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Easing the pressure: Smart finance for healthcare

The 2020 edition of the Siemens Financial Services healthcare value indicator

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Management summary

The pandemic is expected to accelerate digital transformation in healthcare, as it has helped to highlight the value of digitalized health services in the form of telemedicine, remote diagnostics, AI-supported clinical decision-making, and the use of smart building technology for infection control.

This acceleration adds even further to the existing pressure to transform healthcare delivery through digitalization to implement more efficient, effective, and preventative medicine.

Rising healthcare demand around the world caused by increasing prevalence of chronic conditions, has already made this transformation an urgent imperative, to create healthier societies that consume less healthcare.

As digital transformation has accelerated, so too has the growing importance of smart finance to make this transformation possible and financially sustainable.

For healthcare to modernize and deliver increasing value to society, an upfront investment is required to transform care delivery, expand access to precision medicine and improve patient experiences/outcomes.

New requirements have come into play, demanding that healthcare buildings be fitted out with touch-free technology, smart HVAC for airflow management, and other infection control measures – all of which require additional investment.

Moreover, all these investments are taking place while trying to make sure that the backlog of treatments (such as in oncology) is eliminated and prevented from building up in future.

This short insight paper describes the principal approaches and specialist smart finance arrangements which are enabling sustainable digital transformation in today's pressurized operating environment, including:

- Modernizing and upgrading healthcare equipment and technology
- Implementing smart building transformation
- Financing enterprise-wide
- Maintaining liquidity and flexibility
- Embedding finance options into technology acquisitions

The paper also updates Siemens Financial Services Healthcare Value Indicator – a top-level model which tracks the pressure on resources in healthcare around the world, evaluates the improvements achieved in overall patient outcomes, and then combines these factors to give a comparative picture of value delivery in healthcare across fourteen countries.

Since the finances available to healthcare organizations were already highly constrained, which has now been exacerbated by COVID-19, the paper models the level of funds that can be liberated by smart finance – rather than being "frozen" and made illiquid if applied to outright technology purchases.

1. Creating value in healthcare through the crisis and beyond

Healthcare management in countries across the world has been undergoing a radical transformation.

Escalating demand for healthcare – particularly for chronic conditions – means that focusing simply on symptomatic treatment is rapidly becoming unaffordable. For instance, biologic drugs have been revolutionizing the treatment of a range of previously untreatable conditions – and yet they are very costly.

Now, health authorities are focusing on creating healthier societies to contain and reduce healthcare demand. Investment is being targeted toward mobile diagnostics to communities to help spot signs disease before it develops. The goal is to make healthcare systems sustainable and affordable long into the future.

To create healthier societies, however, requires an up-front investment in modern, usually digitalized, technologies that spot disease indicators very early to prevent the need for costly lifelong treatment.

A technology investment in diagnostic efficiency and therapeutic productivity is also required to make clinical treatment more effective and to contain costs when and where therapies *are* required.

Now the pandemic crisis has added further pressures. The demands on an already transforming system have been increased by a sudden need to also invest in touch-free technology, smart HVAC for airflow management, and other infection control measures in healthcare buildings. At the same time, the more restricted ways of working due to the pandemic cannot be allowed to delay other treatments, many of which are experiencing a backlog.[1]

Many commentators are noting how the pandemic crisis has highlighted the value of digitalization in healthcare, and they are predicting the likely *acceleration of digital transformation* in health systems across the world to revolutionize care delivery and reshape the patient experience.[2] Big data and Artificial Intelligence (AI) are being harnessed to deliver "sentinel" solutions that can detect signs of an impending infection outbreak and increase resilience when such outbreaks occur, as well as connect data silos between institutions for further efficiency, effectiveness and cyber-security gains.[3] Furthermore, the pandemic has starkly shown the advantages of telehealth,[4] which also requires *digital connectivity* between people, places and equipment.

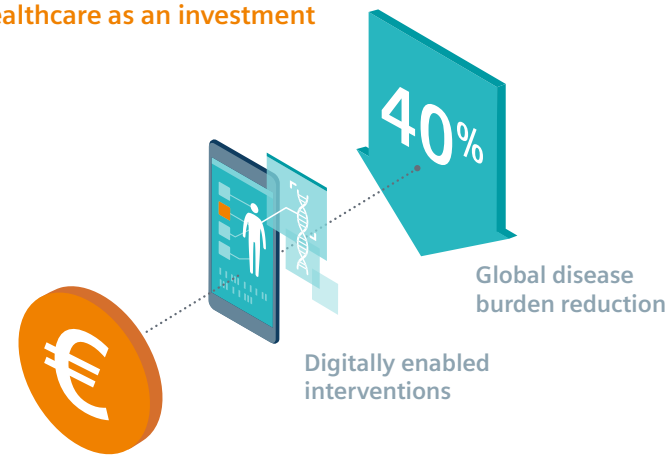
Finally, the backlog of delayed clinical activity may well put great strain on smaller healthcare units and encourage mergers with more resilient, larger organizations, whether in publicly-funded systems such as those in China or Europe, or insurance-funded private healthcare systems in the U.S.

In a world that will be experiencing the economic aftershocks of the global pandemic for some considerable time, capital remains very constrained – both for public and private organizations. Healthcare systems around the world have been experiencing shortages in capital expenditure budgets for some time, and authorities have widely acknowledged that the required investment simply cannot be afforded out of the public purse.[5] Harnessing private sector capital is therefore essential to healthcare's transformation and its underlying investment in new-generation technology – especially at a time when the pandemic has placed even greater pressure on already stretched systems.[6]

Recently, an important study from McKinsey has introduced the new mindset of "healthcare as an investment."[7] The study provides an alternative view to regarding healthcare as simply a cost burden. It estimates that the global disease burden could be reduced by around 40% by 2040 through investment in known interventions. The study notes that these interventions are becoming "more digitally enabled than in the past."

