Addendum: The nine forces changing the world for hospitals

This addendum, a companion to ‘The hospital is dead, long live the hospital: Innovations that will shape the next generation of hospitals’, provides greater details about the forces reshaping healthcare delivery.

By Dr. Penny Dash, Caroline Henricson, Dr. Pooja Kumar, and Natasha Stern

May 2019
In our article, ‘The hospital is dead, long live the hospital: The innovations that will shape the next generation of hospitals’, we briefly discuss the nine major forces affecting hospitals:

- The patient population is getting older, and their needs are becoming more complex
- Patients have far higher expectations than before
- Recognition is increasing that care is better provided in community settings
- High-quality care requires concentration into specialised, high-volume centres of excellence
- Clinical advances are delivering better quality and outcomes
- Digital technologies have begun to affect how healthcare is delivered and have the potential for disruptive change
- Availability and expectations of the healthcare workforce are changing
- Payers find it increasingly difficult to finance healthcare in line with increasing costs—which puts pressure on hospitals to deliver high-quality care more affordably
- There are more requirements to measure and publish quality metrics and to receive financial bonuses for high-quality care

Here, we explore each of these forces in greater detail. Whilst their relative importance differs from country to country, the forces are currently at play across the globe.

The patient population is getting older, and their needs are becoming more complex

Partly because of the major advances in healthcare that occurred over the past century, the population that hospitals serve today looks fundamentally different than it had in previous decades: patients are far older and have more complex needs.

Prognoses following cancer diagnoses, heart attacks, and strokes have improved markedly, but patients often require significant care after discharge. For example, 40 percent of stroke survivors require support with daily activities after being discharged from hospital. The proportion of patients in the United Kingdom with more than one long-term condition increased from 32 percent in 2002 to 43 percent in 2012. The cost of care is up to eight times higher for these patients than for healthy adults. Mental health remains an unresolved challenge, affecting one in four people worldwide at some point in their lives.

The changing population presents new challenges to hospitals, which must develop and expand services to accommodate older, more complex patients. In addition, demand for care in the community is rising—in most European countries, the number of beds in care homes has increased. In the Netherlands, for example, the number of beds providing nursing or residential care rose from 168,847 in 2000 to 222,310 in 2015. Last, managing the growing need for medical care delivered in the community creates new challenges—both increasing age and the total number of medications have been correlated with a rise in the frequency of primary care attendances.

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Patients have far higher expectations than before

Patients—and their families and caregivers—are increasingly acting as consumers, a phenomenon resulting from:

- Easier patient access to information and technology
- Growth in the share of costs paid directly by patients in some countries, including the United States (Exhibit 1) and the BRICS countries (Brazil, Russia, India, China, and South Africa)
- The rise of ‘retail’ models of healthcare

The trend towards consumerism reflects developments in other industries, where ease of use and price are key differentiating features between suppliers. In addition, price and quality comparison websites have become increasingly critical info mediaries.

Patients expect to receive more information and have greater involvement in decisions surrounding their care, and a growing number of them are demanding higher standards and access to the newest treatments.

Providers around the world recognise this trend; in a recent international survey, 82 percent of providers identified patient experience as one their top three priorities for the next three years.

Efforts to improve patient experience have been undertaken in many parts of the world. For example, NephroPlus, India’s largest dialysis network, provides a single point of contact for dialysis users to help them arrange holidays (including travel, hotels, and dialysis).

In addition, all dialysis centres in the network provide free Wi-Fi and television access during patients’ four-hour dialysis sessions.

