Working Paper

Value in Healthcare
Laying the Foundation for Health-System Transformation

Prepared by the World Economic Forum, in collaboration with The Boston Consulting Group (BCG)

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Executive Summary

Over the past century, the global healthcare sector has doubled life expectancy and dramatically improved quality of life—yet there is growing concern about the sustainability of our healthcare systems

- Costs are growing at roughly double the rate of growth in GDP, putting severe pressures on healthcare budgets and constraining further development
- Meanwhile there is growing evidence that as much as 30% of healthcare spending is wasted on unproven or unnecessary treatments
- The quality of care delivered varies widely across different provider institutions
- This situation is not the result of bad intentions but of our approach to managing the growing costs and accelerating complexity of healthcare

In response, leading stakeholders across the globe have embarked on a transformational journey to improve healthcare value for defined patient groups or population segments.

- Value-based healthcare is a novel and genuinely patient-centric way to design and manage health systems
- It has the potential to deliver substantially improved health outcomes to patients at significantly lower cost than health systems today are able to achieve
- At the moment, however, in spite of some remarkable achievements, most value-based initiatives in healthcare are isolated islands of innovation
- The key challenge is to learn from these examples and accelerate the transition to value-based healthcare across health systems throughout the world
- How to do so is the focus of the Value in Healthcare initiative of the World Economic Forum, in collaboration with The Boston Consulting Group (BCG)

Value-based healthcare aligns stakeholders around delivering value to patients; it does so in three important ways:

- Systematically measuring the health outcomes that matter to patients and the costs required to deliver those outcomes across the full cycle of care
- Tracking outcomes and costs for defined population segments—patients with a diagnosis (for example, lung cancer), individuals at risk of developing disease (for example, pre-diabetes), and healthy individuals benefitting from prevention (for example, newborns)
- Tailoring interventions (including medical, social, and behavioral treatments) to improve value for each population segment
Four key enablers support this patient-centric delivery model; health systems now need to align these enablers around value

- Informatics—so outcomes data can be easily collected, analyzed, and shared
- Benchmarking, research, and tools—to leverage outcomes data for clinical innovation
- Payments—to create incentives for all stakeholders to focus on value
- Care delivery organization—to improve coordination across the health system

Policy makers have a critical role to play in enabling this paradigm, because healthcare is a highly regulated industry and policy influences all the other levers; key policy recommendations include:

- Mandate health outcomes tracking and set standards for data collection, analysis, and transparency
- Balance the trade-off between patient privacy and data sharing
- Enable cooperation, coordination, and partnerships along care pathways while protecting against conflict of interest
- Establish new reimbursement models that support longitudinal improvement in patient value
- Enable pharma and medtech companies to take increased accountability for and contribute more actively to healthcare value

The path towards value-based health systems will be gradual, progressing through four phases

- **Phase One:** Internal Performance Improvement. Individual organizations measure value and share results internally to drive improvement and alignment
- **Phase Two:** System Performance Improvement. Health systems standardize outcomes metrics to enable performance assessment and best-practice sharing
- **Phase Three:** Transparency and Value Competition. Public reporting and payment reform strengthens incentives to improve value and relevant innovation
- **Phase Four:** Value-Based Healthcare System. A fully reconfigured ecosystem drives faster continuous improvement in value for each population segment

This working paper synthesizes the preliminary findings of the first year of the Value in Healthcare project

- A revised version integrating feedback from the project session at the 2017 Annual Meeting of the World Economic Forum will be published in the spring of 2017
- The second year of the project will focus on detailing the IT requirements for value based healthcare, establishing a limited set of pilot projects on system transformation, and elaborating on policy recommendations and roadmaps
Preface

The World Economic Forum, in collaboration with The Boston Consulting Group (BCG), launched the Value in Healthcare initiative in June 2016. This two-to-three-year, multi-stakeholder project focuses on identifying the obstacles that prevent healthcare systems around the world from delivering better outcomes that matter to patients at lower cost, and on defining priorities for industry stakeholders to eliminate those obstacles and focus healthcare systems on value.

The project’s executive committee is made up of senior leaders at organizations representing key stakeholders in the global healthcare sector. Its co-chairs are Joseph Jimenez, CEO of Novartis, and Rick Valencia, President of Qualcomm Life. Its members include Omar Ishrak, Chairman and CEO of Medtronic; Michael Porter, the Bishop William Lawrence University Professor at Harvard Business School; Edith Schippers, Minister of Health, Welfare, and Sport of the Netherlands; Simon Stevens, CEO of the National Health Service in the UK; Bernard Tyson, Chairman and CEO of Kaiser Permanente; and Christophe Weber, President and CEO of Takeda. A larger steering committee includes approximately 50 representatives from stakeholders across the healthcare sector.

Value in Healthcare: Laying the Foundation for Health-System Transformation is a working paper prepared as an input to the Value in Healthcare project session taking place on January 19, 2017 in Davos, Switzerland. The paper synthesizes the preliminary findings of the project with a focus on defining the problem, developing a comprehensive framework for a value-based health system, and proposing a high-level roadmap for system transformation with a special emphasis on the priorities for public policy. A revised version incorporating feedback from the steering committee and ideas from the Davos session will be published by the Forum in the spring of 2017.

Subsequent work of the Value in Health project will focus in more detail on a number of themes introduced in this initial report. For a detailed description of our 2017 plan, see the section “Next Steps for the Value in Healthcare Project.”
Value in Healthcare—A Call to Action

In many respects, the $7.6 trillion global healthcare sector is a remarkable achievement. Access is nearly universal in most developed economies and growing rapidly in the developing world. Breakthroughs in biomedical science and major advances in public health have led to a more than doubling of average life expectancy—since about 1900 in the developed world and since 1950 in the developing world—and significant improvements in quality of life for many who suffer from chronic disease or severe disabilities.

And yet, many stakeholders in the sector worry that this progress is unsustainable. Costs are growing at roughly double the rate of growth in GDP, putting severe pressure on healthcare budgets and, in some countries, leading to rationing in the form of longer waiting times or restricted access. Most providers, however, continue to be paid on the volume of procedures they deliver with almost no systematic assessment of the quality of services provided or even whether they are medically necessary. There is growing evidence that a significant portion of healthcare spending—as much as 30% according to some estimates—1—is wasted on unproven or unnecessary treatments and that the quality of care delivered varies widely across different provider institutions.

Recently, however, a new development has emerged in response to these problems. Some leading stakeholders in the industry have begun to redefine their mission and their operating model to focus on improving healthcare value, or the health outcomes that matter to patients relative to the resources or costs required. Consider the following illustrative examples:

- **In India**, the Aravind Eye Care System, a network of hospitals dedicated to providing low-cost, high-quality cataract surgery, combines the systematic tracking of health outcomes with an integrated approach to care delivery. The result: health outcomes equivalent to those of the best providers in the world at approximately one-tenth the cost per surgery in the US.2

- **In Germany**, Martini-Klinik, a prostate cancer center at the Eppendorf University Hospital in Hamburg, collects comprehensive data on the health outcomes of its patients, including the documentation of all postsurgical complications down to the level of individual surgeons, and uses the data to continuously improve its performance in prostate cancer care. As a result, the clinic’s rates of severe erectile dysfunction one year after surgery are less than half the German average, and instances of urinary incontinence are about one-seventh the average.
In the US, Kaiser Permanente (KP), an integrated payer-provider with 10.6 million members, has created an integrated model of care delivery that emphasizes preventive care and the active management of chronic disease, and includes incentives that simultaneously promote excellent clinical outcomes and resource efficiency. KP has been able to provide employers with health benefits that cost between 10 percent and 20 percent less than traditional managed-care plans, while delivering outstanding quality. Between 2012 and 2014, its health plans took the top three spots in the US National Center for Quality Assurance (NCQA) Medicare plan rankings, and the company’s commercial plans were in the top 10 percent of the NCQA’s ranking of national commercial plans. And KP consistently has the highest member satisfaction in its markets.

In Sweden, more than a hundred quality registries covering the majority of national health expenditure systematically track the health outcomes for the population of patients suffering from a specific condition or disease. The accumulating body of data has allowed Swedish clinicians to identify which providers deliver the best outcomes, codify their clinical best practices, and share them with other providers, thus improving average health outcomes over time. A recent study, for example, demonstrated that 30-day mortality after acute myocardial infarction is 34% lower in Sweden than in the UK. What’s more, researchers are leveraging Sweden’s quality registry databases to conduct clinical trials evaluating the effectiveness of treatments and procedures—at roughly one tenth the cost of traditional clinical trials.

These examples begin to suggest the potential of a relentless focus on value to transform the global healthcare sector. We believe that national health systems face an extraordinary opportunity: to deliver substantially improved health outcomes to patients and at significantly lower cost than health systems today are able to achieve. Given the current size of the healthcare budget in most countries, such improvements promise to significantly raise national productivity through a more rational use of resources, both by eliminating current waste and by allowing more people to stay at work longer and contribute to society. The value-based approach to care will also improve access to appropriate care, spur innovations in treatment and the delivery of care, and provide major new business opportunities for both the public and private sectors.

At the moment, however, value-based initiatives in healthcare like the ones described above represent only isolated islands of innovation, often the result of visionary leaders being “in the right place at the right time.” Despite considerable progress and the remarkable results already achieved, no nation has fully embraced value-based healthcare at the level of the national health system. And even those institutions that have taken the lead are encountering obstacles to
change built in to how traditional health systems are organized, financed, and regulated, and how financial and non-financial incentives are structured.

In order for value-based healthcare to progress further, these obstacles need to be addressed in a systematic and comprehensive fashion. Until they are, progress in improving healthcare value is likely to be sporadic, unevenly distributed, and far slower than it might otherwise be. The key challenge, therefore, is to accelerate the transition to value-based healthcare in health systems throughout the world. How to do so is the focus of the World Economic Forum's Value in Healthcare initiative.

**Defining the Problem**

To understand the current state of play in value-based healthcare, the best place to begin is by looking more closely at the interlocking problems in the global health industry to which it is a response. The first such problem is the unsustainable rise in healthcare costs. In the developed world, which accounts for some 75% of global healthcare spending, costs have been growing at roughly double the rate of growth in GDP according to World Bank estimates. Although the rate of growth has slowed slightly in recent years in some countries, the long-term trend remains the same, despite decades of efforts at cost containment.