In summary, new ways of thinking about health systems are being proposed which regard healthcare as an "investment" with concomitant returns ("value"). This comes alongside accelerated recognition of the growing importance and "value" of digitalized medical technology – whether by delivering pathway productivity, diagnostic accuracy and speed, automated support for clinicians, improved patient outcomes or enhanced healthcare worker safety in the light of the pandemic. However, the "elephant in the room" is how to make that investment financially sustainable. Accelerated transformation puts more financial pressure on already over-strained healthcare systems. Transformation requires capital investment – capital that the healthcare sector does not typically have. Yet, without transformation, each healthcare system's ability to deliver value will be diminished in the short-term and will chronically decline in the longer-term. Smart finance, which harnesses private sector capital, is therefore essential for healthcare organizations to transform their ability to deliver value.

Healthcare as an investment



Business outcomes through smart finance

Partnering Klinikum Brauenschweig to deliver new technology

Comprised of 21 clinics and 17 institutes, Klinikum Brauenschweig in Northern Germany wanted to completely upgrade its radiology and emergency facilities. To do so the hospital was looking for a long-term technology and financial partner.

Siemens Healthineers Value Partnerships enabled the delivery, installation and now maintenance of the complete radiological equipment fleet (MRI, CT and X-ray) – with an innovation guarantee which covers updates and upgrades.

Financed over 10 years, the arrangement offers an affordable and clearly calculable managed equipment services contract.

The hospital now has the most modern medical technology at its disposal to provide optimal patient care with maximum cost security.

Siemens Healthineers and Geisinger agree to a 10-year digital health partnership

Siemens Healthineers and Geisinger have established a 10-year Value Partnership to advance and support elements of Geisinger's strategic priorities related to continually improving care for their patients, communities, and the region.

Geisinger is a nationally recognized regional healthcare system in Pennsylvania, U.S., that provides highly effective care delivery. As a leader in transforming delivery of healthcare, Geisinger has pioneered a high-performance digital care environment.

A global pioneer in medical technology, Siemens Healthineers will provide Geisinger access to its latest digital health innovations, diagnostic imaging equipment, and on-site staff to support improvements during the life of the agreement.

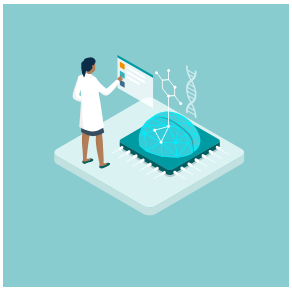
Education and workflow resources will also be available, which will provide Geisinger staff with the ability to efficiently make decisions and continually optimize workflows.

2. Illustrating healthcare value in today's markets

What, then, does "value" in healthcare look like?

Essentially, value is delivered by structures, ways of working, clinical pathways and technologies that empower healthcare organizations on their journey toward expanding precision medicine, transforming care delivery, improving patient outcomes and experience – all enabled by digital transformation. The aim is to create healthier societies where the demand for healthcare is first contained and ultimately reduced.

Some examples of Siemens Healthineers applications from the world of diagnostic imaging help to demonstrate this value delivery. The following descriptions cover a few aspects of how digital capabilities are delivering value managing the current pandemic – yet these examples will also continue to improve access to healthcare and improve procedure efficiencies long into the future.



Expanding precision medicine

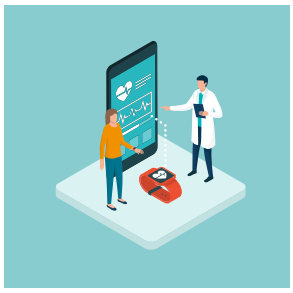
Medicine is becoming more precise. However, much medicine today is still based on a "one-size-fits-all" practice: Targeted therapies are possible but are impractical to scale. The goal of expanding precision medicine is to provide the right treatment at the right time for every patient. Tailoring treatment starts with a highly specific diagnosis without unwarranted variation.

Based on data integrated from existing sources, adding genomics and radiomics enables a holistic understanding of the individual. These unique characteristics steer the personalization of treatment. A precise understanding of a patient's condition is the most effective approach to deliver outcomes favorable to all stakeholders.

Transforming care delivery

Value is shaping care delivery. However, today's healthcare is often not built for this: Care delivery is fragmented, and payment models often incentivize volume rather than outcomes. To increase value, care needs to be organized around a patient's medical condition.

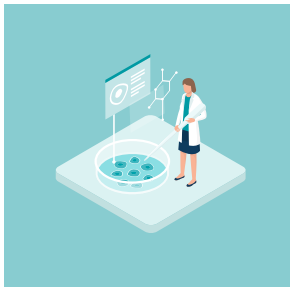
Transforming care delivery begins by making sure all patients have convenient access to the specific care that they need. Highly productive teams perform along an optimized, integrated pathway. New provision models ensure value is at the heart of care delivery – designed to reduce costs with no sacrifices in outcomes.



Improving patient experience

Patients are becoming informed consumers. But today, the patient journey is still in its infancy despite patients increasingly choosing healthcare providers who can respond to their needs. Improving patient experience is about improving the sum of all interactions that influence patient perceptions across the continuum of care.

This starts with engaging people before they become patients and it continues with the diagnostic and therapeutic experience in a care setting. Once accurately diagnosed, what matters to patients is preferred treatment outcomes that, ultimately, lead to higher quality of life. Patients stay loyal to health systems that create excellent experiences.



Digitalizing healthcare

Healthcare is inexorably becoming digital. But unstructured data and a lack of analytical capability keep providers from unlocking the full potential of their organizations. By managing data as a strategic asset, providers are gaining unprecedented insight into clinical and non-clinical processes. They are becoming able to leverage powerful analytical tools, including AI technologies, to improve decision-making.