Exhibit 1
Consumers’ share of healthcare costs have risen dramatically

<table>
<thead>
<tr>
<th>Employee-paid portion of premiums¹</th>
<th>Deductibles²</th>
<th>Co-payments for physician office visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ per employee, family coverage</td>
<td>$ per employee, in-network services for individual coverage</td>
<td>% of covered members</td>
</tr>
<tr>
<td>1,788</td>
<td>201</td>
<td>Decreasing</td>
</tr>
<tr>
<td>5,547</td>
<td>1,353</td>
<td>Increasing</td>
</tr>
<tr>
<td>+210%</td>
<td>+537%</td>
<td></td>
</tr>
</tbody>
</table>

¹ All plans and company sizes, for family coverage.
² For preferred provider organization plans; other types of plans have seen similar increases. Figures may not sum to 100%, because of rounding.

Source: Kaiser Family Foundation, 2001 and 2018 Employer Health Benefits Surveys

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Recognition is increasing that care is better provided in community settings

Current evidence suggests that it is beneficial for patients if their care is managed outside of hospitals whenever possible. Better primary preventive care for patients with long-term conditions reduces complications and the need for hospital care.\(^{17}\) Early discharge following surgery can often be achieved without increasing the risk of complications and may improve patient satisfaction.\(^{18}\) Furthermore, longer stays in hospital lead to a significant loss of muscle strength\(^{19}\) and, as such, may increase dependency—especially for older patients. One study found that older people can lose up to 5 percent of muscle strength per day of hospitalization.\(^{20}\) Kaiser Permanente’s affiliated medical groups, such as The Permanente Medical Group in Northern California, consider any excess length of hospital stay to be a safety issue and monitor this metric closely.

At the same time, clinical advances permit more to be done in outpatient settings, a trend that is highly likely to continue. In a McKinsey survey, practicing US physicians predicted that 28 percent of total knee replacement surgeries will be performed in outpatient settings within 10 years (about 2 percent of those procedures are currently done on an outpatient basis in the United States).\(^{21}\) The total value of US Medicare payments for outpatient cardiology treatments exceeded those for inpatient care for the first time in 2014. A further 15 percent shift in activity is expected over the next ten years.\(^{22}\)

In China, online healthcare platforms are emerging, steering patient volumes away from hospitals. One investment-holding conglomerate has invested in an online care delivery system called WeDoctor (formerly known as Guahao). WeDoctor has more than 27 million active users monthly, which it serves via 2,700 hospitals, 220,000 doctors, and 15,000 pharmacies.\(^{23}\) In addition, the major Chinese insurer Ping An owns a system called Good Doctor. Both platforms have the intention of moving volumes away from inpatient care towards online and outpatient settings.

In many countries, publicly funded healthcare systems are also encouraging providers to reduce dependence on hospital settings. Israel, for example, the bed count (excluding psychiatric beds) per 1,000 population is currently only 1.8, amongst the lowest in the developed world, but it is projected to fall to 1.6 over the next few years. Although the country’s population is expected to grow by 2 percent during that time, the ministry of health has made it challenging for hospitals to increase bed capacity, based on the beliefs that hospitals will always fill the capacity they have, and that, at the system level, it is better to invest in community healthcare than larger hospital capacity.\(^{24}\)

The trend towards increasing outpatient care is reflected in the growth of free-standing retail clinics or urgent care centres in the Australia, the United Kingdom, and the United States (Exhibit 2). However, growth has been slower in Australia than in the other countries.

Traditional inpatient healthcare providers—that is, hospitals—must respond to these trends towards shorter hospital stays, or they may be left with substantial underutilization of their large fixed-cost bases.


\(^{22}\) Jourdan A. Tencent’s WeDoctor raises $500 million, values firm at $5.5 billion pre-IPO. Reuters. May 8, 2018.

\(^{23}\) McKinsey interviews with Israeli healthcare officials.
High-quality care requires concentration into specialised, high-volume centres of excellence

A substantial body of evidence shows that the volume of activity is positively correlated with patient outcomes. This relationship has been established in many areas of planned care—including joint replacement surgery, cataract surgery, paediatric surgery, and cancer surgery—as well as in acute care (e.g., for major trauma, strokes, and heart attacks). Many hospitals must now show that they can maintain sufficient volumes or risk losing more complex cases, or even whole service lines, to more specialised centres (Exhibit 3).

