (Paris: OECD, Nov. 2009).

Healthcare spending in the U.S. is projected to grow at an annual average rate of 5.8% through 2020, when spending is projected to be 19.8% of GDP, nearly one-fifth of economic output.

Moving forward, healthcare organizations throughout the world require more evidence-driven, scientifically grounded solutions that can:

- Apply management methods and techniques to predict patient demand so that facilities and staff can be planned and managed proactively, and facility utilization and staff productivity increased.
- Measure, track and forecast patient demand in real time so that resources and workload can be aligned to improve care and patient outcomes.
- Predict and plan for upcoming patient admissions.
- Anticipate and resolve capacity constraints and bottlenecks, and improve bed turnaround in order to facilitate patient throughput.
- Deliver safe, patient-centric care while reducing length of stay.

This paper will:

- Examine how capacity management and production planning can solve critical operational challenges facing healthcare organizations in the U.S. and throughout the world.
- Introduce foundational concepts of capacity management and systems planning.
- Outline the principles of improving operational outcomes in healthcare and highlight how some leading companies in industries outside of healthcare are leveraging them to succeed.
- Provide examples of how various healthcare organizations are integrating capacity management and production planning methods to improve care delivery while reducing costs.

## **The U.S. healthcare marketplace**

Driven by free-market competition the U.S. healthcare system has been designed to generate excess capacity. While surplus capacity improves access to care, it also greatly contributes to America's escalating medical costs.

As **Donald Berwick, MD, MPP**, former Administrator, Centers for Medicare & Medicaid Services, Department of Health and Human Services, said recently:

*“Please don't put your faith in market forces. It's a popular idea that Adam Smith's invisible hand would do a better job of designing care than leaders with plans can. I find little evidence that market forces relying on consumers choosing among an array of products, with competitors fighting it out, leads to the healthcare system you want and need. In the US, competition is a major reason for our duplicative, supply driven, fragmented care system.”*

He argues that purposely providing an inadequate supply of healthcare — as Britain's healthcare system does — is superior to allowing the market to provide an excess.

*“In America, the best predictor of cost is supply; the more we make, the more we use — hospital beds, consultancy services, procedures, diagnostic tests.”*

It's estimated by the Centers for Medicare and Medicaid Services (CMS) that as much as much as \$700 billion of health care spending per year in the U.S., 5% of the nation's GDP, is wasted on tests and procedures that do not improve health outcomes.

At the same time, labor costs comprise approximately 60% of a hospital's total expenses. By operating at a higher level of capacity, hospitals can improve staff utilization and productivity, and significantly reduce unnecessary expenses because of overstaffing.

Unused capacity also translates into many missed opportunities to generate revenue and drive margin improvement. Most U.S. hospitals operate below 80% occupancy. According to Thomson Reuters Source Book 2009, acute care occupancy in US Hospitals was less than 60% in 2007 and 2008. To remain financially viable amid growing pricing and reimbursement pressures, healthcare organizations must optimize capacity utilization.

Governmental and private-sector efforts to reform healthcare will place additional expectations on healthcare organizations to improve operational efficiency. New performance and value-based payment structures will require providers to better manage their existing human, material and capital resources as they sharpen their focus on quality and safety.

To explore better ways of delivering community-based care, a growing number of healthcare organizations, physician groups and payers are collaborating along shared incentives to establish highly coordinated delivery models.

As care delivery becomes more integrated to counteract rising costs and population health and disease management initiatives increase, healthcare organizations need intelligent systems that can better predict, monitor and manage patient-centric demand, and precisely and efficiently align healthcare services to meet those requirements.