Virtual access, telemedicine, and secure knowledge exchange will strengthen bonds between patients and care teams. A cultural shift to a digital mindset, coupled with new technology, is enabling development of a continuously improving health system.

Digitalization is a key enabler for high-value care. Technologies like AI-powered decision-support are paving the way for expanding precision medicine. Increased automation and care coordination will transform care delivery. Patient portals and mobile apps will improve patient experience.

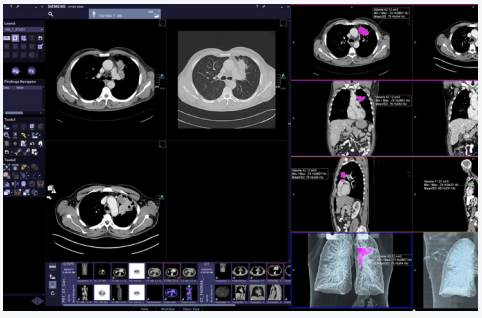
3. Healthcare value dealing with the pandemic

Aside from the strategic value being delivered over time by digital transformation, there are several advantages that have proved very important when dealing with the immediate pandemic crisis. Some examples of Siemens Healthineers applications from the world of diagnostic imaging, artificial intelligence, and big data help to demonstrate this value delivery. The following descriptions cover a few aspects of how digital capabilities are delivering value managing the pandemic – yet these examples will also continue to improve access to healthcare and improve procedure efficiencies long into the future.

Rapid deployment of mobile diagnostic imaging

Scanners on the Siemens SOMATOM go. platform can be delivered rapidly to areas where COVID-19 is prevalent. These scanners can also be installed in temporary units to provide access in high-demand or in isolated areas. The mobile workflow of SOMATOM go. platform scanners permits technologists to maintain a distance of at least 1.5 m (5 ft) from potentially infected patients.

To build up much-needed scanning capacity, mobile container solutions and other similar deployments with a SOMATOM go. scanner have already proven themselves in numerous countries, including China, the U.K., the U.S., Germany, Austria, Poland, and Portugal.



How remote scanning assistance can help CT, MRI and PET

syngo Virtual Cockpit from Siemens is a software application for remote scanning assistance. It enables healthcare organizations to provide comprehensive scanning assistance to imaging personnel – regardless of their physical location. In cases requiring advanced skills and recourses, technologists can always call on an expert for live support.

Even in times of staff shortages and high workloads, organizations can provide examinations – because experts are remotely available everywhere. Patients can be provided access to nearby scanner sites and scheduled quickly with shorter wait times.

myExam Companion simplifies scanning by guiding users through the CT procedure

When scanning COVID-19 patients, myExam Companion individualizes dose and scan settings by identifying input from the patient and asking the technologists about the clinical indication. The answers are linked to predefined scan parameters and postprocessing tasks.

Patients with suspected COVID-19 are typically scanned with the high-resolution technique with additional reconstructions: coronal and sagittal. Follow-up procedures can be scanned with a Tin Filter in order to reduce the dose to a minimum level.

The acquisition speed can also be tailored to the breath-hold capabilities of the patient.

AI algorithms developed collaboratively to help with COVID-19

AI algorithms applied to CT images can be a useful tool for the detection of COVID-19 symptoms and help with follow-up and treatment planning.

AI-powered analysis of chest scans has the potential to alleviate the workload of radiologists, who must review and prioritize a recent spike in the number of patient chest scans.

Siemens AI expert teams developed two new algorithms, among them the CT pneumonia analysis.

FAST 3D Camera for automatic patient isocentering – even at a distance

The FAST 3D Camera takes visual and infrared data from the patient lying on the table of a CT scanner. The measured data are used to calculate the starting position of the scan as well as the best height to support accurate isocenter position. Positioning the patient in the isocenter is a precondition to enable the lowest possible dose and consistent image quality. The table can then be moved to the calculated position at a push of a button.

For COVID-19 patients in particular it is important that the radiographer can use touch panels on the gantry covers or wireless mobile tablets in order to operate the FAST 3D Camera and the remote control to move the table to the scan position. This allows the radiographer to position with accuracy and with a minimal need for close contact to an infected patient.

Remote care management solution for COVID-19

The highly infectious nature of SARS-CoV-2 requires effective quarantine to avoid further virus transmission. Unnecessarily exposing scarce healthcare workers has to be avoided at all costs.

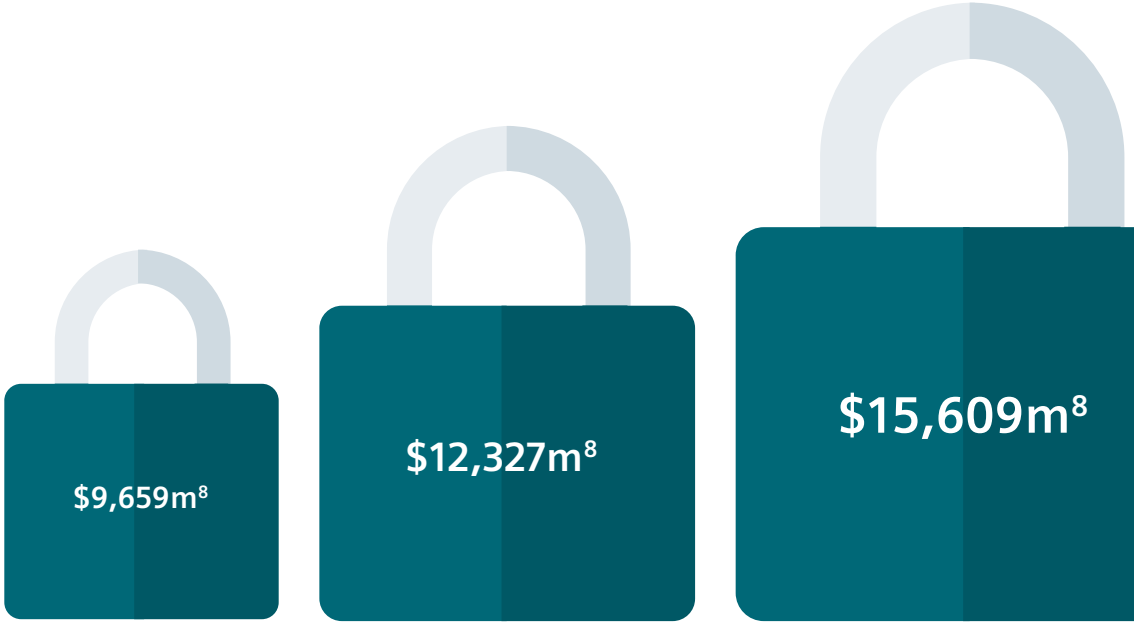
With many healthcare systems at the limit, staying at home and self-monitoring of health status may be the only option for health authorities to keep infected patients with no or only mild symptoms out of hospitals, GP offices and emergency departments.