In some cases, a result of this understanding (that the volume of procedures performed in the same location and/or by the same clinician can deliver better quality and better efficiency) is the disintermediation of general hospitals altogether. Especially in Asia, providers which focus on only one specialty are emerging. In India, these providers include Aravind, a specialist eye centre, and Apollo Hospitals, which focuses solely on treatment for coronary heart disease.

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Exhibit 2
Rise of new ambulatory options has shifted care from inpatient to outpatient settings

<table>
<thead>
<tr>
<th>Approximate number of US centres, thousands</th>
<th>Approximate number of visits,¹ millions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urgent care</strong></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>6.1</td>
</tr>
<tr>
<td>2015</td>
<td>6.9</td>
</tr>
<tr>
<td>2017</td>
<td>6.1</td>
</tr>
<tr>
<td>+7% p.a.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>79.3</td>
</tr>
<tr>
<td>2015</td>
<td>119.2</td>
</tr>
<tr>
<td>2017</td>
<td>147.8</td>
</tr>
<tr>
<td>+13% p.a.</td>
<td></td>
</tr>
<tr>
<td><strong>Retail clinics</strong></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>1.7</td>
</tr>
<tr>
<td>2015</td>
<td>2.1</td>
</tr>
<tr>
<td>2017</td>
<td>2.2</td>
</tr>
<tr>
<td>+6% p.a.</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>13.4</td>
</tr>
<tr>
<td>2015</td>
<td>17.2</td>
</tr>
<tr>
<td>2017</td>
<td>21.2</td>
</tr>
<tr>
<td>+12% p.a.</td>
<td></td>
</tr>
</tbody>
</table>

¹ Based on average visits per day, number of clinics, and days in the year.

Source: Kalorama Information, Retail Clinics 2017: The Game-Changer in Healthcare; Kalorama Information, Retail Clinics: Customer Survey 2018; UCA Benchmarking Reports (2013–17), Urgent Care Association of America, ucaoa.org

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Clinical advances are delivering better quality and outcomes

Advances in clinical knowledge have led to some truly astonishing achievements. For example, UK deaths from cardiovascular disease fell by 68 percent from 1980 to 2013, even though the prevalence of the disease consistently hovered around 3.5 percent. Similar reductions have been observed in other developed countries. The decrease is attributable to both clinical advances (e.g., surgical interventions that decrease case fatalities, the increased use of statins, the advent of thrombolysis and stenting), as well as reduced smoking rates.

Decreases in mortality and case fatalities from breast cancer are also striking—in the United States, for example, mortality declined by 34 percent from 1975 to 2010. The decreases are attributable not to improved screening but to the introduction of new therapies, such as cyclophosphamide/methotrexate/5-fluorouracil (CMF) and tamoxifen in the 1970s and adjuvant therapy in the 1990s.

For many patients, antiretroviral therapy has converted HIV/AIDS from a deadly disease to a chronic condition. The development of sofosbuvir and other new direct-acting antiviral medications transformed the lives and prognoses of thousands of hepatitis C patients.

Exhibit 3

Higher hospital and surgeon volumes are associated with lower mortality for many conditions, including abdominal aortic aneurysm (AAA) repair

The significant relationship between operating volumes (for both hospitals and surgeons) and outcomes was proved in an analysis of more than 460,000 patients in 51 studies:

- Mean mortality rate for elective AAA repair was 9.5%—but the mortality rate fell as annual operating volume increased
- Hospital volume and surgeon volume are independent predictors of mortality (i.e., higher-volume surgeons have lower operative mortality rates than lower-volume surgeons)
- Furthermore, hospital volume and surgeon volume have an additive effect

Weighted mortality odds ratio for elective repair is 0.66 at a threshold of 43 AAAs per annum

Mortality rate plotted against annual volume of elective AAA repairs by hospital. Dashed line represents the group mean (9.5%)

Weighted mortality odds ratio for ruptured repair is 0.78 at a threshold of 15 AAAs per annum

Mortality rate plotted against annual volume of ruptured AAA repairs by hospital. Dashed line represents the group mean (37.1%)

The potential of drug therapies to cure disease has also risen, in part because of the increasing use of monoclonal antibodies and gene therapy. Precision medicine may eventually help to reduce the cost of care by allowing clinicians to prioritise the therapies that are most likely to be effective in an individual.