Rates of growth in the developing world are even higher. Since 2000, China’s spending on healthcare as a percentage of GDP grew almost five times as fast as that of the EU and more than three times as fast as that of the US. Although this reflects the lower base of healthcare spending in developing countries and the necessary expansion of access to healthcare, it is not sustainable over the long term. Most developing countries do not have—and may never have—the resources required to replicate the high-cost model of care delivery found in developed countries.4

In addition to rapidly rising costs, there is also widespread variation in medical practices, healthcare costs, and health outcomes across providers, regions within countries, and between countries. In the Netherlands, which has one of the best health systems in Europe, there is a ninefold variation in the rate of post-surgical complications from radical prosrte surgery depending on the hospital in which the patient has the surgery.5 In the US, patients in the poorest performing hospitals are three times more likely to die and 13 times more likely to experience complications than those in the best performing hospitals.6 And there is no clear causal relationship between money invested and health delivered in the global healthcare industry. The systems that spend the most money do not necessarily deliver the best health outcomes. Japan, for instance, spends slightly more than half the amount on healthcare per capita as the US does. Yet average life expectancy in Japan is about four and a half years longer than in the US.
There is also a growing realization in the industry that the incentives driving different stakeholders are fundamentally misaligned. The result is a series of behaviors that, seen from the perspective of the patient and of the system as a whole, are increasingly dysfunctional, leading to growing levels of inefficiency, mistrust, and frustration. Consider the following examples:

- Payers try to control costs by imposing constraints on medical decision-making and patient choice in the form of utilization reviews, drug formularies, prior authorization, restricted provider networks, and the like. As a result, highly qualified and experienced clinicians end up feeling micromanaged, caught between the demands of payers to contain costs, the demands of hospital administrators to maximize capacity utilization of expensive medical technologies, and their professional desire to provide the best treatments to their patients.

- The exponential growth in the world’s body of biomedical knowledge brings an ever-deepening understanding of health and disease and new tools to diagnose and treat patients—but also a growing complexity of clinical decision making. In most of our healthcare systems the vast majority of clinicians and nearly all drug and medical technology companies are paid on the basis of the volume of procedures and products they deliver. In the absence of outcomes measurement to assess the appropriateness of treatments, the proliferation of new therapies is a powerful driver of unnecessary practice variation and, in some cases, overtreatment. According to the scientific literature, the scientific basis for many clinical interventions—as much as 50% according to one estimate—remains frustratingly unclear. And there is growing evidence that a substantial portion of healthcare spending is on treatments that are medically unnecessary according to current widely accepted treatment guidelines. According to one estimate, in the US such overtreatment is responsible for approximately $750 billion in avoidable costs each year.

- Even when the costs and benefits of certain health interventions are well-aligned, many health systems do not invest in them. Take the example of prevention. As medical science learns more about the specific risk factors that lead to disease, prevention is becoming a highly effective way both to improve health outcomes (by preventing disease in the first place) and to control costs (by avoiding expensive care because fewer people become ill). And yet, because most health systems are still organized around the objective of “treating illness”—that is, providing care to those who are already ill—many countries systematically underinvest in prevention and public health.
In the midst of all these misaligned and contradictory incentives, it is easy to lose sight of the patient and his or her experience of the health system. The proliferation of new medical specialties has led to a step function increase in the complexity of the health system and, therefore, in the fragmentation of the patient experience. Increasingly, patients are being asked to take more responsibility for their health and to pay out-of-pocket for a growing share of the costs of treatment. And yet, they must do so in an environment characterized by extreme asymmetries of information which makes it virtually impossible for them to make informed choices among different providers or treatment options.

These misaligned behaviors aren’t necessarily the product of bad intentions. In our experience, the people who work in healthcare are among the most caring and committed in any industry, devoted to their patients, clients, and customers, and dedicated to relieving suffering and finding cures. They try to do the right thing. The problem is that today's behaviors are often rational responses to the complex regulatory frameworks, local rules, incentives, resources, and constraints that have evolved over decades and even centuries in healthcare, typically for good reasons at the time. But they have now combined to produce negative unintended consequences. In other words, dysfunctional behaviors are the product of an increasingly dysfunctional system. To change the behaviors, we must change the system.

**What Value Means in Healthcare**

The new focus on value in healthcare is an effort to address these interlocking problems in a holistic fashion. It does so by taking a principle that has guided healthcare professionals throughout history—doing their best for patients given the resources available—and making it the centerpiece of healthcare system design and organization. The fundamental principle of value in healthcare is, first, to align industry stakeholders around the shared objective of improving health outcomes delivered to patients for a given cost; and, then, to give stakeholders the autonomy, the right tools, and the accountability to pursue the most rational ways to deliver value to patients. This represents a fundamentally different way to think about the management and organization of the healthcare sector.

The many initiatives in value-based healthcare taking place across the world today have been instrumental in furthering our understanding of what a comprehensive value-based health system would look like. The graphic in Exhibit 1 describes the main components of such a system, which can be clustered into three broad areas.
Exhibit 1. A Comprehensive Framework for a Value-Based Health System

I. A New Model of Patient-Centered Care Delivery. The central objective of the value-based health system is the continuous improvement in the health outcomes delivered to patients for a given cost. In order to improve health outcomes and deliver them efficiently, the key unit of analysis is the population of individuals who suffer from the same disease or condition or who share similar risk profiles. By focusing on distinct population segments, providers can meaningfully track and compare health outcomes and costs, identify the causes of unnecessary variations, and improve the overall level of value over time. As providers track outcomes and costs for carefully defined population segments, they can begin implementing a new model of value-based care delivery, based on the design of highly customized—and increasingly precise—interventions for each group along the full life cycle of care. As international standards for outcomes measurement and transparency of reporting spread, improvements in clinical practice are likely to accelerate as growing numbers of innovative clinical teams engage across the globe.

II. Four Key Enablers of Value in Healthcare. To support and facilitate the reorientation of health systems around this new model of care delivery, there are four key enablers whose misalignment has hindered progress and whose alignment can greatly accelerate it:

- **Informatics.** Value-based healthcare is a data-driven approach to care management. As such, a key enabler of any value-based health system is a comprehensive informatics
infrastructure, including shared standards and new capabilities that enable the routine collection, sharing, and analysis of outcomes data and other relevant information for each population segment.

- **Benchmarking, Research, and Tools.** Once health systems begin to routinely track and share outcomes data, the resulting accumulation of data will become a powerful asset for driving research and innovation in healthcare, including systematic benchmarking for continuous improvement, identification of variations in responses to treatment and of emerging clinical best practice, new approaches to clinical trials, and the development of sophisticated decision-support tools for clinicians and patients.

- **Payments.** The way most health-care providers are compensated today is disconnected from the health outcomes they deliver—and, in some cases, actively discourages the improvement of healthcare value. Therefore, another key enabler will be new forms of compensation and reimbursement that support improvements in patient value.

- **Delivery Organization.** The way most provider networks are organized can make it difficult to create multidisciplinary teams and to achieve sufficient coordination across the full cycle of care, both of which are necessary to improve health outcomes and manage costs optimally. There are a variety of new roles and organizational models that are already taking shape in the provider ecosystem today which can enable the transition to value-based healthcare and that anticipate the delivery organizations of the future.

### III. The Role of Public Policy.

One enabler of value in health stands out from the rest because it has the capacity to influence all the others: public policy. The policies shaping the legal and regulatory environment governing the healthcare sector can either stand in the way of value-based healthcare or greatly accelerate the transition to it. Therefore, government policymakers will have a central role to play. As with any market, but especially with one that is as large, complex, and as highly regulated as healthcare, government has to create the appropriate legal and regulatory framework so the industry can function effectively and so that stakeholders in the industry can both cooperate and compete on what really matters: value delivered to the patient.

Despite the many islands of innovation, no national health system has systematically addressed all the elements of this model. There are signs, however, of progress—and, in some cases, considerable progress—in each of the elements. In the pages that follow, we describe the logic, the current state of play, the future challenges, and key next steps in each of these three areas. We have also outlined a preliminary roadmap for accelerating the value-based transformation of the global healthcare industry. This roadmap will be discussed at the Davos meeting and developed further in the second year of the Value in Healthcare project.
A New Model of Patient-Centered Care Delivery

The starting point for all efforts to improve value in healthcare is the systematic tracking of health outcomes over time and of the costs required to deliver those outcomes.

Defining healthcare value in this way has multiple advantages. First, it focuses on value delivered to the patient, not just to the health system as a whole or to any individual institution within it.

Second, it gives providers a way to address issues of cost from within the context of their core mission and the work they do every day—preventing disease and treating ill patients—and, therefore, is far more likely to motivate and engage clinicians and other medical personnel than traditional productivity improvement programs.

Third, the definition also creates a common frame of reference for the all-important dialogue between payers and providers about reimbursement and, more broadly, for the critical alignment of other stakeholders (for example, pharma and medtech companies) around the shared goal of improving value delivered to a defined patient group.

Fourth, through the ongoing tracking of standardized outcome metrics, health systems can analyze variations in outcomes—in a local network, a regional health system, an entire nation, and even across the globe—to identify and spread best practices, and continually improve the quality and cost-effectiveness of care. This approach dramatically broadens the base to identify and recognize relevant innovations and successful improvement initiatives.

Finally, and perhaps most important, this definition of value in healthcare empowers patients. It puts the focus on measuring the outcomes that matter to patients—that is, not only traditional clinical indicators but also broader factors such as a patient’s quality of life and ability to work. This way, providers can assess the full repertoire of what a care team brings to the patient—not only the right drugs or a technically accomplished surgeon, but also the right information or the right levels of trust and comfort, all of which are critical for the patient and the end result. What’s more, when patients have access to detailed information about provider health outcomes, they can make informed decisions on the basis of the outcomes that matter the most to them.

For all these reasons, the ratio of health outcomes delivered to defined patients groups for a given cost is the most useful way to think about value in healthcare. Improving those outcomes over time must be the critical guiding principle of any healthcare system.
Measuring Outcomes and Costs

Where does the global healthcare industry stand today on delivering against this objective? We are still very much at the beginning of the journey. With a few exceptions, most health systems do not routinely track health outcomes—and even fewer are able to link outcomes to the cost of the full cycle of care delivered to the patient.

To be sure, healthcare providers have been tracking an ever-growing number of metrics, often in response to requirements from payers or regulatory agencies. But the problem is that most of these metrics do not address actual health outcomes. Most providers track financial metrics (by department, usually in terms of whether a given unit is on budget) and process metrics (with an emphasis on waiting times and the productivity of individual units). Some measure “quality,” but when they do, quality is often defined as compliance with treatment guidelines (in effect, process efficiency) or in terms of patient satisfaction. Such metrics have their uses and in some situations may be relevant and important. But they typically emphasize efficient throughput for the institution or department or subjective experience of the patient, not the actual health outcomes delivered to patients suffering from a particular disease or undergoing a specific procedure. For example, of the 1,958 quality indicators in the U.S. National Quality Measures Clearinghouse, only 139 (7%) are actual health outcomes and only 32 (fewer than 2%) are patient-reported outcomes.