### **EU nations and other countries with universal, single-payer, publicly funded care**

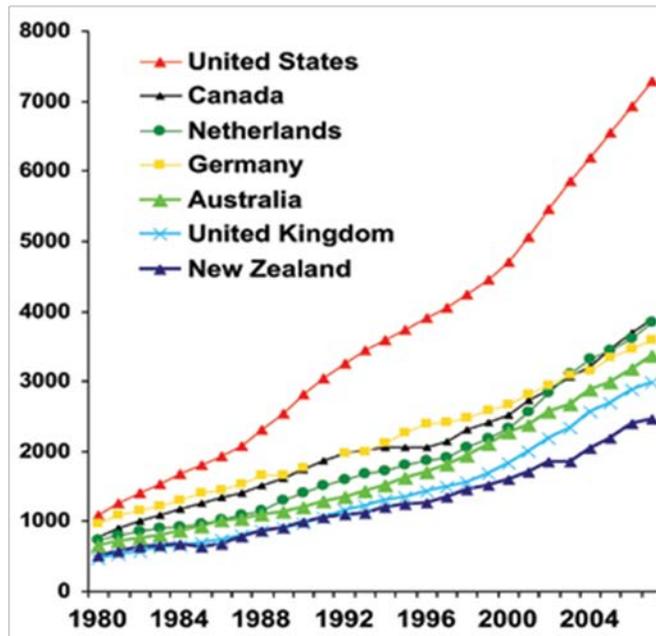
All industrialized nations, with the exception of the United States, implement some form of universal health care.

And while healthcare quality frequently measures higher in these nations than in America, the high costs of providing universal care generally constrains capacity.

Across Europe, for example, the cost of national healthcare continues to outstrip economic growth and shows no signs of slowing down.

Even in countries where governments are intervening to more aggressively negotiate prices, expenses are predicted to rise.

**International Comparison of Spending on Health, 1980–2007**  
Average spending on health per capita (\$US PPP)



\$US PPP = purchasing power parity.  
Source: Organization for Economic Cooperation and Development, *OECD Health Data, 2009* (Paris: OECD, Nov. 2009).

Skyrocketing costs and capacity constraints are lengthening waiting times for care. Recent figures show that among the approximately 2.6 million patients in England waiting for treatment at any time, almost 250,000 or nearly 10% do not get treated within the 18 weeks guaranteed in the National Health Services constitution.

As a result, the NHS is placing greater pressure on hospitals in Great Britain to deliver more timely treatment. These expectations are compelling hospitals to find new ways to improve patient throughput and optimize the use of facilities and staff.

Constrained capacity presents many problems for hospitals. Access to care is compromised when patients are diverted from a hospital's ED because of bed shortages. Lack of capacity prevents hospitals from accepting referrals or direct patient admissions from physicians. Care

delivery is inefficient and fragmented because patients often have to wait longer to receive care, tests and examinations are delayed, and patients are placed on floors or units where they don't belong due to slow bed turnover.

These delays and bottlenecks result in unnecessary increases in patient length-of-stay, reduce quality of care, curtail hospital revenue, and decrease patient and practitioner satisfaction.

Despite these difficulties, most countries offering universal care don't have a scientific, evidence-based way of managing and increasing capacity, although single payer systems make it possible to perform such analyses at regional and national levels.

By employing proven capacity management and production planning capabilities, countries can better plan for and satisfy patient demand, improve patient throughput and provide care proactively and efficiently to the benefit of patients and caregivers.

## **Capacity management and production planning**

A key principle of capacity management and production planning is that if demand can be measured, it can be planned for.

Measurement of demand and capacity is fundamental to understanding how well a healthcare organization is performing, both clinically and financially. The mismatch or variation in capacity and demand is a fundamental reason why bed blockages and medical errors occur, waiting lists and backlogs develop, and elective surgeries are cancelled.

In contrast, accurately aligning capacity with demand supports quality of care, patient safety, staff productivity and efficiency because the right number and type of skilled caregivers and physical resources are available to meet patients' specific clinical needs and drive positive outcomes.

Capacity planning also involves assigning priority to some patients and reserving capacity in advance for very ill patients, and anticipating seasonal and event-driven variations in demand.