With teamplay myCare Companion from Siemens, a web-based platform, providers and patients can share relevant health information and the dedicated smartphone app promotes structured patient engagement.

4. Enabling transformative healthcare value through smart finance

Frozen capital example

Diagnostic imaging capital expenditure (2020-2025) that would be "frozen" and made illiquid if financing plans are not used to acquire new generation technology



This insight paper has quoted a wide variety of sources that underline the need to access private sector finance to enable an accelerated digital transformation journey – through and beyond the aftermath of the pandemic crisis. Smart finance is needed to make digital transformation happen in a financially sustainable way. Not only does smart finance make new-generation equipment and technology affordable, it also liberates capital expenditure which would otherwise be "frozen" in the outright purchase of technology. By using financing arrangements, these funds remain liquid and available for other urgent and tactical needs.

The most effective "smart" finance arrangements tend to come from specialist financiers who understand the ways healthcare organizations work, the technologies they deploy, and the likely real-world benefits that technology investments will produce. This specialist knowledge enables the finance provider to flex and structure financing arrangements and periods so that they are truly sustainable for each healthcare organization, aligning payments with the operating and clinical improvements gained.

What, then, are the principal smart finance techniques that are helping to make digital transformation happen?

The following scenarios illustrate the critical role of smart finance in enabling healthcare's transformation to the "new normal."

Modernizing and upgrading equipment and technology

Capital funds are constrained – especially given the pandemic crisis – yet acquiring new-generation, digitalized technology is critical to improving diagnostic accuracy and productivity, precision medicine interventions, remote access to healthcare, and much more. Smart finance makes equipment and technology acquisition more financially sustainable, spreading payments and aligning them with the benefits received.

Business outcomes through smart finance

Funding a new facility

A European hospital group had various urgent needs including accelerating radiographer productivity for more rapid triage and enabling more remote patient consultations to improve access to clinicians and therapy adherence. The required solutions combined brand new technology with the retrofit of existing platforms. A combination of hardware and software was needed.

In collaboration with a specialist financier that had a deep understanding of the required technology and its benefits in practice, a tailored financing arrangement was constructed. The arrangement was flexed to suit the hospital group's cash flow profile. The financing structure also covered the cost of maintenance, service, and training, and even offered an upgrade possibility partway through the financing period just in case an important change in technology came available.

Once this arrangement had been successfully put in place, the financier then offered an "umbrella" master agreement, making future transactions for tech acquisition easy and rapid.

Financing whole projects

Single pieces of equipment must be implemented in context. They usually involve a whole raft of associated costs, such as setting up the buildings or facilities that house them – including mandatory environmental, hygienic, IT and infection control requirements. Smart finance, in the form of project finance or managed service agreements, makes these investments financially sustainable and embraces all costs in one financing agreement

Business outcomes through smart finance

Funding a new facility

A clinical group in Asia was interested in adding a whole new facility to their operations. Adding this unit would reduce subcontracting costs and expand revenues, as well as improve resilience as the organization would no longer rely on third parties at times of healthcare demand peaks.

The group worked with a specialist financier and solutions provider that was able not only to provide the required medical technology, but also the high-spec building technology that would house the clinical equipment and comply with stringent environmental and infection control requirements. An all-encompassing financial structure used, in part, expected operational savings to partly fund the monthly payments. It was also structured so that payments did not start until the unit was completed and working, avoiding the need to pay for old facilities while new ones were under construction and being fitted out.

Maintaining liquidity and flexibility

Public and private medical facilities face daily cash flow pressures. To achieve value delivery in healthcare, the right funds need to be available at the right time. Smart finance offers a range of cash flow management tools to achieve this, covering short-term loans, invoice finance, even transition arrangements that ensure organizations are not paying for a new system or facility until it becomes operational and begins to deliver value.

Business outcomes through smart finance

Funding seasonal requirements

A U.S.-based clinic needed to invest in additional CT equipment to capture business resulting from a local increase in demand for treatment. This presented the clinic with a financial problem, in that the flow of business tended to be seasonal, with as much as a four-fold variation in monthly demand depending on the time of year. Moreover, the clinic wanted to invest up front in marketing campaigns to attract more business in their low periods in coming years.

In order to manage the working capital requirements presented by all these factors, the clinic worked with a specialist financier to implement a cash flow management arrangement – a mixture of invoice finance and loan facility – so that the right funds were available at the right time to make all this financially possible. The financier's in-depth knowledge of the sector meant that it understood the value of such cash availability and the contribution it would make to the organization.

Financing healthcare technology sales

Healthcare organizations have a wide supply chain of product and technology providers. Often, the point of need for new equipment or technology comes at a moment when available funds are under pressure from other urgent requirements. These supply chains benefit from having embedded, integrated financing options. These offer smart finance tools to speedily optimize the process of managing working capital and cash flow when acquiring urgent technology upgrades.