As more stakeholders in the sector have embraced healthcare value, however, there has been remarkable progress in developing methodologies and approaches for tracking health outcomes. One prominent example is the development and growth of so-called quality registries. Usually established by medical professional societies or patient advocacy groups, registries create databases and methodologies for the systematic tracking of the most relevant outcomes for all patients suffering from a specific condition or disease. There has also been considerable progress in the development of international standards for outcomes metrics across key disease categories. (See the sidebar “The International Consortium for Health Outcomes Measurement” on the following page.)

When it comes to tracking costs, providers have gained considerable experience in recent years as budget pressures have forced them to focus on cost-cutting and process efficiency. The problem, however, is that most approaches to cost tracking do not really link costs to the outcomes delivered. Conventional methodologies for analyzing healthcare costs typically use claims data as a proxy for actual costs. Costs are aggregated and analyzed at the level of the individual department or procedure, but they do not reflect the actual costs of the care delivered nor are they linked to the outcomes generated. The fact that costs for a given condition are distributed across many different departments and provider organizations makes it extremely
The International Consortium for Health Outcomes Measurement

Since 2012, the International Consortium for Health Outcomes Measurement (ICHOM), an independent nonprofit, has been convening global working groups of clinicians, patient representatives, and other leading experts to define and publish globally harmonized sets of outcome metrics for specific conditions, diseases, and population segments.

ICHOM has published standardized metrics and risk-adjustment variables for 21 major conditions, with an additional 8 under active development and 13 in the initial planning stages. By the end of 2017, ICHOM’s standard sets will cover more than 50% of the global disease burden in developed countries.12

ICHOM standard sets aim to define a comprehensive but minimally sufficient set of metrics that all providers should track for a given condition. The sets track outcomes not only in traditional clinical categories such as improving health, increasing life expectancy, and slowing, eliminating, or preventing disease, but also in broader areas that matter to patients such as minimizing time to recovery, dying a good death when recovery is no longer an option, and ensuring that treatment does not create undue burdens on a patient’s family.

A growing network of healthcare providers around the world is actively engaged in implementing the ICHOM standards. Currently, some 185 different organizations in 32 countries are implementing at least one ICHOM standard set and 33 are implementing more than one.

The consortium is directly supporting 40 hospitals and health systems in 13 countries, including the M.D. Anderson Cancer Center, Boston Children’s Hospital, and Stanford Healthcare in the US; the Great Ormond Street Hospital for Children in the UK, and Sweden’s Karolinska Institute. (See Exhibit 2 on the following page.)
difficult to get a clear picture of the whole. As a consequence nobody “owns” or can manage the trade-offs between cost and quality along the clinical pathway.

In recent years however, analysts have developed a variety of alternative methodologies for measuring healthcare costs. Probably the most comprehensive is a technique known as time-driven activity-based costing (TDABC). Using this methodology, providers develop detailed process maps to identify typical patient treatment pathways and the amount of time patients spend with each resource in the care pathway, then allocates cost based on the time patients spend with each resource.

Leading provider organizations are beginning to use TDABC to identify waste and improve efficiency. TDABC has also been used to analyze cost variation across multiple providers. A recent study compared primary total knee arthroplasties across 29 US hospitals and their affiliated orthopedic surgeons. The study found that the average cost of care varied by a factor of approximately 2 to 1—despite similar patient demographics and readmission and complication rates.

But providers don’t necessarily have to embrace TDABC to link costs to outcomes. Some organizations are embracing a more pragmatic approach that emphasizes identifying the main cost drivers for a given patient group or disease area—for example, average length of stay, operating theater time, the cost of key drugs and implants—and then managing those costs aggressively with the goal of continuous improvement over time.
Focusing on Distinct Population Segments

Value-based healthcare puts the patient at the center of the care delivery process. In order to improve healthcare value, the key unit of analysis is the population of individuals who suffer from the same disease or condition or who share similar risk profiles. By focusing on distinct population segments, providers can meaningfully compare health outcomes, identify the causes of unnecessary variations in those outcomes, and improve the overall level of outcomes over time.

The simplest way to define the population segments of a value-based system is to group all individuals who suffer from the same condition or disease—for example, all those with Type 2 diabetes or who have experienced an episode of acute myocardial infarction. Most quality registries track outcomes by disease or condition. A few track outcomes in the population of patients who have undergone a specific procedure—for example, hip or knee replacement—but while such a segmentation can have significant value for certain well defined procedures, it is not ideal, because it does not allow researchers to compare the efficacy of the procedure in question against alternative modes of treatment (for example, surgery vs. physical therapy).

To be effective, however, segmentation must also consider the risk factors that influence outcomes. There are at least two ways that risk must be factored into population segmentation. First, the population of patients suffering from a particular condition or disease will likely have sub-groups with different risk profiles. For example, within the broader population of all patients who suffer from diabetes, there will be some patients who suffer from multiple co-morbidities and others that do not. These groups will have different risk profiles with the co-morbid patients at risk of worse health outcomes than those who suffer from diabetes alone. In order to meaningfully compare the outcomes of two different providers in a given disease area, there will need to be robust techniques for risk-adjustment to adjust for patient mix.

The second dimension of risk concerns individuals who may currently be asymptomatic but who are at risk for developing a disease in the future. These individuals also represent distinct population segments that any population-based approach to healthcare must take into account. In some cases, social or demographic factors will be the most relevant segment category—for instance, the population segment of all newborns or the frail elderly—as such groups are likely to face similar health issues, pose unique challenges, or place special demands on the health system. In other situations, the key risks will be behavioral—for example, the population of heavy smokers. Whether or not the members of this segment are symptomatic today, their current behavior represents a key health risk going forward and requires certain types of interventions such as smoking cessation programs to minimize the risk of future illness. Finally, an
individual’s genetic profile may represent a key risk factor for certain population segments. As biomedical researchers accumulate knowledge of key genetic risk factors, certain risk groups are becoming well known—for example, the role of specific inherited mutations in the *BRCA1* and *BRCA2* genes in creating increased risk of female breast and ovarian cancers.

Leading healthcare providers have considerable experience with taking this population-based approach to care delivery. At Kaiser Permanente, for example, geriatricians have developed a “senior segmentation algorithm” that uses administrative and clinical data from the system’s electronic health record to categorize each member aged 65 years and older into one of four care groups with similar needs: those without chronic conditions, with one or more chronic conditions, with advanced illness or end-organ failure, or with extreme frailty or nearing the end of life. The algorithm and categorization system informs the care plan for each senior in the KP system, with a focus on slowing the progression into the higher-need segments over time.

**Customizing Interventions, Personalizing Care**

As the Kaiser Permanente example suggests, providers that track outcomes and costs for carefully defined population segments and learn more about the clinical interventions that improve health outcomes for a given segment are in a position to drive the systematic improvement of care by designing customized and increasingly precise interventions for each group and subset within the group.

Take the example of Martini-Klinik’s care for prostate cancer patients. Martini’s focus on improving health outcomes has driven volume. In the seven-year period from its founding in 2005 through 2011, the clinic nearly tripled its number of prostate cancer patients, making it the largest prostate-cancer center in the world and widely recognized as one of the best for research on prostate cancer and its treatment. The more data the clinic accumulates, the more it has been able to identify multiple sub-segments within the broader population of prostate cancer patients, do ever more sophisticated risk assessment, and define multiple care pathways for different categories of patients. The result: more precise and more personalized care depending on the specific risk profile of each patient.

Leading drug and medical technology companies are increasingly repositioning themselves to partner with providers in the development of more effective treatments that improve health outcomes. Drug companies are expanding their offerings “beyond the pill,” combining their drugs with a variety of value-added services, including more precise diagnostics, data and health-information services, and sometimes even care-management expertise and care delivery. For example, Novartis is pursuing this approach with its newly released heart-failure drug Entresto. The company is bundling the drug with add-on services to improve patient outcomes, including
remote-monitoring devices for early detection of signs of deterioration in heart performance. Novartis is also evaluating the use of internet-connected devices at home, such as scales and blood-oxygen meters to detect changes in fluid balances with the goal ultimately of improving health outcomes in the population of patients taking the drug.

Meanwhile, medical technology companies are beginning to integrate downstream and build fully integrated supplier and care-provision franchises. Device maker Medtronic, for example, is taking this approach to improving outcomes and lowering the costs of treating heart failure and diabetes. So is Germany’s Fresenius Medical Care in the domain of end-stage renal disease. Fresenius is the only medtech company that is active across the entire value chain—from selling equipment and dialysis supplies, to operating more than 800 centers providing peritoneal dialysis and hemodialysis, to manufacturing and marketing renal drugs. The company is also engaged in pilots in which Fresenius takes full responsibility for the myriad health issues that frequently afflict patients with end-state renal disease such as diabetes, cardiovascular disease, and chronic ulcers.

As healthcare organizations set more holistic goals for improving population health, however, customization has to take place along two critical dimensions. First, whereas traditional care delivery focused on diagnosis, treatment, and recovery and rehabilitation, a genuinely integrated value-based approach to care will reach upstream to include interventions designed to encourage prevention and downstream to include the long-term monitoring and management of patients with chronic disease. Second, interventions must move beyond the traditional clinical setting to include both behavioral and social interventions. Behavioral interventions include helping patients modify unhealthy behaviors (for instance, smoking, poor diet or the lack of exercise), comply with treatment guidelines, or increase their individual motivation and willingness to participate in care. Social interventions include addressing the kind of issues that have traditionally been understood as part of the separate public health system or social services—for example, access to housing, immigration status, food security, and other issues. For instance, Kaiser Permanente has recently appointed its first chief community health officer to oversee the roughly $2.2 billion the system spends annually on prevention-based community-health programs in its markets. In this respect, value-based healthcare represents a higher degree of alignment and integration of heretofore largely separate sectors: healthcare, public health, and social welfare.

An integrated approach to care delivery along the entire treatment pathway is not only a more effective way to monitor and treat patients. In addition to making possible better coordination across multiple stakeholders, and more integrated treatment pathways for the sufferers of a given condition or disease, it also allows health systems to have full visibility into the costs of the system and to make informed tradeoffs—for example, investing in preventive care in order to
avoid high treatment costs at later points in the value chain. (See Exhibit 3 for a summary of the patient-centric care delivery model for value-based healthcare.)