Forecasting, tracking and managing demand are important components of overall capacity planning.

Capacity management and production planning are scientific and evidenced-based methodologies. Too many healthcare organizations are planning based on abstract, intuitive and subjective estimates. Aggregate planning and local control are imperative if hospitals are to deliver patient-centric care and plan services across regions with multiple facilities.

The key is having one version of the truth across the whole organization and gaining trust in forward forecasts. From there, it's essential to start planning to the forecast and over time focus on optimizing the system. Organizations will then realize that by understanding variations within the system, they can develop the right capacity and resources to meet the timely needs for their patients.

### **Concepts of demand and variation**

Research has explored some of the capacity and demand variation issues across Great Britain's National Health Service (Walley et. al 2006), suggesting that more capacity is not necessarily the answer to waits and delays for care, and that the lack of bed availability is, from the author's perspective, more a symptom of significant planning defects and system design issues.

Learning from other industries, healthcare can build on some concepts that can significantly help leaders better understand and manage the flow of patients throughout hospital systems.

### **Two key opportunities come to the forefront:**

- **Approach healthcare processes as one system.**
- **Leverage production planning theory, in place since the early 20th century, in healthcare.**

### **Production planning and system thinking**

Production planning has long been associated with manufacturing as a central way to improve operational efficiency, quality and outputs. Competitive pressures, financial targets and resource constraints force the manufacturing industry to continually refine and adjust its production processes to optimize output in line with customer demand, while maintaining profit margins.

Though fundamentally different in many respects, the global healthcare sector faces similar pressures in its control and allocation of resources. In Health Operations Management, Vissers (2005) notes these pressures include:

- *The need for efficient utilization of resources and reduction of costs, (in part) due to the political forces to control national healthcare expenditure.*
- *Mounting demands to improve the quality of medical service by, among other things, decreasing waiting lists and in-process waiting times.*
- *Calls to control the workload of nursing staff and other personnel in order to avoid excessive burdens because of under-staffing.*

The nature of hospitals accentuates these challenges. The demand for different departmental services and the roles, responsibilities and agendas of the individuals involved in providing services combine to add significant complexity to the task of production planning. However, at its most simplistic level, the core areas of focus for production planning in hospitals can be drilled down to demand management and effective resource planning.

In essence, it's essential to ensure that a patient can:

- (a) Be cared for by the right physicians and nurses (workforce planning),
- (b) Be accommodated for in the right facility (capacity management)
- (c) Have appropriate material available. (supply chain management)

In today's financially strained global healthcare environment, limited healthcare funds force

hospital managers to maximize allocation and deployment of available resources. Combine this situation with ever-increasing demand for services and it's easy to see why healthcare providers are failing to improve system performance and increase quality of care while meeting financial targets.

Providing an additional perspective, Samson & Terziovski (1999), define operations management as the planning, organizing, coordinating and controlling of inputs to outputs. In a hospital context, this can be defined as the planning, organizing, coordinating and controlling of safe and orderly patient experience.

The issues and dynamics described are not limited to any particular area of the world. They are pertinent globally, requiring healthcare systems across the continents to develop new ways of managing their core business requirements.

All these trends are beneficial to some extent as they force healthcare organizations to think differently about how they can provide high quality care within budget and in a timely manner. Even so, effectively operating a healthcare organization to meet the demand for services also requires a better understanding of the dynamics of patient flow, and the effect of one part of the system on another.

Rechel et al (2010) carried out a review of international practice and found that healthcare revenue in most developed countries is funded through measures of activity, such as diagnostic related groups (DRG). However, hospital capacity planning remains dominated by bed numbers, the preferred unit of measurement for capacity planning in Finland, Germany, Italy, New Zealand and most Canadian provinces.

Of the countries within their review, they found that only France and the UK have used the measure for capacity planning based on service volume and activity. The most predominant metrics for hospital planning remain bed occupancy and number of beds per population (Rechel et al 2010). If these metrics are considered in relation to demand for healthcare services, a number of problems can be identified. Bed numbers and occupancy do not

provide a good measure of the services provided inside hospitals, as a result of the wide variation of case mix and the treatment costs of those occupying the beds.