However, many of these advances in care are quite expensive, and spending on pharmaceuticals remains a concern for many countries. Drug sales are expected to grow in value by more than 6 percent per annum globally from 2018 to 2022, despite increasing scrutiny on pricing.  

Digital technologies have begun to affect how healthcare is delivered and have the potential for disruptive change

Digital technologies are causing multiple disruptions in care delivery, including a shift to self-service, remote access, and greater transparency. The types and volume of data available, which have the potential to enhance clinical decision-making, are exploding.

Digital technology is affecting healthcare delivery in five principal ways:

- Automating manual tasks to improve the consistency of performance, as well as to allow clinical staff to be more efficient, freeing up more time for patient care. In England, Hospedia has partnered with Derby Teaching Hospitals NHS Foundation Trust as part of Hospedia’s Ready to Go initiative. They developed processes to display a range of icons that allow rapid, real-time tracking of the patient’s status and indicate when he or she is ready for discharge. This automation eliminates the need for staff to check the notes or chase other members of the team to confirm outstanding patient needs.

- Enabling patient and caregivers to play a bigger role by providing greater access to and interactivity with healthcare providers. It is well established that patients who are more involved in clinical decision-making about their health have a faster recovery. Digital technologies are starting to work in this space—Sensely, launched in 2015, is an app that allows patients to maintain a direct connection with their clinical teams by talking to the app and thereby minimising the need for in-person follow-up.

- Allowing real-time management of assets and flows, which can improve throughput in emergency departments. Jackson Health System, based in Miami, Florida, uses Teletracking’s radiofrequency identification tagging to track the utilisation of beds—and hence the movement of patients—in real time, making it easy for the staff to follow changes. With the improved management of flow and staff utilisation, turn time has been reduced by 70 percent, and the average length of hospital stays has been reduced by more than one day.

- Reducing variation in the type and timeliness of care received, which can be aided by applications for real-time decision support. Clinical decision support can increase reliability and robustness as well as improve accessibility. The Mayo Clinic, in Rochester, Minnesota, transitioned from protocols to decision-support algorithms to standardise nurse triage and ensure that key patient assessment points are never missed. As a result, patient access to providers improved by about 10 percent, since about 36 percent of the patients were redirected to a lower level of care than originally expected. Moreover, the decision-support system at Mayo enables a more agile way of working. During the H1N1 outbreak of 2010, when the US Centers for Disease Control frequently changed its recommendations for providers as its under-
Standing of the virus evolved, Mayo was able to maintain standardized care across a large number of care units.43

- Enhancing connectivity between patients and clinicians, no longer requiring them to be co-located. Remote monitoring can facilitate patient care—among multiple units or even multiple hospitals—from a single control centre. This approach is used by the Philips eICU (electronic intensive care unit) system, which also deploys predictive algorithms to assist in patient care. Studies of eICU systems have shown that they can lower mortality and length of stay, decrease the time before intensive care physicians become involved with deteriorating patients, and reduce response times.44 Silver Chain in Australia is piloting a physician-consultation service enabled by 3-D goggles for patients near the end of life. The service is expected to revolutionise patient experience and reduce hospital attendance numbers, cutting care delivery costs in the process.45

Availability and expectations of the healthcare workforce are changing

Workforce costs amount to 50 percent to 70 percent of expenditures in hospitals across the world, our research has shown. And despite automation, a skilled workforce will remain a major part of the resources needed to deliver high-quality care. However, attracting and retaining a skilled clinical workforce is an increasing challenge around the globe.