**Exhibit 3. Patient-Centric Care Delivery is the Centerpiece of the Value-Based Model**

Patient-centric care delivery model designed to optimize value for patients
- Standardized tracking of health outcomes and costs of care
- Carefully defined population segments (by diagnosis and risk profiles)
- Segment-specific interventions along the full cycle of care

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**A Preliminary Roadmap for System Transformation**

As some of the examples in this section suggest, leading providers in countries around the world are already implementing the value-based model of care delivery. But it is one thing for an individual provider to institutionalize the value-based model; it is quite another for an entire national health system to do so. The real potential of the value-based approach will be realized only when it is applied system-wide, at the regional, national or even international level. The bigger the population of patients for which there is extensive standardized outcomes data, the more powerful the insights clinicians will be able to draw about what interventions work best for which segments and sub-segments of patients. We have identified four phases in the evolution of value-based healthcare which can serve as a preliminary roadmap to system transformation:

- **Phase One: Internal Performance Improvement.** In this initial phase, individual provider organizations, pharmaceutical companies, and medical device makers begin measuring their contribution to healthcare value and reducing variation in health outcomes across all treatment and product categories much as Kaiser Permanente and Martini-Klinik do routinely today.
Phase Two: System Performance Improvement. Once a critical mass of providers in a national health system is actively tracking health outcomes and working to improve them over time, the next step is to focus on performance improvement across the entire health system. Here, the main focus should be on developing shared standards and the anonymous benchmarking of performance across and within health systems, with a focus on learning and continuous improvement. This is taking place today at many quality registries around the world.

Phase Three: Transparency and Value Competition. Once system-wide standards are in place and methodologies for outcomes tracking and risk-adjustment have been validated, the third phase will be to “go public” with the results. The public sharing of health outcomes data empowers patients to make informed choices among treatment options and among providers on the basis of the outcomes that matter the most to each individual patient. It also creates both financial and non-financial incentives for stakeholders to cooperate and compete on improving healthcare value. This is happening to a certain extent in some countries, such as Sweden, and in some disease areas at the international level (for example, in cataract treatment centers across Europe). But genuine competition over value is still relatively limited.

Phase Four: Value-Based Healthcare System. The fourth and final phase in the transition to value-based healthcare is the creation of national health systems that are fully optimized for continuous improvement in the value delivered to defined population segments. In such a system, outcomes data is being measured for all major patient and population segments. Data is made available to the public, in order to make informed decisions; to care providers, in order to benchmark their own results and make continuous improvements; and to academic and industrial innovators, in order to develop new knowledge and products. This phase will also see the development of more global centers of excellence such as Martini-Klinik in prostate cancer, a higher degree of provider integration similar to that found at Kaiser Permanente, and new business models that will enable closer collaborations among payers, providers, and suppliers.

The key for national health systems to progress across these phases is in the development of four key enablers of the value-based delivery model. We turn to those enablers in the next section of this report.
Four Key Enablers of Value in Healthcare

The transition to value-based healthcare will be greatly accelerated if health systems can align four key enablers: informatics; benchmarking, research, and tools; payments; and delivery organization.

Informatics

Value-based healthcare is a data-driven approach to care delivery. As such, a key component of any value-based healthcare system is a comprehensive informatics infrastructure that enables the routine collection, sharing, and analysis of the relevant outcomes data for each population segment along the full cycle of care. By informatics, we mean the combination of data standards, IT architecture, and analytic capabilities to support the systematic tracking and analysis of health outcomes and relevant risk-adjustment factors. The more that health informatics systems share common data standards and a common architecture, the easier it will be to share outcomes data across different databases and provider organizations.

A minimally sufficient architecture consists of six key components:

- Standardized outcomes metrics and cost allocation by population segment
- A universal data taxonomy across diseases and population groups (for example, a consistent methodology and scale for measuring pain or patient quality of life)
- Interoperability that allows databases to efficiently communicate with each other,
- The integration of outcomes data into the systems that clinicians use in their daily work—for instance, electronic medical records (EMRs),
- Mechanisms to link individual patient data across multiple databases (for example, a single personal identifier), and
- Robust governance processes with comprehensive rules for data access, agreements about data sharing, and guidelines for privacy management

Although there has been considerable progress in the development of health informatics in recent years, we are still relatively far from creating such an integrated informatics infrastructure. The
current marketplace for health-related IT systems and databases is highly fragmented. In many countries of the world, patient health records continue to be recorded and maintained on paper. And even in health systems where EMRs have become the standard for capturing diagnostic and treatment information for individual patients, off-the-shelf systems available today do not include structured and standardized data on patient health outcomes. What’s more, the procedures for entering and validating the data in EMRs is often less rigorous than those found in the outcomes databases of, for example, a typical quality registry. As a result, the data often have to be entered twice, first in the EMR as a part of everyday clinical routine, then again in a quality registry according to the well-defined data categories used by registries.

Another major problem is the general lack of interoperability across the many different health-related databases—EMRs, registry databases, financial reporting systems, lab data, biobanks, and the like—that stakeholders are creating today. In the absence of both system interoperability (technical specifications allowing different systems to communicate with each other) and semantic interoperability (shared data taxonomies that allow systems to exchange data with unambiguous, shared meaning), it is difficult to combine data sets with high accuracy, to draw meaningful inferences from the data, or use multiple databases for knowledge discovery.

A third obstacle is the relative lack in most healthcare organizations of people with the appropriate data-science skill sets to make use of the growing quantities of health-related data. Increasingly, stakeholders need personnel who can develop the appropriate analytic approaches to make sense of the data or need to partner with outside organizations that can do it for them. This capability is an important but often neglected part of a comprehensive informatics infrastructure.

Finally, legal and regulatory restrictions or the absence of certain legal requirements also hinders the development of the informatics infrastructure in many countries. For example, stringent data privacy laws can prevent the sharing of data. And in many cases, it is impossible to comprehensively track the data of individual patients across multiple systems and databases.

Nevertheless, some leading providers have made extensive progress on building integrated informatics platforms. For example, as part of its comprehensive disease-based approach to care delivery, Kaiser Permanente has invested heavily in system-wide IT platforms with common standards across all providers and standard methodologies for risk stratification. KP has the largest advanced electronic-health-record implementation in the world that integrates each patient’s clinical record with appointments, ancillary services, and registration and billing, creating a complete healthcare business and management system that enhances the quality of patient care. Finally, the system integrates data from KP’s extensive databases that track outcomes across its patient population. The existence of this integrated informatics
infrastructure allows the organization to analyze outcomes at the level of specific population segments, identify variations in outcomes or costs, and codify and share best practices for specific segments that then become the foundation for new treatment protocols. This infrastructure is a critical enabler allowing KP to continuously improve the healthcare value it delivers to its members.

Some countries are also making progress at the national level. For example, the Dutch Institute for Clinical Auditing (DICA), a non-profit funded by the Association of Health Insurance Companies in the Netherlands and managed by that country’s professional medical societies, functions as a provider-neutral aggregator of outcomes data on the national level for 23 Dutch quality registries. DICA provides technical support (including methodologies for risk-adjustment and statistical analysis), a standardized process for determining the relevant outcomes metrics for a given condition, standardized data formats so data is comparable across providers, and rules for data access and anonymization to ensure patient privacy.¹⁶

There has also been considerable innovation in the rapidly evolving health informatics space which is generating a variety of new sources of data and new solutions to the data-integration challenge. Digital health applications are leveraging wearable devices and social media to collect new data, translate the data into information in order to provide insights to doctors and personalized recommendations to patients, and connect with patients to mobilize engagement and adherence to care protocols. Cloud-based applications are allowing startups to collect real-world evidence from cancer patients on the precise impact of cancer drugs, helping pharmaceutical companies better understand patients’ medical needs and accelerate the delivery of effective therapies. And new approaches to data architecture are creating more effective ways to aggregate data from disparate databases with different architectures and data standards. Examples include so-called data lakes (in which raw data is stored in its native format and data structure and requirements are not defined until the moment of use) and blockchain, a new type of data structure that makes it possible to share data among distributed networks of computers without the need for any central authority.¹⁷

All these innovations are rapidly expanding the “art of the possible” when it comes to integrating health data around the patient. In the near term, these developments are contributing to the fragmentation of the health-informatics landscape. Over time, however, through the adoption of critical standards, we believe they will become integral components of the comprehensive informatics infrastructure for value-based healthcare.
## Benchmarking, Research, and Tools

Once health systems begin to routinely track and share outcomes data by condition and population segment, the resulting accumulation of data will become a powerful asset for driving research and innovation in healthcare through more systematic benchmarking, new types of research, and the development of sophisticated decision-support tools. In this model, highly granular data about health outcomes will increasingly help clinicians identify the most effective interventions and therapies for a specific population segment. In this respect, value-based healthcare has the potential of creating a dynamic learning system at an international scale with faster identification and adoption of superior clinical practice.

**Benchmarking.** Leading quality registries are moving in this direction already, resulting in what one might term the “industrialization” of traditional practices of clinical observation. The systematic collection of detailed information on health outcomes makes it possible to identify variations in outcomes across clinical sites, analyze the root causes of those variations, and codify best practices (that is, practices that produce the best outcomes). Through systematic benchmarking, quality registries around the world are identifying effective treatments and important clinical innovations and, then, spreading them rapidly through the health system, reducing outcomes variation and improving average health outcomes.

Sweden’s cataract registry, for example, used its growing database of cataract surgeries both to identify patients at risk for postoperative endophthalmitis, a rare but debilitating surgical complication with close to a 50% risk of blindness, and to determine the best clinical practices (for instance, prophylactic administration of an antibiotic) to prevent it. As a result, the average Swedish ophthalmology clinic delivers results on par with those of the best ophthalmic hospital in the US.\(^\text{18}\)

**Research.** Ever larger health outcomes databases can be used for more than merely the identification and sharing of clinical best practice. Through access to these databases, clinical scientists will be able to identify previously overlooked population variations in outcomes, which will guide the development of more precise diagnostics and ultimately increase appropriateness and accuracy of treatments.