This metric is also unsuitable for predicting future demand. The metric implies that the bed is a core piece of capital stock in the hospital, constraining the performance of the other assets around it. The ever-growing number of day cases and the shorter lengths of stay further invalidate beds as a measure of capacity. Rechel et al (2010) argue that DRGs can also be eliminated as an appropriate measure for capacity planning.

DRGs are useful for the pricing of treatments and admissions collectively for categorizing volumes. They say very little of the multitude of resources required to provide the services that are needed.

It's important to consider how other industries have dealt with production and capacity planning, and examine how they can be applied into health systems. If hospitals are to implement production planning, it's critical to understand the true demand for healthcare services and the effects of variation on both the demand and the capacity to provide services.

Examining operational profiles of companies in retail, manufacturing, distribution and supply chain management and services can offer insights into how many of these operational capabilities can be leveraged in healthcare ----- to more accurately meet patient demand with safe and high-quality care, exactly when it's needed.

All these high-performing businesses achieve high levels of operational efficiency and customer satisfaction through their commitment to end-to-end customer service, despite sometimes very significant variations in demand.

## **Seven key principles of effective production planning and operations management**

### **1. Common mission and 2. Decentralized operations management with an aggregated view**

McDonald's Corporation is the world's largest chain of hamburger fast food restaurants, serving around 64 million customers daily in 119 countries. With more than 31,000 restaurants worldwide, McDonald's has developed a method of aggregated regionalism for integrating its restaurants along a common mission on product quality and meeting the demand of their customers.

In 2004, McDonald's introduced a specialized central stock management function known as the restaurant supply planning department. This department is responsible for communicating with individual managers at the local level to identify local events. This information is factored into the company's planning and forecasting system to help predict future demand of finished menu items.

The company can predict, with high degrees of certainty, customer demand and, as a result, will order the requisite supply of fresh, raw ingredients at its locations. By stocking its stores at optimal levels, McDonald's reduces waste and costs, improves food quality and service to its customers with minimal wait, and fulfills its mission of "one burger worldwide."

### **3. A service flow orientation to supply chain management**

Wal-Mart serves customers and members more than 200 million times per week at more than 9,826 retail units under 60 different banners in 28 countries. With fiscal year 2010 sales of \$405 billion, Wal-Mart is a world leader in retail industry largely due to its continued focus on meeting customer needs and reducing costs through efficient inventory management practices.

The company supports one of the largest private distribution operations in the world. Inside each of its 40 Regional Distribution Centers are more than five miles of conveyor belts continuously moving over 9,000 different lines of merchandise. To improve the flow of inventory from manufacturers to its customers, Wal-Mart has moved from a "supply chain" orientation to a "demand chain" orientation. This means that instead of the retailer "pushing" products into

the system, customers can “pull” products when and where they are needed.

Through immense investments in IT and its own satellite communication system, Wal-Mart can visualize its entire supply chain and, in real time, identify inventory requirements, movements of inventory and any supply issues affecting individual stores. Technicians are available 24/7 to assist individual stores in rectifying any problems across the supply chain. A comprehensive, centralized inventory data system provides employees with up-to-date information so they can take proactive steps to improve inventory flow and ensure products get to consumers quickly.

#### **4. Planning driven by demand**

Philips Consumer Lifestyle is a part of Philips, one of the largest electronics companies in the world. Because Philips Consumer Lifestyle makes over 8,000 products that are sold in hundreds of countries, planning worldwide sales is a complex, ongoing task. To develop an unambiguous, integrated process for its financial and operations planning and achieve the optimal balance between supply and demand, Phillips Consumer Lifestyle Parts significantly streamlined its planning and forecasting process.