Business outcomes through smart finance

Delivering a best-in-class financing solution

A variety of Chinese healthcare organizations wanted to acquire best-in-class equipment and software from a particular global supplier which would add considerable value to their operations – specifically using Artificial Intelligence (AI) to present clinicians with possible tissue anomalies and speed up their diagnostic decisions and therapeutic decisions to improve patient outcomes. Equally, the medical device company wanted to fulfill rapidly rising demand in its Chinese export market, but was having difficulty scaling up sales. Its standard payment terms meant that receipt of payment lagged significantly behind its need to invest in building and supplying products to these far eastern customers. Without a suitable financing arrangement, sales would be lost, and customers would not have the benefit of the company's best-in-class devices.

By working with a finance provider with specialist knowledge of the market in China and an international reach, the device company put smart finance facilities in place. First, a leasing option was embedded into the company's sales proposition, meaning that customers could invest more easily because they could opt for a monthly payment option, rather than up-front capital costs. Effectively, the financier bought the equipment from the medical device supplier and then leased it to the healthcare customer, so the device company got their payments up front and could reinvest that revenue immediately in further production. In addition, an "extended payment terms" arrangement was put in place with the device company's supplier, so that the suppliers were paid immediately, but the device company did not have to fulfill their invoices until a point closer to their own sales transactions. Both ways round, cash flow was optimized so that healthcare organizations found it easier to invest in upgraded "value" technology, and the device company could maximize sales into this exciting marketplace.

Implementing smart building transformation

In hospitals across the globe, several drivers are making buildings smarter and more digitalized: healthcare systems are under intense pressure to achieve operating cost efficiencies; new ways of working are being deployed to improve hygiene, infection control and safety; and at the same time, regulations are demanding regular upgrades in areas such as fire and security as well as carbon footprint reduction and energy efficiency. Smart, digitalized hospitals, which already use technology such as touchless controls, distanced temperature measurement, and remote buildings management, have been seen to cope better with the pressures of a global pandemic – an inspiration to others to accelerate their digital transformation.

Business outcomes through smart finance

Smarter healthcare campuses

Signature Healthcare, an award-winning health system based in Brockton, Massachusetts, U.S., worked with Siemens to identify critical upgrades to its main heating and cooling systems at its primary hospital campus, resulting in a $9 million infrastructure improvement plan.

Signature Healthcare benefitted from a single Siemens solution, which included project design, equipment, construction, and financing.

By leveraging the full breadth of Siemens' expertise and smart finance structures, Signature Healthcare was able to fund the infrastructure plan, simplify its debt structure by refinancing and, ultimately, provide for financial flexibility.

In short, Siemens was able to provide a turnkey project solution from start to finish. The project also identified opportunities for facility improvements and facilitated multifaceted financing that is fundamental for Signature's future plans.

5. Measuring value delivery in healthcare

Health systems around the world are developing methods to measure the value that their investments – in technology, people and pathways – are delivering.

At a broad strategic level, Siemens Financial Services (SFS) has established a model that indicates the relative value that different countries' health systems are delivering and how that is changing over time. The model also provides context for the role of smart finance in enabling value delivery through financially sustainable next-generation technology acquisition.

In consultation with a group of senior healthcare managers and management consultants from 14 countries spanning the globe, Siemens Financial Services has constructed an indicative model of resource pressure and patient outcomes for each country. First published in 2018, the 2020 updated edition's results are published below.[9] The model is deliberately simple and transparent. It uses official datasets and other datasets collected consistently across the countries studied.[10]

It should be noted, however, that the data sources underpinning the SFS model do not cover the period of the current pandemic. A future refreshing of the model will be conducted in 2021/22 when official datasets of key data from the current period will have been collected and validated.

The model is not designed to deliver healthcare strategy solutions, but rather to provide a broad analytical framework for healthcare organizations, groups, and policymakers to consider when obtaining increased value from their healthcare institutions and systems. The model also provides a background against which to consider the financial management issues discussed in this paper. Indeed, the arguments contained in this paper may well prompt useful discussion within individual healthcare organizations, adding an extra dimension to their own ongoing analysis of resource pressures and patient outcomes, especially in the light of the additional strain imposed by the pandemic crisis and its aftermath.

Both resource pressure trends and patient outcomes improvements are intimately connected to smart finance solutions. The ability to acquire new generation technology helps ease resource pressure by introducing more efficient and effective therapies – along with greater access to preventative procedures such as screening and scanning.

Equally, smarter financial management optimizes the availability of funds with which to maximize the impact of resources – human and technological – so that it transforms patient care and produces improved patient outcomes, both therapeutic and preventative. The resulting healthier societies, where demand for healthcare is contained or even reduced, are the ultimate "value" from healthcare investment.

Business outcomes through smart finance

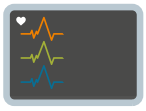
Improving liquidity in the pandemic

One of the U.S.' largest healthcare systems, located in Texas, needed to increase its liquidity as a result of financial disruptions from Covid-19.

SFS helped increase its existing asset-based lending finance by USD$500 million to USD$2 billion.

Working with Siemens Healthineers as the preferred vendor for high-value scanning and pathology lab equipment, Siemens – through its technology and financing expertise – has helped this Texas-based healthcare system strengthen its capacity to serve patients and the community.

In reading the following tables, a rise in resource pressure has negative connotations. An improvement in patient outcome score is clearly positive. When the two are expressed as a ratio ([patient outcomes ÷ resource pressure] x 100) then the policymakers ideal result – reduced pressure combined with improved outcomes – produces a highly positive value indicator score.



Patient outcomes score

The patient outcomes score is designed to act as a simple indicator of the effectiveness and quality of a healthcare system. It combines several consistently reported factors: immunization rates, life expectancy, five-year cancer survival rates, diabetes prevalence (inverse), and the World Health Organization's quality indicator – Disability Adjusted Life Years (DALY) (inverse). A higher resulting score means that a health system is delivering better quality outcomes. A lower score means health outcomes are poorer.