The gold standard in clinical research is the double-blind randomized controlled trial (RCT). RCTs assess a new clinical procedure or new drug therapy on the basis of a rigorously designed comparison between two populations of patients in which neither researchers, doctors, nor patients know who is receiving the specific therapy being tested and who is receiving the control treatment.
With the growing availability of high-coverage registry databases, researchers are in a position to do RCTs as part of normal clinical practice using existing registry-based data capture (known as registry-based RCTs, or rRCTs). Clinical centers participating in the registry can randomize patients in normal clinical practice into one treatment arm or another. These high-volume rRCTs have dramatically lower cost than traditional clinical trials—as low as one tenth—because the assembling of the patient sample is completely integrated into routine care. They also test a representative population of patients, as narrow inclusion or exclusion criteria are typically not applied.

rRCTS are a highly effective means to test the medical efficacy of not only potential new practices and treatments but also existing treatments. For example, a team of Swedish, Danish, and Icelandic researchers recently used this approach to evaluate the effectiveness of coronary-artery thrombus aspiration, a technique which is increasingly used along with percutaneous coronary intervention (PCI) for patients suffering from ST-segment-elevation myocardial infarction (STEMI), a type of heart attack. The study found that routine thrombus aspiration before PCI did not significantly reduce mortality and, therefore, did not contribute to healthcare value.¹⁹ The New England Journal of Medicine recognized the design of the study as a “new paradigm” for conducting clinical trials and a potential “disruptive technology in clinical research.”²⁰

Registry-based trials may also have the potential to generate significant improvements in the efficiency of drug development. RCTs are essential to the process by which the safety and efficacy of drug candidates are assessed. But the process is extremely expensive—Phase III trials in the biopharma industry are responsible for roughly 30% of total R&D costs. If regulatory authorities would allow some of these studies to be done through rRCTs, savings would be substantial. What’s more, as scientists learn more about the genetics of disease and population heterogeneity, drugs are being targeted at ever smaller populations of individuals who share the same risk profile. That development is a central part of so-called precision medicine, but it poses the additional challenge that, while trial sizes can be smaller, finding the appropriate patients for the trial sample can be much more difficult. Registry data on health outcomes in a given population segment provides a way to identify such patients and research drug effectiveness in real-world populations of patients. (See the sidebar “The US Cystic Fibrosis Registry.”)

**Decision-Support Tools.** In the future, we envision that researchers will analyze large databases of all patients treated for a given disease to develop algorithms that will help clinicians identify those clinical interventions that are likely to be most effective in any individual case. Improved health outcomes are the product of defining the right interventions for the appropriate population segment. The more structured, high quality data clinicians have on both, the more benefit they
The US Cystic Fibrosis Registry

Cystic fibrosis (CF) is a rare disease, occurring in less than one of every 3000 newborns. That rarity makes it challenging to research the disease and develop improved treatment guidelines. Since the mid-1960s, the US Cystic Fibrosis Foundation, a patient advocacy group, has managed a quality registry that collects systematic outcomes data on all U.S. patients suffering from the disease. Today, more than 28,000 living patients are enrolled in the registry, which collects data from more than 120 certified cystic fibrosis centers in the US. The work of the CF registry has been instrumental in improving the average life expectancy for a newborn diagnosed with cystic fibrosis from three years in 1964 to forty years today.

The registry publishes comparative data on the performance of all CF centers and has a comprehensive quality engagement program to reduce outcomes variation. A “learning and leadership collaborative” provides coaching to physicians with 90% participation across centers. Patients and their families are included in these improvement initiatives as part of multidisciplinary teams.

In addition to helping CF centers improve their outcomes, the CF registry also collaborates with patients to encourage adherence to treatment plans and to assess the overall value of care. Physicians have found that sharing CF registry data with individual patients can enable frank dialogue about the implications of patient behavior for future survival and help patients understand how they can influence the life cycle of their disease. In the future, the registry hopes to further understand obstacles that patients face and equip patients with knowledge, skills and resources to overcome them.

The CF registry has also invested in research partnerships with biotech companies to discover new therapies to cure cystic fibrosis. By using national registry data for clinical trials, the registry has found that drug approvals can be accelerated by as much as 3 to 4 years, because the registry’s extensive genetic profiles of CF patients makes the identification and tracking of a relevant study population far easier to do. The registry has participated in clinical trials of new antibiotics and helped conduct drug effectiveness research to see which medications and treatments yield the best outcomes. These projects have even become an income stream for the registry as it has earned revenue from licensing its data for post-marketing and Phase IV clinical-trial information and through royalties and rights collected on new drug that were approved on the basis of research using registry data.
can reap from decision-support tools that will help them choose the most appropriate intervention for any individual patient. The systematic measurement of outcomes will enable the assessment of how well current treatments match population segments and contribute to the development of ever more precise treatments.

**Payments**

The ways that healthcare providers and suppliers are compensated can be either a major obstacle to or enabler of value-based healthcare. There are three problems with current approaches to payment that constitute serious barriers to the value-based model of care delivery.

In many cases, current payment mechanisms create disincentives for improving healthcare value. Consider the perverse economic impact of how complications are reimbursed at US hospitals. An analysis of net revenues, fixed costs, and variable costs associated with more than 34,000 surgical inpatient procedures at a major US hospital system found that privately insured surgical patients who had one or more complications provided hospitals with a 330 percent higher profit margin (an additional $39,000 per patient, on average) than those who had no complications. Medicare patients with one or more complications produced a 190 percent higher margin (an additional $18,000 per patient). In other words, the reimbursement system made it economically irrational to improve healthcare value by minimizing complications.

But even when payment mechanisms are not actively discouraging improvement in healthcare value, there remains a fundamental disconnect between the ways providers are paid and the health outcomes they deliver. This isn’t only the case with the traditional fee-for-service compensation model which has been widely criticized for leading to overtreatment and to the fragmentation of care chains. It is also the case for alternative models of provider compensation. Take the example of capitation. In theory, capitated payments should encourage more investment in preventive medicine because the more a provider network can limit costly secondary and tertiary care, the better its compensation for a given patient population. But unless clinicians are focused on improving health outcomes—and have the data available to inform their decisions—capitation can easily become an incentive for undertreatment, especially if the likely savings from increased prevention will only be realized over a long time period.

A third problem in current approaches to compensation and reimbursement is that national health systems rarely take a holistic approach to payment across the full cycle of care. Because the costs and the benefits are split up, incentives are not aligned. Take the example of prevention. One of the reasons it is difficult for current health systems to focus on prevention is that many of the costs come out of the national healthcare budget whereas many of the benefits accrue to the national social insurance budget in the form of savings on unemployment benefits, disability
payments, and the like, resulting from a healthier workforce. Because in most nations no public agency or government body is taking a holistic view of the full cycle of care, systems don’t make the appropriate trade-offs necessary to improve value in health. In health systems that feature multiple payers, the problem is exacerbated by patient churn—the tendency of patients to move from one insurer to another over time. If an individual payer is unlikely to reap the benefit of prevention because patients move on to other insurers, why invest in it in the first place?

**Factoring Value Into Reimbursement.** As more health systems focus on value, however, payers have begun to address some of these issues and introduce a value-based component into compensation and reimbursement. In Sweden, the Stockholm County Council, the public entity responsible for funding care for the roughly 2 million residents of the greater Stockholm metropolitan area, has leveraged Sweden’s extensive network of disease registries to become a leader in the development of value-based models for reimbursement. (See the sidebar “Value-Based Payments at the Stockholm County Council.”)

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**Value-Based Payments at the Stockholm County Council**

Stockholm County Council (commonly known by its Swedish acronym SLL) is the public entity responsible for funding healthcare for the roughly 2 million residents of the greater Stockholm metropolitan area. SLL has leveraged Sweden’s extensive network of disease registries to become a leader in the development of value-based models for reimbursement.

The council has piloted bundled payments for cataract surgery, hip and knee replacement, and spine surgery in which the level of payment depends, in part, on the actual outcomes achieved. In the hip and knee replacement model, providers are financially responsible for the full cycle of care, including all diagnostics and any non-acute complications related to the primary surgery for up to 2 years after the operation. In the first two years of the program, complications decreased by 18%, reoperations decreased by 23%, and revisions fell by 19%. What’s more, costs per patient declined by 20%, and patient sick leave by 17%.

SLL has also begun to use quality and cost data to steer patient volumes to the most cost-effective providers and hospitals. One such hospital is Capio S:t. Göran, a private hospital in central Stockholm and one of Sweden’s largest emergency hospitals. Capio’s prices are 9% lower than those of nearby public hospitals, despite the fact that salaries and other employment terms are the same and quality is high. Capio has achieved this cost advantage through rigorous performance measurement, full public transparency of the hospital’s score on key quality indicators, and strong clinical leadership in championing outcomes-focused healthcare.
The US federal government’s Centers for Medicare and Medicaid Services, which oversees the Medicare and Medicaid health insurance programs and is the world’s largest public payer, has a stated goal of shifting 50% of the agency’s payments from fee-for-service to value-based models by 2018. (See the sidebar “Moving Beyond Fee-For-Service at the Centers for Medicare and Medicaid Services.”)

### Moving Beyond Fee-For-Service at the Centers for Medicare and Medicaid Services

The US federal government’s Centers for Medicare and Medicaid Services, commonly known as CMS, is the world’s largest public payer. The agency oversees the Medicare and Medicaid health insurance programs which together cover some 130 million people, about 40% of the US population, at a budget of roughly $1.2 trillion per year, which represents about 36% of the total annual US national health expenditure. CMS has traditionally paid the vast majority of doctors who see Medicare and Medicaid patients on a fee-for-service basis. But it has set a goal of shifting 50% of the agency’s payments from fee-for-service to value-based models by 2018.

Before the agency introduced any new reimbursement schemes, it focused on putting the appropriate quality metrics in place. In 2013, CMS completely redesigned the metrics it uses to track physician performance, eliminating the vast majority of traditional process metrics and gradually replacing them with relevant metrics intended to better reflect the quality of care. Although providers do not have to use the recommended metrics, there are strong financial incentives to do so. The agency also launched a series of programs to increase transparency and compare quality at more than 80% of CMS hospitals. In 2015, the agency began streamlining its existing physician quality incentive programs in order to help bridge the shift to value-based payments. These changes alone have had a major impact on healthcare value. CMS estimates that 80% of hospitals have improved their outcomes since 2007.

Once this tracking system was in place, CMS announced in early 2015 its plan to start shifting progressively to more value-based reimbursement. The approach, akin to “rapid prototyping” in the product-development world, sets broad goals, funds a number of pilots, and then adapts the pilots as new issues and unanticipated problems emerge. The approach helps manage the risk for providers in shifting to the new system. In 2015, CMS also established the Healthcare Payment Learning and Action Network to support stakeholders in adopting value-based payments and analyzing the results.

Among the models that CMS is testing are simple quality bonuses within a traditional fee-for-service model, value-based bundles for discrete episodes of care, and full-fledged value-based
Capitation in the form of so-called medical homes (a team-based care-delivery model that provides comprehensive and continuous care to patients with an emphasis on prevention and wellness), and integrated accountable care organizations (ACOs) that take full responsibility for providing care to a specific population of patients and receive a capitated population-based fee with the possibility of significant bonuses if health outcomes are improved.

Today, approximately 30% of Medicare payments are made through these alternative models, covering about 16% of providers and 44% of the Medicare population.

Coming up with mechanisms that factor value into compensation for drugs is a more challenging task. Typically, drug prices are negotiated with payers. But the best judges of whether drug companies are improving value through the provision of new diagnostic or care-management services are patients, in dialogue with their providers. The absence of mechanisms for assessing the impact of drug therapies on value has led many companies to hold back from developing novel approaches and broader offerings.