The global workforce shortage of 7.2 million healthcare workers in 2013 is projected to grow to 12.9 million by 2035.46 Absolute numbers mask further challenges, both geographic and within professions:

- In Europe, the estimated share of physicians aged 55 and over rose from 27 percent in 2005 to 38 percent in 2016 and continues to increase.47

- Growing numbers of newly qualified doctors are exploring alternative career opportunities. In the United Kingdom in 2011, 4.7 percent took a career break or left the profession permanently within two years of qualification48; this figure rose to 13.8 percent in 2017.49

- In some parts of the world, attracting a workforce to rural areas has been challenging and has required incentives. To address the shortage of primary care physicians in rural Australia, for example, the government’s Five Years Overseas Trained Doctors Recruitment Scheme provides incentives to trained doctors from other countries as long as the doctors agree to work in rural areas of Australia; the government also makes it easier for the doctors to remain in that country by halving the ten-year moratorium on obtaining a ‘provider number’ (once overseas-trained doctors have such a number, they can apply for jobs in Australia on a par with those trained within the country).50

There is also a global shortage of nursing and allied health professional staff. Vacancy rates vary from 790 to 1,330 nurses per 100,000 inhabitants in Belgium, France, Germany, the Netherlands, and the United Kingdom.51

There are several reasons why attracting and retaining a skilled clinical workforce is a growing challenge across the world. A significant share of the workforce (e.g., one-third of US nurses) are baby boomers, which means that the supply of experienced workers will decrease once they retire. Furthermore, replacing a workforce also takes time. In the United States, it takes two to four years to become a registered nurse, a four-year Bachelor of

45 Silver Chain website. Silverchain.org.au.
Payers find it increasingly difficult to finance healthcare in line with increasing costs—which puts pressure on hospitals to deliver high-quality care more affordably.

The rise of healthcare spending is expected to continue to exceed the gross domestic product (GDP) growth in the Organisation for Economic Co-operation and Development (OECD) and BRICS countries, as well as many others, because of population aging, higher patient demands, and more advanced treatments and technologies (Exhibit 4). Based on current trends, healthcare spending in the United States may exceed 24 percent of GDP by 2040. By 2060, healthcare and long-term care spending in the European Union and Norway is projected to double from 2007 expenditures and reach 13 percent of GDP.

Many payers globally—be they governments, institutional and private insurers, or individuals—recognize the need to address the growing healthcare demand. Nursing degree and one or two years of additional training to become a nurse practitioner, and nine or more years to become a physician or surgeon. Shortages increase the strain on the workforce, leading to employee overwork and burnout. Attracting students to health profession training programmes has become more challenging, which explains why some hospitals are offering large signing bonuses, college tuition, and free housing to employees and their children.

In many countries, the primary method used to meet the growing demand for healthcare services has been to increase the size of the clinical workforce; there has been little change in the efficiency with which care is delivered. Improving the productivity of care delivery would help address the workforce shortage, but achieving that aim will require significant changes to hospital operations.

Exhibit 4

Healthcare spending is likely to exceed economic growth globally, creating a sustainability challenge for healthcare systems

<table>
<thead>
<tr>
<th>OECD countries</th>
<th>Projected annual GDP growth over next 50 years</th>
<th>Projected annual healthcare spend growth over the next 50 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>2.0</td>
<td>+1.3</td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td>3.3</td>
</tr>
<tr>
<td>France</td>
<td>2.1</td>
<td>+1.6</td>
</tr>
<tr>
<td>Germany</td>
<td>1.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.1</td>
<td>3.3</td>
</tr>
<tr>
<td>China</td>
<td>3.3</td>
<td>5.3</td>
</tr>
<tr>
<td>India</td>
<td>4.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BRICS</th>
<th>Projected annual GDP growth over next 50 years</th>
<th>Projected annual healthcare spend growth over the next 50 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>2.1</td>
<td>3.3</td>
</tr>
<tr>
<td>China</td>
<td>3.3</td>
<td>5.3</td>
</tr>
<tr>
<td>India</td>
<td>4.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

BRICS, Brazil, Russia, India, China, and South Africa; GDP, gross domestic product; OECD, Organisation for Economic Co-operation and Development.