Resource pressure gauge

The resource pressure gauge combines three key factors indicative of the level of available resources in a health system: its annual health budget, its density of clinicians and care staff, and its density of diagnostic imaging equipment. The level of "pressure" on those resources is determined in relation to the age dependency ratio (the burden of young dependents and the proportion of the population aged over 65 – higher consumers of healthcare – both of which increase the resource pressure on a healthcare system). Lower pressure is positive, higher pressure negative.

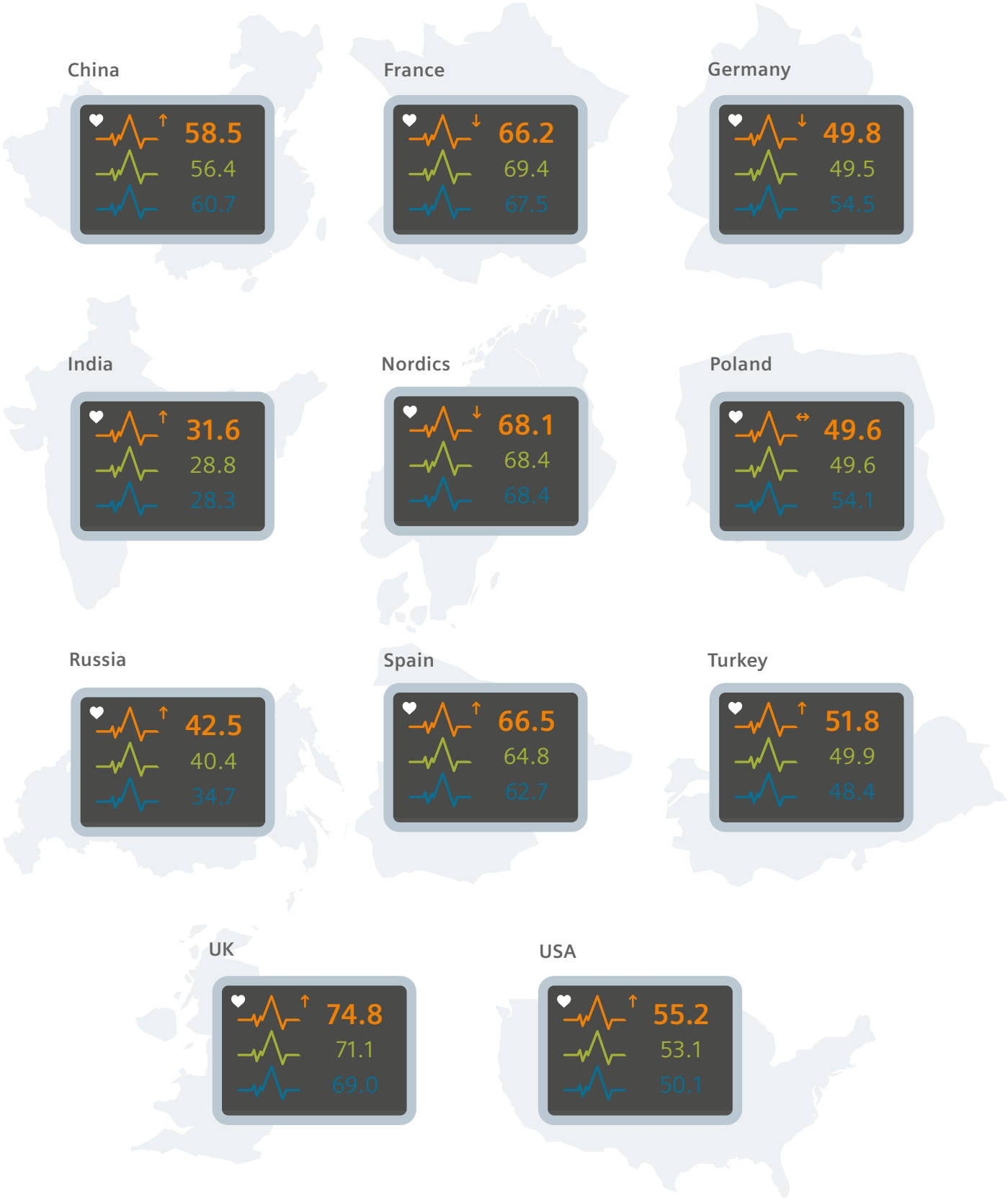
Healthcare value indicator

The value indicator is calculated simply by taking the ratio of patient outcomes to resource pressure. This provides an estimate of the value a health system is delivering. If a health system is well-resourced (low pressure) and producing better outcomes (high score), then the value indicator will be higher. High pressure – i.e. poor resources relative to demand and low outcomes – produces a low value indicator score.