Despite this obstacle, a great deal of experimentation is going on. Drug companies are partnering with payers to develop outcomes-based payment schemes for innovative new drugs. For example, Novartis has signed value-based payment deals with US payers Cigna, Aetna, and Harvard Pilgrim for its new heart failure drug Entresto. In the deals, the payers will receive rebates on the price of the drug if it does not deliver specific health outcomes (for example, a reduction in heart-failure hospitalizations) agreed in advance. Harvard Pilgrim has similar deals with Eli Lilly for its Type-2 diabetes drug Trulicity and with Amgen for its new cholesterol drug Repatha.

Whatever form value-based reimbursement ultimately takes, it is highly unlikely that there will be a one-size-fits-all solution. Rather, the type of value-based reimbursement must fit to the specific needs of a given population segment. In some contexts—for example, most primary care settings or for chronic diseases such as diabetes—capitation, adjusted for population risk, with some kind of outcomes-based component will be the most appropriate model. In situations where it is easy to define discrete episodes of care—for example, surgeries such as knee or hip replacements—the value-based bundling model will be the way to go. And in still other situations—trauma care, for example—it may make sense to retain the traditional fee-for-service model or, alternatively, to combine a fixed budget with volume-based compensation. In short, value-based reimbursement will likely also need to be patient-centric and look different depending on the condition, the population segment, and the nature of the care delivered.
As industry stakeholders pursue these and other approaches, however, there is an important caveat that they should keep in mind. The ways that healthcare providers are reimbursed and compensated isn’t the only—or even necessarily the most important—incentive shaping their behavior. In the value-based model, outcomes transparency itself is the biggest driver of improvement in health outcomes because it harnesses clinicians’ natural desire to do the best for their patients. National health systems need to be careful not to corrupt the focus on outcomes improvement as a core value by tying it too closely to strong financial incentives.

**Delivery Organization**

As value-based healthcare progresses beyond the current stage of individual pilots or initiatives, healthcare systems need to reconsider how providers and care delivery networks are structured. To drive improvement of value for a given population segment, the design of care pathways and the goals of the system require alignment both within individual providers and across the entire care chain.

Most care delivery networks are currently organized around functions. First, provider organizations are typically divided between primary, secondary, and tertiary or quaternary care. In theory, this structure allows patients to find the most appropriate treatment setting based on their condition. Primary care focuses on basic population health and prevention, as well as caring for the chronically ill. Then, depending on the uniqueness or severity of a patient’s condition or the need for specialized care, patients are referred to secondary and tertiary or even more-specialized quaternary care centers. Too often in practice, however, each unit of the care chain is managed separately and incentives for clinicians at the various levels often conflict.

So too inside the typical hospital. Departments are usually organized by medical specialty: cardiology, thoracic surgery, rheumatology, radiology, and so on. In many hospitals, resources that are shared by all departments such as emergency care, intensive care, and surgery are likewise organized into their own specialty units. Despite the high degree of formal interaction among departments through referrals for diagnostics or treatment, each unit is measured on its own budget and its own organizationally distinct KPIs. What’s more, incentives are typically not shared across departments or care units.

This highly functional organization structure made sense in the era when the primary means of improving healthcare delivery was to increase the specialization and unique expertise of a hospital’s clinicians and when the choices among diagnostic and therapeutic alternatives was far simpler. But it is increasingly dysfunctional today. The independence of separate specialized units makes it extremely difficult to optimize the full care pathway and manage costs in an integrated fashion. Although individual-unit performance and costs can be tracked, no one unit
typically has responsibility for the health outcomes of a given group of patients across the entire care chain. There can even be negative financial incentives for the clinicians in one unit to collaborate with those in another.

In order to shift to the patient-centered population-based model of care delivery, some care delivery organizations are putting in place new roles and new organizational structures that encourage coordination across the full cycle of care and encourage the rational choice of treatment location based on the tradeoff between costs and the expertise needed for the best possible health outcomes.

**New “Integrator” Roles.** The first step is the introduction of new roles within the existing care-delivery organizational structure. Take for example the recent trend toward using care managers to monitor and coordinate the health needs of chronically ill patients. In the US, a small integrated care provider called CareMore has pioneered this approach on the basis of a network of small decentralized clinics staffed by nurse practitioners. These so-called care managers closely monitor and manage the care of chronically ill patients, often the frail elderly. In effect, they serve as *integrators* who in collaboration with primary care physicians and specialists, provides wraparound services, supported by proprietary assessment tools, predictive models, longitudinal data, and an integrated IT system.

Many hospitals are also investing in the creation of similar integrator roles. Typically, this involves some kind of matrix organization in which clinical experts within the traditional functional organization are formally assigned the integrator role, with the responsibility to take a horizontal view of the entire experience for a given patient group. Such patient-group “owners” report simultaneously to line management and to a senior executive for value-based healthcare who has a cross-departmental perspective.

But some organizations are going further, embracing fundamentally new organizational structures designed to encourage multidisciplinary coordination and integration across the entire clinical pathway for a given population segment or disease category.

**Integrated Providers.** One organizational model is that of the integrated provider institution that takes responsibility for whole patient health in a given geographic population across primary, secondary, and tertiary care. These integrated providers manage the population for maximum health-care value and, to a large extent, manage their own integrated care chains. But they will also act as brokers, helping their patients to navigate to the best independent providers, which align their approaches with the integrated providers’ systems and provide unique capabilities.
One form this new model is taking is institutions that fully integrate both the payer and the provider roles as Kaiser Permanente has done. In the US, for example, a number of private payers are forming closer partnerships with provider networks or, in some cases, acquiring them outright in order to move directly into care delivery. At the same time, many providers have begun to launch their own health plans. There are currently 150 provider-owned health plans in the US, with approximately 10 to 20 new entrants each year. This type of industry-driven consolidation may be one way that the value-based model begins to spread.

**From Medical Functions to Disease-Based Organizations.** A parallel organizational trend is the shift from a functional organizational structure based on medical specialty to one based on conditions and population segments. For example, in 2008, the Cleveland Clinic underwent a major reorganization in which it jettisoned a structure organized around traditional medical disciplines in favor of a new structure based on multidisciplinary institutes organized by disease areas. These institutes combine medical and surgical departments for specific diseases or somatic systems. All are required to publish outcomes and measure costs. Cleveland Clinic has integrated care through shared protocols and use of electronic medical records. The change has allowed the Cleveland Clinic to take a more patient-centric approach to care and to achieve the cooperation and alignment necessary to improve outcomes and treatment efficiency by taking a holistic view of costs along each treatment pathway.

**Focused Players.** Other more specialized providers are pursuing an organizational model known as the *integrated practice unit* or IPU.\(^{22}\) They are developing focused offerings that take advantage of economies of scale to provide the full range of care for patients suffering from a single condition or disease. Martini-Klinik in prostate cancer and Aravind Eye Care System in cataract surgery are the classic examples.

**Value-Adding Suppliers.** Increasingly, suppliers are also providing a broad array of value-added services to take increased accountability for improving outcomes and reducing costs for sufferers of a given condition or disease. Take the example of Medtronic in diabetes care. Through its acquisition of Diabeter, a Netherlands-based diabetes clinic and research center dedicated to providing comprehensive and individualized care for children and young adults with diabetes, combined with digital tools that enable links between the patient and physician to encourage self-management, and care managers assigned to each patient, Medtronic has achieved improved outcomes and lower costs over the annual cycle of care. Similarly, Medtronic has acquired the Dutch Obesity Clinic, NOK, to implement a multidisciplinary network with expertise to help patients with morbid obesity maintain long-term weight loss and reduce co-morbidities. The company continues to establish new capabilities to support additional value-based healthcare programs, including a new Hospital Solutions unit to operate
cardiology catheterization labs within hospitals as well as integrated tele-health and patient services to monitor and prevent escalation of chronic disease.

In the future, we expect all these players to interact with each other much more closely than they do today in extended health networks and ecosystems. For example, Kaiser Permanente has partnered with Fresenius Medical Care to provide its renal-failure patients with comprehensive, high-quality care—an example of the kind of partnerships that we see as an important characteristic of future provider networks. For providers pursuing this strategy, risk management will be a crucial capability, and access to high-quality data and analytics will be critical. (See Exhibit 4 for a summary of the four enablers of value-based healthcare.)

Exhibit 4. Four Key Enablers Support Value-Based Care Delivery

<table>
<thead>
<tr>
<th>Enabler</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informatics</td>
<td>• Tools for high-quality data collection along the full cycle of care enabling adequate population segmentation, measurement of value, and optimization of patient interventions and treatment</td>
</tr>
<tr>
<td></td>
<td>• Adequate technical interoperability and links between systems, enabling efficient and consistent data capture, analysis, and sharing</td>
</tr>
<tr>
<td></td>
<td>• Agreement on common standards to secure semantic interoperability across data sets</td>
</tr>
<tr>
<td>Benchmarking, research, &amp; tools</td>
<td>• Well-managed access to high-quality data and global benchmarking to drive system-wide learning, meaningful research and innovation, and continuous improvement in value</td>
</tr>
<tr>
<td></td>
<td>• Communication and transparency enabling comparison of common outcome and cost metrics, identification of variations, and selection of best practices</td>
</tr>
<tr>
<td></td>
<td>• Availability of core applications and tools for patient engagement and data-driven decision support allowing care providers to most effectively utilize medical knowledge</td>
</tr>
<tr>
<td>Payments</td>
<td>• Reimbursement schemes that incentivize improvement in outcomes and appropriate care</td>
</tr>
<tr>
<td></td>
<td>• Payments and risks are shared among providers and suppliers along the care chain for better cooperation and optimal use of resources</td>
</tr>
<tr>
<td>Delivery organization</td>
<td>• Case for change to motivate systems toward focusing on value; led by clinician engagement</td>
</tr>
<tr>
<td></td>
<td>• Organizational context (roles and incentives) designed to support delivery of value-based interventions</td>
</tr>
<tr>
<td></td>
<td>• Change management and roadmaps with priorities and sequencing of key steps, including training and adoption and the spread of best practices to enable continuous improvement</td>
</tr>
</tbody>
</table>

The Enabler Transformation Roadmap

How can industry stakeholders accelerate the development of the four key enablers for value-based healthcare? There are four steps, which correspond to the four phases of the transformation roadmap described in the previous section.
• **Phase One: Internal Performance Improvement.** The first phase focuses on individual providers and other stakeholders putting the basic building blocks in place to enable the organization to improve healthcare value. Enormous progress can happen simply by getting started. For instance, organizations shouldn’t wait until common outcomes standards are developed for every single disease or medical condition or until technical standards for a national IT infrastructure are entirely in place. They can begin today to track outcomes, create quality registries, benchmark their internal performance, and even experiment with new alternative payment models. Even the most rudimentary approaches can represent a big step forward. In our experience, when delivery organizations start systematically tracking health outcomes, it often unleashes clinician engagement and commitment to improving healthcare value, because the new focus on outcomes stimulates clinicians’ natural desire to do the best for their patients and because clinicians themselves are deciding the outcomes to be tracked. Thus, these initial efforts also start reorienting the organization to the long-term organizational change process that value-based healthcare requires.