Its core strategy is based on the concept that local sales plans (through consumer demand) lead the way. On a monthly basis, the sales side of the organization uses its knowledge of local markets to produce forecasts based on business targets. These forecasts are used as the basis for purchasing and production planning.

Each quarter a snapshot of sales plans are taken, enhanced with a range of financial details, and are incorporated into rolling forecasts. After the forecasts have been discussed with the specific business units and any adjustments made, all of the data is consolidated. The entire process, from snapshot to decision, takes approximately two weeks.

By basing financial planning on operational planning driven by consumer demand, Philips Consumer Lifestyle is able to more effectively meet the needs of its customers.

#### **5. Make it visible**

The Vodafone Group is one of the world's largest mobile communications companies, with equity interests in more than 30 countries across five continents. Vodafone UK was recently presented with many operational problems. Because its staff worked on fixed shifts, the company was highly vulnerable to changes in call patterns. In addition, its creditor centers could only dial outbound during very specific periods when the shifts and availability dictated. There was little value in virtual routing, which resulted in low service levels in one center with availability in another. The company also was unable to view how its outsource partners were contributing on an intra-day basis.

To solve these and other issues, Vodafone UK implemented a workforce management system that schedules agents using historical data and reliable forecasts, generated over an eight-week period. The system provides the company with real-time monitoring of available agent resources, and helps it allocate calls internally and throughout its outsourcing partners. New plans can be adjusted with as little as 30 minutes notice in order to account for any marked shortfalls or surpluses in contact center resources. Additional benefits include:

- A reduction in 300 FTEs while improving service levels.
- A drop in average overtime costs from £50k per month to £3k per month.
- Improved adherence from 65% to 95 %.
- Enhanced schedule efficiency.

#### **6. Incremental, not “big bang” improvement**

The Hitachi Seiki Company is a leading manufacturer of machine tools, particularly industrial machinery and manufacturing systems, in Japan.

To succeed and grow, the company reinvented itself from an obscure, slow-moving firm to one of the world's leading suppliers of flexible manufacturing systems, such as computer-controlled equipment able to perform variable sequences of machining tasks.

Hitachi Seiki improved its operational management by taking a systems approach that combines lean manufacturing, just-in-time

production, total quality management and re-engineering principles.

The company recognized that to effectively compete moving forward, it had to pinpoint its failures and inefficiencies, build on its successes, and expand its knowledge of operational management and continual quality improvement.

### 7.) “Let’s Get Closer to the Customer”

Zara International is a Spanish clothing and accessories retailer and flagship chain store of the Inditex group. In its commitment to “get closer to its customers,” Zara follows three operational philosophies:

- Shorter product cycles create more fashionable clothes
- Don’t over produce. Keep quantities lean
- Offer more styles and more choice to satisfy consumer preferences

What sets Zara apart from many of its rivals is that concentration on responding swiftly to fast-emerging market trends. Garment design and production at Zara starts from an email or phone call from its stores pertaining to customer preference. Zara reacts to the immediate needs of its customers rather than solely basing its operations on forecasts that extend up to 12 months, which is the path followed most other clothing manufacturers.

By focusing on short lead times, Zara can quickly ensure they have the right fashion garments in its stores when consumers want them. Zara has developed a system that converts an identified fashion trend into finished, on-the-shelf clothes within 30 days.