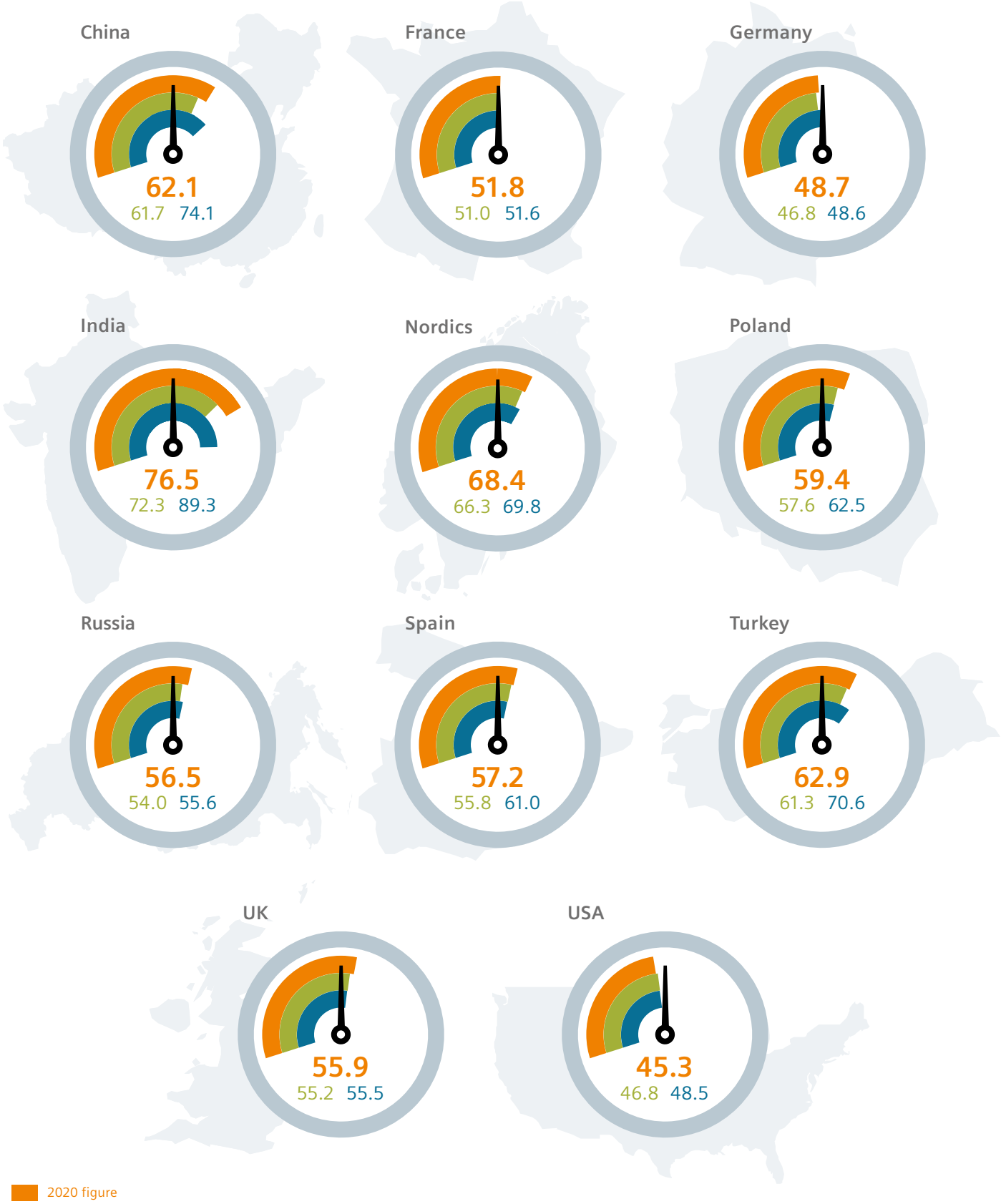
Methodology

31 senior managers, experts and management consultants in the healthcare sector from 14 countries were interviewed in autumn of 2020. Each was asked to advise on the factors that should be included in a simple "gauge" of pressure on national healthcare systems and which factors would best conceive a broad measurement of patient outcomes. Certain factors were chosen as good "proxies" to form a wider picture of healthcare provision and results.
For instance, diabetes prevalence was selected for its significance as an exceptionally strong indicator of lifestyle and diet-induced morbidities, as well as typical co-morbidities such as obesity, cardiovascular disease, liver disease and kidney disease. In the resource pressure model, the density of diagnostic imaging technology was chosen not only because it is a critical factor in early diagnosis and prevention, but also because it acts as a strong proxy for the overall volume and sophistication of investment in medical devices. Respondents advised not only on underlying factors for this model,[14] but also on the consistency and quality of data available across the countries selected. The model is applied to construct a portrait of each healthcare system today (2020), then the same analysis is performed with data from two and five years prior (in 2013 and 2018). This reveals a value trend in each country or cluster.