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53 Kavilanz P. Hospitals offer big bonuses, free housing and tuition to recruit nurses. CNN Money. March 8, 2018.
56 Appleby J. Spending on health and social care over the next 50 years: Why think long term? The King’s Fund. 2013.
In Sweden, a 2001 investigation concluded that one of the country’s leading hospitals, Karolinska University Hospital, needed to be updated. However, renovating it would have entailed such high costs and produced such a negative impact on operations that Sweden decided it would be better to build a new hospital. The new hospital, which is now operational, is designed in a modern way so that care delivery can be reorganized to address current patient needs, and advanced technology and scientific research can be accommodated.

There are more requirements to measure and publish quality metrics and to receive financial bonuses for high-quality care

In the past, patients had limited information about the quality of their hospital’s or doctor’s performance. Today, hospitals in Canada, Scandinavia, and the United Kingdom are legally required to publish quality measurements, and financial bonuses are paid to providers that deliver high-quality care. Mortality, readmittance, and infection rates are amongst the quality indicators that must be reported, and some healthcare providers volunteer to include additional information. As more data becomes available, patients will have a greater opportunity to assess the quality of care provided by hospitals, and even doctors, to make decisions regarding where and to whom to go. Patients who previously trusted their local hospital may decide to travel considerable distances for better care, resulting in greater patient volumes at already large hospitals. Increasingly, each hospital must have a distinctive offer to payers and patients if it is to attract and retain their business. Quality-based metrics are being used in many countries across the world to inform

financing care through self-pay—struggle to find enough money (through taxes, raised premiums, or out-of-pocket funds) to keep up with the high annual growth in healthcare costs. Therefore, they are applying more pressure to healthcare systems to deliver high-quality care more affordably. Taking the English National Health Service (NHS) as an example: public funding has risen in line with GDP growth, but the cost of healthcare has grown faster still. The NHS has increased the efficiency of its provision of care but is struggling to do so at the rate required to close the gap. In 2017, 44 percent of NHS hospitals were spending more than their budgets, up from 26 percent in 2013 and 8 percent in 2010.

In addition, the growing focus on primary care and secondary prevention is leading to proportionately more funding being directed towards those types of care. The percentage of health expenditures devoted to inpatient services has fallen gradually but consistently across almost all OECD countries since 2000.

Capital requirements and availability are also issues. Many hospitals across the world require significant capital investments because of aging infrastructure, the need for new technologies, or both. In some countries, however, capital funding is scarce.

In England, more than 40 percent of NHS hospitals are more than 30 years old, and there is a maintenance backlog in excess of £1.5 billion in London alone. To make ends meet in the context of costs rising faster than funding allocations, the NHS has, amongst other measures, transferred substantial amounts from the budget for capital investments—due to be spent on technology, cybersecurity, major equipment, and building works—to cover shortfalls in day-to-day running costs.

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pay-for-performance programmes. In Sweden, for example, performance-related payments are linked to quality targets and compliance with clinical guidance. Health-care financing is split by county councils and administered in different ways, resulting in varying payment methods throughout the country. However, most county councils have incorporated a pay-for-performance type of financing scheme, in which up to 3 percent of reimbursement to primary care practices depends on those practices achieving quality targets in such areas as patient satisfaction, care coordination and continuity, enrolment of patients in national registries, and compliance with evidence-based guidelines.\(^6\)

In England, NHS providers have incentives to support improvements in quality through payments from the Commissioning for Quality and Innovation, which pays for delivering specified improvements over and above baseline requirements set out in the NHS standard contract.\(^6\)


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