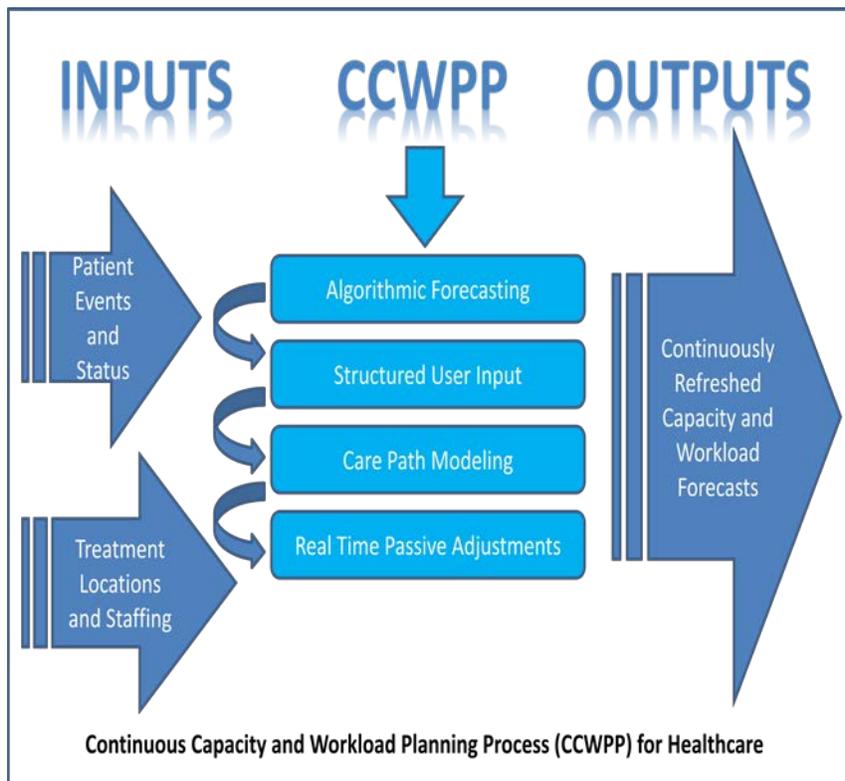
Zara is an ideal example of a company that mixes forecasting of aggregate demand with a nimble, proactive approach in adjusting production according to short-term and

fast-changing market fluctuations and preferences.

### **How can these principles work in a healthcare environment?**

It is easy to dismiss the potential of these principals in a hospital environment by saying that healthcare is too complex or unlike a traditional business. A Continuous Capacity and Workforce Planning Process (CCWPP) in a hospital is clearly affected by the data elements available to define demand and the standards and clinical protocols used to translate the demand triggers into a capacity and workload forecast.

In a clinical environment a continuous planning system uses information about patient events (scheduled and unscheduled) to power a continuous planning process. Using electronic interfaces to capture clinical events like OR bookings, ER arrivals, and Inpatient registrations, along with other patient flow milestones, long range forecasts, mid range



updates and real time passive projections are made visible to clinical leaders. These views of

the future take the form of workforce needs by location, skill and hour, as well as patient capacity levels. A well rounded continuous planning tool kit employs statistical algorithms, structured end user input, care pathway modeling and real-time passive adjustments in order to deliver views of the future.

A continuous planning approach also, helps elevate the clinical leader's performance in making long term (annual), mid-term (scheduling), near term (pay period), and real time (hour by hour) resource allocation and capacity management decisions. Furthermore a mature continuous planning system will use patient intake triggers like OR bookings to project related impacts in departments along the care continuum (intake to discharge), truly a systems approach.

A Continuous Planning System does more than just provide raw data to decision makers. Converting the raw data into resource needs (capacity and workforce) and delivering information to decision makers at the right time and without excessive end user involvement is what forms the tipping point for adoption and significant performance improvement.

## **How early adopters in healthcare are leveraging production planning and operations management to improve clinical and financial performance**

### **Waikato Hospital**

Waikato District Health Board (WDHB) is responsible for planning, funding and providing quality health and disability support services for the 365,730 people living in the Waikato region of New Zealand's North Island. Within the WDHB is Waikato Hospital, a 600-bed teaching hospital based in the city of Hamilton, New Zealand.

Like many other hospitals, Waikato DHB historically had difficulty understanding their patient demand and did not have a clear link between their planning processes and the daily

operational management of the hospital. As a result, the hospital traditionally misaligned supply and demand, creating bed blockages, long waits for the ED beds and cancellation of elective surgeries.