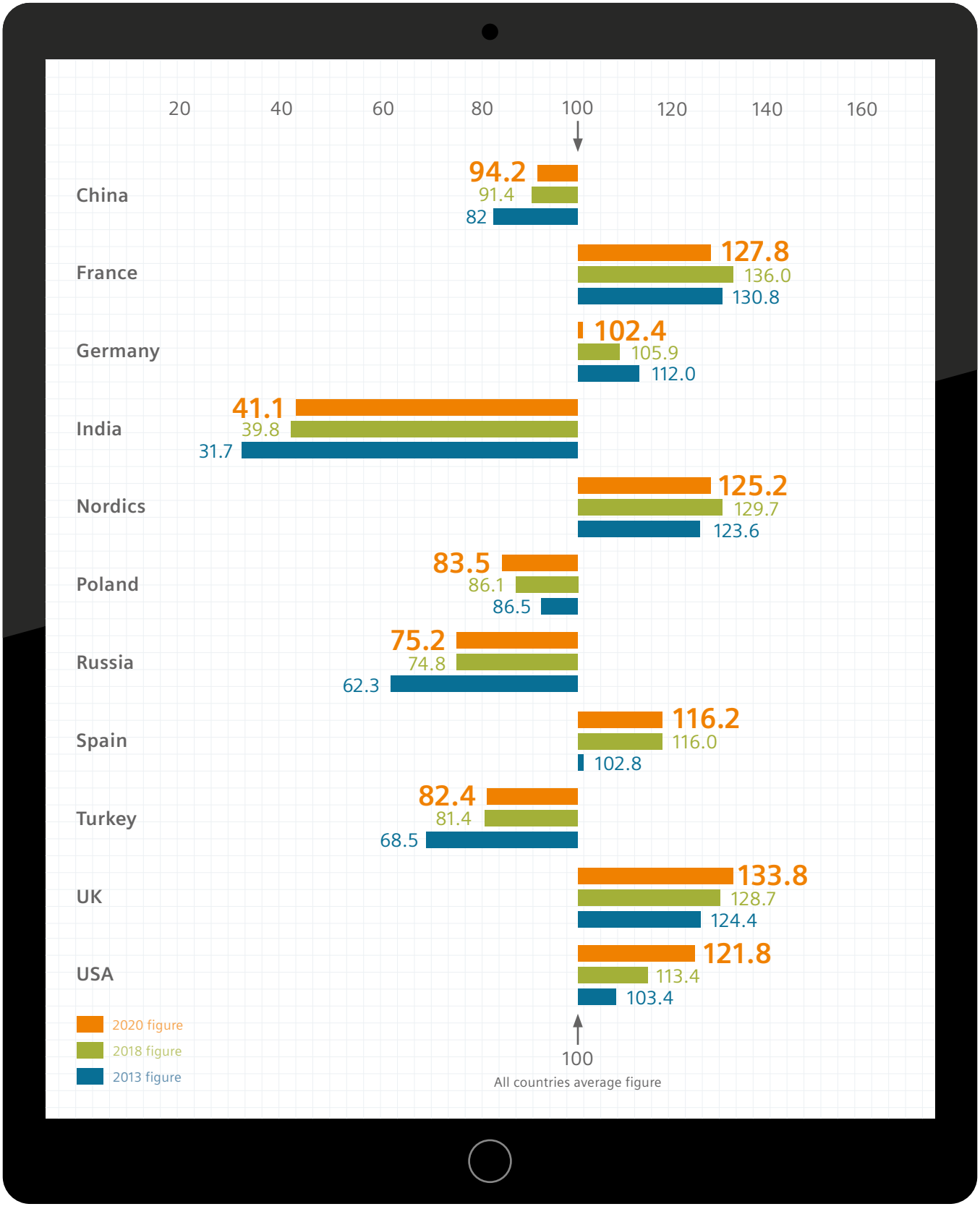
Patient outcomes score



Resource pressure gauge



Healthcare value indicator



The trendlines in each of the countries studied fall into several groups.

In the United States, the Healthcare Value Indicator shows steady progress across the years studied – a revised trend since the original Indicator edition as some official datasets have been revised. The country puts massive financial resources into healthcare, measured as a proportion of GDP – larger than any other. However, the disease burden in the U.S. is higher than comparable countries,[11] meaning that this abundance of resources does not necessarily produce proportionately higher health outcomes. Nevertheless, all-cause mortality rates in the U.S. have fallen steadily, creating a mild increasing in Healthcare Value Indicator score.

In Europe, Indicator scores have generally stuttered across the study period – although from a relatively high base compared to other regions of the world. This reflects the fact that these systems spend considerably less than the U.S. (as a proportion of GDP), yet produce higher patient outcome scores, especially in disease survival and/or mortality rates.[12]

In the South Asia and Asia-Pacific regions, steady Healthcare Value progress is being achieved. Although coming from starkly different starting points, ModiCare in India[13] and the five-year planning initiatives in China[14] are producing steady progress in Healthcare Value. Nevertheless, rising chronic morbidities,[15] the result of increasing social wealth and diet change, are tempering the advances in social healthiness access that these major investments are achieving.

Therefore, whether in highly mature healthcare systems (the U.S. and Europe) or rapidly developing ones (Turkey, China, India), smart finance remains a critical lever to improve value that those healthcare systems can deliver.

The authors of this paper recommend that any healthcare institution that is not yet making widespread use of smart finance may be well advised to conduct an urgent review to see how operating budgets could be positively impacted and how digital transformation might be accelerated. As this paper had demonstrated, the initial body of evidence and examples is now sufficiently strong that the question is less about whether smart finance should be deployed, and more about where, when and how quickly.

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8 Methodology used to calculate "frozen capital":
- Annual spending on "financeable" healthcare equipment is identified
- The country's equipment financing penetration rate is then subtracted from this sum
- A conservative estimate of equipment fleet replacement with digitalized, new-generation versions over a five-year period is then applied

The remaining sum is regarded as largely "frozen" in that it has been locked in to outright purchases. If private sector equipment and technology financing had been deployed, payments would have been spread across the lifetime of the asset (in the form of monthly payments) and thus better aligned with the efficiency savings and improved patient outcomes the equipment/technology asset delivers.

9 Historical scores have changed since the original 2018 publication of the SFS Healthcare Value Indicator. This is due to the revision of a number of the official datasets which underpin the Value Indicator. The methodology remains unchanged.

10 Methodology: 31 senior managers, experts and management consultants in the healthcare sector from 14 countries were interviewed. Each was asked to advise on the factors that should be included in a simple "gauge" of pressure on national healthcare systems, and which factors would best conceive a broad measurement of patient outcomes. Certain factors were chosen as good "proxies" to form a wider picture of healthcare provision and results. For instance, diabetes prevalence was selected for its significance as an exceptionally strong indicator of lifestyle and diet-induced morbidities, as well as typical comorbidities such as obesity, cardiovascular disease, liver disease and kidney disease. In the resource pressure model, the density of diagnostic imaging technology was chosen not only because it is a critical factor in early diagnosis and prevention, but also because it acts as a strong proxy for the overall volume and sophistication of investment in medical devices. Respondents advised not only on underlying factors for this model, but also on the consistency and quality of data available across the countries selected. The model is applied to construct a portrait of each healthcare system today (2020), then the same analysis is performed with data from two years ago (2018) and seven years prior (in 2013). This reveals a value trend in each country or cluster. Resource pressure indicators include: healthcare spending, healthcare professional densities, diagnostic imaging densities, age dependency, aged population. Patient outcomes indicators include: cancer survival rates, diabetes prevalence, disability-adjusted life years, immunization and case detection rates.

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