• **Phase Two: System Performance Improvement.** As value-based healthcare moves to the system-wide level, however, the issue of shared standards and new mechanisms for continuous improvement and clinical coordination will have to be addressed. During this phase, health systems will need to rethink the organization of care delivery to improve coordination around patient groups. Governments will also have a leadership role to play. Key tasks in this phase include: adopting regional or national informatics strategies, encouraging—and perhaps even mandating—anonymized benchmarking across provider organizations, providing incentives to encourage a shift away from fee-for-service as the dominant mode of payment and new regulations to encourage the creation of genuinely coordinated networks of care with shared goals and incentives.

• **Phase Three: Transparency and Value Competition.** As health systems gain more experience with tracking outcomes and using them to improve healthcare value, a third phase will focus on making outcomes data transparent to the public at large and creating an environment where stakeholders can both cooperate and compete around their ability to deliver value. In this phase, IT systems will need to be sufficiently interoperable and include robust methodologies for risk-adjustment to make the data meaningfully comparable across providers. Here, the model may be what is happening today in countries such as Sweden or the Netherlands that have extensive networks of quality registries and shared IT platforms for collecting and sharing data.

Once the use of outcomes data for purposes of benchmarking is broadly established, national health systems can also begin to leverage the data for clinical research. And as
national systems spread the use of value-based bundles and capitation, they will be in a position to understand the precise impact of these new payment mechanisms on healthcare value, to develop mechanisms to prevent cherry-picking of the healthiest patients, and to use value-based payment to create financial incentives for continuous improvement in the health system. Finally, as coordinated care networks increasingly compete with each other on their ability to improve healthcare value, national or international interest groups will need to put quality programs in place to help laggards improve their performance and, in this way, raise the quality of care across the entire system.

- **Phase Four: Value-Based Healthcare System.** The end-point of this transformation process is a robust set of enablers supporting a comprehensive value-based healthcare system. An integrated informatics infrastructure will simultaneously guarantee patient data integrity and privacy and enable access to data for research and development. In a world in which younger generations are more comfortable with sharing personal data and information, the ultimate solution may be to let patients both collect and own their own outcomes data and set the terms for its use. Innovative technical solutions such as blockchain may provide both the right level of security and a high degree of interoperability for those with rights to access.

Such solutions will make it possible for researchers to have routine access to large data sets. Registry-like databases will be used to conduct fast and cheap clinical trials to prove product or service effectiveness for regulatory approval. And the data accumulating in outcomes databases will serve as the foundation for the regular development of new decision-support tools and new clinical guidelines.

The final phase in the transformation of payments will arrive when national health systems have a granular understanding of which value-based payment mechanisms are most appropriate for improving value in a given disease area or for a specific population segment. Payment options will be governed by a comprehensive legal and policy framework for value-based reimbursement that defines a discrete set of different payment models that are appropriate for different patient profiles and treatment situations, including models for payment of suppliers that encourage cooperation between providers and suppliers.

Finally, health systems will be reorganized around population segments with clearly defined and differentiated integrated treatment pathways available for all those who suffer from a given condition or disease or who share the same risk profile. There will be
a growing number of both national and international centers of excellence in key disease areas.

(See Exhibit 5 for a summary of the enabler transformation roadmap.)

**Exhibit 5. The Enabler Transformation Roadmap**

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal performance improvement</td>
<td>System performance improvement</td>
<td>Transparency and value competition</td>
<td>Value-based healthcare system</td>
</tr>
<tr>
<td>Data collection by individual stakeholders</td>
<td>Standardized measurement of value</td>
<td>Interoperable IT systems with risk adjustments</td>
<td>Increased patient data collection and ownership</td>
</tr>
<tr>
<td>Comparisons within organizations only</td>
<td>Anonymized benchmarking among organizations</td>
<td>Competition based on public reporting requirements</td>
<td>Decision support tools and new clinical guidelines</td>
</tr>
<tr>
<td>Experimentation with new models</td>
<td>Shift away from fee-for-service</td>
<td>Quality improvement efforts with bundled payments &amp; capitation</td>
<td>Value-based reimbursement</td>
</tr>
<tr>
<td>Increasing clinician engagement and ownership of value</td>
<td>Coordinated care across care chain</td>
<td>Quality improvement programs</td>
<td>Reorganization around population segments</td>
</tr>
</tbody>
</table>

Getting to that end-point is a long journey, one that will look different depending on a particular stakeholder or country’s starting point. In some cases, for example, these four phases will overlap and even take place in parallel. But whatever the particular starting point, national health systems need to start setting the vision and creating a framework so stakeholders can move as quickly as possible through this evolution. Since healthcare is such a highly regulated industry and because, in many countries, the government is the most important healthcare payer, creating enabling public policies will be especially important. We conclude our report by describing the policy agenda for value-based healthcare.
The Role of Public Policy

Given the size, complexity, and heavily regulated nature of the healthcare sector, perhaps the most important enabler in the transition to a value-based healthcare system is aligned public policy.

As the previous sections make clear, stakeholders across the healthcare industry are engaged in myriad initiatives to improve healthcare value. But as they do, they are running up against barriers that retard further progress. In this respect, the shift to value-based healthcare is what economists call a collective action problem. Although improving healthcare value is a goal that all stakeholders in the industry can aspire to, there are disincentives and risks built in to the current system that make it difficult for individual stakeholders single handedly to achieve that goal.

For this reason, government has a central role to play in enabling and providing the incentives of a value-based healthcare system. If the goal is to create a healthcare industry where players can both cooperate and compete on value, then government must set the rules and define an appropriate legal and regulatory framework to allow such cooperation and competition to emerge. In particular, there are five things that governments need to do:

1. Mandate health outcomes tracking and set standards for data collection and transparency.

Systematic tracking of health outcomes is the foundation of any value-based health system. Such tracking depends, first, on the definition of standardized outcome metrics and clear guidelines for the creation of fully interoperable outcomes databases so patients can be followed across providers and disease categories. The most important thing that policymakers can do to accelerate value in healthcare is to facilitate and eventually mandate health outcomes tracking.

Currently, all nations mandate at least some health-outcomes reporting—for example, basic mortality statistics. A few, for example the UK and Germany, have more expansive mandatory requirements. Most quality registries, however, collect and report data on a voluntary basis. This approach works fine in nations such as Sweden where there is a strong consensus among providers to collect and share data on the national level and where between 2011 and 2015, the federal and regional governments invested approximately 1.5 billion Swedish kronor (about €160 million) to extend that’s country registry network and to develop new tools for making use of outcomes data to inform clinical decision making and to make data easily available to patients.
But in countries where such a consensus does not yet exist, government can play a facilitating role—either by creating incentives to encourage providers to track outcomes or by legally obliging them to do so.

We believe that all healthcare providers should have an “obligation to report” the health outcomes data of for the population segments for which they are responsible. Think of this as the healthcare equivalent of the financial disclosures required of all public companies in their filings to regulatory authorities. Among other things, that means adopting standardized outcome metrics, building standardized, interoperable information systems for tracking those metrics across providers, and sharing the results so that their outcomes can be meaningfully compared with those of other providers.

Some providers may resist what they perceive as a new reporting burden, especially if it comes on top of all the other data they are currently required to report. We are sensitive to this concern. The solution is to follow the example of what CMS has done in the US: to streamline the amount of metrics providers are required to track so that they are squarely focused on outcomes that matter to patients. Once those metrics are in place, others metrics such as many process metrics can be eliminated. In the end, the total reporting burden should be reduced, not increased.

2. Balance the trade-off between patient privacy and data sharing.

As governments move toward mandated outcomes tracking, a key issue policymakers will need to resolve is to set an appropriate balance between the competing goods of patient privacy and the sharing of outcomes data for benchmarking and continuous improvement and for research and development. In some cases, a too-stringent approach to data privacy can make it difficult or even impossible for industry stakeholders to share data for the purposes of benchmarking, research, continuous improvement, and innovation.

Governments will need to establish guidelines for data integrity and security, processes for shared governance, rules for access, and methodologies for anonymization so that data can be shared in the aggregate without violating the privacy of any individual patient. For example, the EU General Data Protection Regulation establishes a legal framework for enabling the secure processing of health data. The regulation defines a shared framework for defining key personal, health, and genetic data; mandates standards for the collection and processing of the different types of data; and includes safeguards and protections for patient privacy. The regulation also defines the rights of individuals to be informed of data breaches, to have access to one’s personal data, and to opt out of data collection. The regulation creates a unified framework to simplify data interactions across the many countries that belong to the EU. Policymakers can also learn a
lot from the practices already established by quality registries that have been safely sharing
aggregate and anonymized patient data for years.

3. **Enable cooperation, coordination, and partnerships along care pathways while protecting against conflict of interest and focusing competition on value.**

Healthcare value requires the creation of customized interventions across the full cycle care. As such, it requires extensive coordination and partnerships among multiple stakeholders and clinical experts. Sometimes, however, existing conflict-of-interest rules, designed to prevent fraud and abuse, can make it hard for that cooperation to take place. For example, in the US, there are laws preventing physicians from referring patients to diagnostic centers or other healthcare facilities in which the physicians have a financial interest. Such laws are a necessary constraint on self-dealing, but they can also prevent the kind of coordination required in a value-based health system—for example, by prohibiting hospitals from rewarding providers that order less expensive treatments. There may be other, more effective ways to protect against financial abuse—for example, value-based bundled payments—while also allowing for increased coordination across the full cycle of care.

Policymakers need to craft new rules and regulations to encourage necessary coordination while also safeguarding against inappropriate collusion. Take for example the February 2014 directive of the European Union to encourage value-based purchasing in the procurement process for medical supplies. The directive allows public authorities to consider full life-cycle costs rather than just the up-front purchase price in the procurement of medical supplies and provides more freedom and flexibility to contracting authorities by shifting the tender process away from "arms-length" negotiation and toward closer collaboration with suppliers to develop proposals showing how their devices or supplies will lower the total costs of care.

Will such cooperation necessarily hinder competition in healthcare? We don't think so. It is a false choice to assume that national health systems must choose between cooperation and competition. Rather, the challenge is to create a context where providers and their partners can compete on delivering value to the patient as opposed to on simply maximizing market share or offering the lowest price per procedure. In some situations, stakeholders will cooperate with each other in value-adding partnerships; in other situations, they will compete to provide the best value to patients at the lowest cost. A value-based health system will combine aspects of both cooperation and competition.
4. Encourage and establish new longitudinal reimbursement models that support improvement in patient value.