After introducing structured, continuous planning tools, Waikato DHB significantly improved operational and capacity management results. These planning tools capture information about patient events (scheduled and unscheduled), such as OR bookings, ER arrivals and Inpatient registrations, along with other patient flow milestones, long range forecasts and mid-range updates to assess workforce needs by location, skill and hour, as well as patient capacity levels.

By converting the raw data into resource needs (capacity and workforce) and delivering information to clinical decision makers at the right time, Waikato Hospital has improved its clinical operations and moved from a reactive to proactive mode in providing appropriate levels of staffing care.

Waikato Hospital now accurately predicts both supply and demand over the next 24, 48 and 72 hours, enabling it to deliver care in an organized, well planned and safe manner.

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### **Australia's Royal Adelaide Hospital (RAH)**

Australia's Royal Adelaide Hospital (RAH) manages over 650 beds, 3,000 staff members and 61,000 emergency admissions a year.

Faced with increasing demand for its medical services, high occupancy and significant cost constraints, RAH in 2004 decided to implement a change improvement strategy called Patient Pathways.

To support Patient Pathways ----- which was aimed at enhancing the patient experience and improving capacity within existing resources ---- - the hospital selected a capacity management tool to more accurately forecast staffing requirements, facilitate patient flow and increase bed capacity. Soon after the implementation of the capacity management system in July 2007, RAH began identifying many key operational improvements within its facility.

While it's difficult to contribute all of these improvements to the new system, there is strong evidence that the solution saved up to \$600k to \$1.1m in the first year to May 2008, and an additional \$1.8m to \$2.5m in the second year to May 2009.

In addition, the hospital's clinical operations have improved significantly due to a unified access view of operational status, the ability to identify specific demand trends, the availability of real-time supply and demand data, and a more proactive approach to care management.

Specific benefits reported included:

- An increase in cross-hospital awareness and uptake of patient flow opportunities.
- A more accurate alignment of required beds and patient demand per unit.
- Greater staff satisfaction despite increased occupancy levels.
- Improved matching of elective surgery strategies and inpatient activity.
- More efficient resource and bed matching during periods of special events, such as Christmas and during winter periods.

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### **Canterbury District Health Board (CDHB)**

Canterbury District Health Board (CDHB) , one of the largest public health providers in New Zealand, is viewed as a leader in patient flow initiatives, with its flagship "Improving the Patient Journey" attracting interest domestically and internationally. Like most publicly funded providers, however, it faces the challenges of meeting growing demand within significant fiscal constraints.

CDHB's operational challenges included:

- A reactive approach to meeting daily staffing demands.
- Anecdotal and subjective data on supply and demand.
- Limited understanding of capacity management techniques.
- Lack of tools to support real-time decision-making.

By integrating a capacity management system, CDHB dramatically improved operational results, including:

- A cost savings in the first year of implementation in excess of \$NZ 0.5 million, solely based on more effectively planning Christmas, New Year and Easter.
- A reduction in ED overcrowding events by more than 50%, and a substantial reduction in gridlock events despite increases in inpatient bed days.
- Safer patient care by better aligning staffing resources with patient demand.
- Improvements in patient safety through more consistent staffing rates.
- Better management of annual leave and study/conference leave situations.
- Comprehensive operational management. CDHB can view the operational performance, real-time status and capacity projections for two hospitals in the same city and one hospital 87 kms away.
- More effective decision making among planners, heads of departments, front line staff and executives.

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### **Northampton General Hospital (NGH) NHS Trust**

England's Northampton General Hospital NHS Trust provides a full range of acute clinical services from its Northampton General Hospital and Danetre Hospital in Daventry. It also manages community beds at Danetre Hospital, Isebrook Hospital in Wellingborough, and Corby Community Hospital.

NGH's operational challenges included:

- Inability to accurately forecast and effectively manage inpatient bed requirements, resulting in hospital-wide inefficiencies.
- Above-target temporary agency staff expenses and imbalanced staffing.
- Lack of effective bed management.

After incorporating a capacity planning, forecasting and services solution, NGH:

- Effectively matched its winter forecast and associated Christmas bed plan with forecasted staffing resources. As a result, more staff could take their annual leave while needs for agency staff reduced.
- Achieved potential efficiency savings of approximately £690k in the first year of implementation, by aligning resourced bed requirements to peak expected demand.
- Gained accurate data on current status, opportunities and recommendations across all inpatient areas of the hospital.
- Developed models highlighting the impact of patient flow improvements in financial and resource management terms.
- Fine-tuned bed requirements for each speciality.

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### **Bedford Hospital NHS Trust**

Bedford Hospital NHS Trust is a 450-bed District General Hospital within the East of England Strategic Health Authority region.

The hospital's operational challenges included:

- Recurrent financial of some £12 million.
- Fixed capacity and rigid staffing patterns despite variations in demand.
- Frequent bed "gridlock" situations.
- Declining length-of-stay indicators.
- Lack of access to timely and accurate operational data.

By implementing a capacity management system, Bedford Hospital integrated daily, weekly and event planning into its operations, resulting in:

- Averaging annual savings of approximately £300k per year in inpatient areas alone, without a reduction in care standards.
- A 50% reduction in patients hospitalized longer than 10 days.
- Staffing according to evidence-based workload indicators.
- Access to real-time operational data.

Capacity management enabled the hospital to use aggregate demand forecasting to identify true future capacity. In addition, the hospital is able to monitor actual, short-term demand and make short-term adjustments in capacity allocation to maintain safe staffing levels and manage costs.

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### **Vancouver Coast Health**

With more than 23,000 employees and seven hospitals, Vancouver Coast Health, Vancouver, BC, Canada offers a full continuum of medical services including residential care, ambulatory care, mental health services, and palliative care to residents of British Columbia's Central Coast.

By implementing a workforce optimization initiative, Vancouver Coastal Health significantly reduced overtime in its acute care settings, enabling it to:

- Avoid having to hire an additional 600 full-time employees per year over three years.
- Save between \$30 million and \$60 million in annual labor expenses.
- Improve volume between 2 and 3% per year.

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### **Counties Manukau District Health Board (CMDHB)**

Counties Manukau District Health Board (CMDHB) is responsible for the funding of health and disability services and for the provision of hospital and related services for the people of Counties Manukau (Manukau City, and Franklin and Papakura Districts) in New Zealand.

To gain centralized control over patient demand, CMDHB has introduced "Middlemore Central," which provides real-time, aggregated data across a range of operational, clinical and administrative indicators as well as forecasting information at its flagship healthcare facility, Middlemore Hospital

Having integrated and centralized operational data enables hospital decision-makers to

pinpoint potential supply and demand problems in advance, and ensures that all staffing decisions incorporate the impact of real-time supply and demand dynamics.

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### **Flinders Medical Centre (FMC)**

Recognized as one of Australia's finest public teaching and research hospitals, Flinders Medical Centre (FMC) is a 580 bed public teaching hospital in Adelaide, South Australia.

To improve patient flow, FMC has initiated a patient-focused "pull" system, which is focused on streaming patient demand in ED based on the likelihood of admissions. In addition, the hospital's "bed ahead" process provides sufficient downstream bed capacity for the actual ED admissions.

### **In Conclusion**

The pressure to improve healthcare outcomes while reducing expenses has forced healthcare organizations to look for new ways to better allocate and deploy their existing facilities and staffing resources to satisfy patient demand requirements.

While the healthcare industry lags behind manufacturing and other industries in production planning and demand management methodologies, a growing number of healthcare organizations are putting these methodologies into practice through new capacity management tools and technologies.

By doing so, these organizations are achieving measurable improvements in key healthcare operational indicators: care quality, patient safety, patient throughput, cost control, and staff productivity and satisfaction.

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