As discussed earlier, traditional payment and reimbursement schemes can be significant obstacles to value-based healthcare. Not only are they not linked to outcomes; in some cases, they create actual disincentives to improve healthcare value. And in countries such as the US, the Netherlands, and Germany that have multiple insurance systems, frequent patient “churn” (the movement of patients from one insurance company to another) can provide a strong disincentive to invest in prevention.

Both as a payer and as a regulator, there is a great deal that government can do. A simple step is to remove legal and regulatory barriers to value-based compensation models. For example, Germany has recently eliminated certain legal provisions favoring fee-for-service payment that prevented payers and providers in that country from initiating value-based compensation schemes. Public payers can also actively support new models for value-based compensation as the Stockholm County Council is doing in Sweden and CMS is doing in the US. In all these models it will be critical to put mechanisms in place to prevent the manipulation of patient mix (cherry-picking) to improve outcomes results. Auditing methods also need to be implemented to secure accurate reporting.

Over the long term, policymakers need to define new funding models, potentially including cost-sharing that support meaningful screening and preventive care. The government of Singapore, for example, has engaged in a variety of creative mechanisms for financing a healthcare system that emphasizes prevention as a way to improve population health and minimize expensive care. In 2015, a full 20% of total government health spending in Singapore was invested in social and economic development and in preventive measures. The government also has a policy that each generation must be able to finance its own healthcare expenses, thus freeing younger generations of the burden of financing care for the elderly. The government allocates resources upfront to each generation and uses mechanisms such as a compulsory health savings plan called Medisave in which employees contribute a percentage of wages to the accounts; meanwhile the government continually adjusts what the funds can be used for in order to incentivize the right behavior. The Medisave account has become a highly effective way for the government to get Singaporean citizens to take responsibility for their own health and invest in behaviors that support prevention.

Another creative approach is the use of so-called social impact bonds in which a government issues a contract where it agrees to pay a specified return for achievement of a specific social or health outcome. In the US state of South Carolina, for example, a consortium of philanthropic funders have committed $17 million (with an additional $13 million provided by Medicaid) to fund a program known as the Nurse-Family Partnership. The program pairs first-time, low-
income mothers with specially trained nurses, who support the mothers to have healthy pregnancies and become knowledgeable and responsible parents. The State of South Carolina will make up to $7.5 million in success payments if the program meets its goals, including reducing pre-term births, child hospitalization, and emergency department usage.

5: Enable pharma and medtech companies to take increased accountability for and to contribute more actively to improving healthcare value.

A fifth and final focus for public policy should be regulations that make it easier for pharmaceutical, medtech, and other innovative suppliers to contribute to improving healthcare value. One focus could be changes in the regulatory approval process. As nations make progress in tracking health outcomes, there is an opportunity to start testing the efficacy of new drugs, devices, and other products and services using "real-world" evidence with potentially large savings in the cost of Phase III clinical trials. Regulatory bodies should consider giving conditional approval for products that have already proven their safety in order to allow products to market for registry based trials (on the condition that all patients using the new products are monitored with standardized outcomes metrics). Such an approach could lead to the replacement of some expensive Phase III trials by more cost-effective registry-based RCTs.

Other changes could make it easier for pharma and medtech companies to compete “beyond the pill” and “beyond the device.” Currently, payers typically negotiate prices by product. Ideally, health systems should make it easier for providers to collaborate with suppliers in order to jointly develop (and be reimbursed for) solutions that improve value. However, the legal and regulatory environment can make such collaborations difficult to achieve. For example, in the US, current anti-kickback statutes require pharma companies to document and charge back the fair-market value of any added services or solutions delivered to customers of its pharmaceutical products. This requirement puts pharma companies at a disadvantage compared to entrepreneurial competitors outside the pharma industry that do not have this constraint and is an obstacle to their engaging in risk-sharing contracts with providers around the impact of their drugs on healthcare value.

(See Exhibit 6 for a summary of the role of public policy in value-based healthcare.)
Exhibit 6. Public Policy Needs to Create an Appropriate Legal and Regulatory Framework for Value-Based Healthcare

A legal and regulatory framework that eliminates barriers and enables value-based care
- Policy affects both the patient-centric delivery model as well as the enablers of value-based care

- Standardization of outcome measurement and transparency across provider and supplier groups
- Regulatory support where stakeholder coordination is required (for instance, EHR interoperability)
- Incentives in place for wellness and prevention of disease and individual accountability within the population
- Legal framework protecting patient integrity yet supporting quality data access for patients and innovators

<table>
<thead>
<tr>
<th>Measuring patient value</th>
<th>Population segments</th>
<th>Segment specific interventions</th>
<th>Informatics</th>
<th>Benchmarking, research, &amp; tools</th>
<th>Payments</th>
<th>Delivery organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentivize outcomes data collection and reporting</td>
<td>Collection and use of data on patient and population</td>
<td>Enable precision medicine by providing needed data access to outcomes data</td>
<td>Interoperability to support coordination across cycle of care</td>
<td>Reduce R&amp;D cost and speed up patient access by registry based randomized trials</td>
<td>Legislation enabling provider and supplier risk sharing</td>
<td>Regulation to enable provider collaboration while preventing fraud and abuse</td>
</tr>
</tbody>
</table>
Next Steps for the Value in Healthcare Project

In the first year of the Value in Healthcare project, we have aspired to demonstrate why value-based healthcare is a necessary vision for our future health systems. We have defined the case for change, provided a synthesis of best practices from case study examples, identified issues and barriers preventing reform, and outlined a preliminary roadmap for progression towards a mature value-based health system.

The work in 2017 will build on this foundation to sharpen the reform agenda, detail the roadmaps and address the challenges that will face policymakers and other leaders driving the change. Key themes will be practicality, real-world implications, and multi-stakeholder implementation. Our work in 2017 will also feature:

- Analysis and documentation of additional case study examples,
- A deep dive on informatics and digital tools to support value-based healthcare,
- The completion of system-level implementation roadmaps, and
- The planning and execution of system-level pilots in prioritized regions

Case studies. The first collection of Value in Healthcare case studies included nine health systems and organizations that exhibited best practices relevant to multiple elements of the patient-centric delivery model and the enablers. (For more information, see the appendix to this document.) In 2017, case studies will include more focused examples where organizations have achieved proficiency in a single element of the value-based healthcare framework. Likely focus areas include (but are not limited to): innovative payment models, implementation of costing methodology, the use of registry RCTs for regulatory purposes, and innovative data and IT systems. An additional category of case examples will present a forward-looking view on how new technologies could be leveraged to accelerate the pace of value-based healthcare reform—for example, the role of machine learning and predictive analytics. Once completed, the Value in Healthcare case study library will encompass best practices covering the past, present, and future of value-based healthcare. All cases will be accessible via the World Economic Forum and BCG websites.

Deep dive on informatics. In the first year, we have only begun to scratch the surface of the deep and complex landscape of health data and analytics. 2017 will draw upon the expertise of key stakeholders in the industry to achieve the following:
- Map key technical and legal barriers to effective management of patient outcomes and cost data and identify required changes in standards, incentives, and regulation

- Map and perform comparative analysis of existing data-capture, analysis, and sharing applications and standards

- Review opportunities to create major international data-repositories to support large-scale research and development programs—for example, how to manage the trade-off between patient integrity and data access

- Review integrated information systems that efficiently support clinical teams in their effort to drive improvement of patient value as part of normal clinical practice—what are best solutions today, what can we expect tomorrow?

**Roadmaps.** The four phases of the transformation roadmaps will support system-level change and hence require actions form multiple players within health systems. Moreover, given the diversity of systems, there will be no single roadmap that will function as a “one-size-fits-all” solution. Rather, a series of health system archetypes will be identified to respond to the key differences across systems. 2017 will also feature further description of the nature and sequence of events to address the key barriers that have been described in this document, including areas where public policy will play a pivotal role. In many circumstances, solutions will require unilateral action by a single stakeholder (for instance, governments, payers, etc); however, in others no clear action owner or owners is apparent. In 2017, we will seek to define where and how to drive multi-stakeholder alignment to secure implementation at a local, national, or international level.

**Pilots.** An enduring capstone of the Value in Healthcare project will be the execution of system-level pilots focused on implementation of the transformation roadmaps. Pilots will build upon the World Economic Forum’s ability to convene public and private organizations within a region in order to focus on a defined goal. The participation of local governments will be a firm requirement for any pilot proposal. The pilot process will begin with identification of an appropriate population segment within a prioritized region (emerging or developed economies). Subsequently, transformation roadmaps will be customized (through a series of workshops) to address the specific barriers present for the population while utilizing the unique capabilities in the region. Current plans suggest a portfolio-based approach including: one pilot in a region at the very beginning of its value-based-health-care journey; one pilot in a region where significant progress has been achieved, but where a final push is required; and one pilot in a very mature health system to serve as a proof-of-concept and best-in-class example of value-based healthcare.
A final goal for 2017 will be to lay the foundation for a self-sustaining network that will allow healthcare leaders to share best practice and learn from each other while driving system reform towards value-based healthcare. By disseminating learnings from case studies, creating a digital platform for knowledge sharing, driving multi-stakeholder alignment on key actions in the transformation roadmap, and encouraging joint learning across pilot initiatives, we hope to accelerate the process of long-term collaboration. The convening bodies and forums required for such sustained learning will be outlined at the end of the 2017 work. The Value in Healthcare project, thus, aspires to make a significant contribution to achieving the long-term health-system reform goals of the World Economic Forum and The Boston Consulting Group.
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7 A review of 3,000 interventions used to prevent and treat common clinical conditions found that approximately 50% were not supported by evidence of effectiveness. See “What conclusions have *Clinical Evidence* drawn about what works, what doesn't base on randomized controlled trial evidence?” *BJM Clinical Evidence*; available at: [http://clinicalevidence.bmj.com/x/set/static/cms/efficacy-categorisations.html](http://clinicalevidence.bmj.com/x/set/static/cms/efficacy-categorisations.html).


9 According to one estimate, combined 2015 spending on preventive care, personalized medicine, and public health was $534.3 billion, which represents only approximately 7% of total global spending on healthcare. See “2016 Global Wellness Economy Monitor,” Global Wellness Institute, October 2016 (available at: [www.globalwellnessinstitute.org/wellness-now-a-372-trillion-global-industry/](http://www.globalwellnessinstitute.org/wellness-now-a-372-trillion-global-industry/)).


For more information, see: [http://www.ichom.org/medical-conditions/](http://www.ichom.org/medical-conditions/).


Larsson, et al., “Use Of 13 Disease Registries In 5 Countries Demonstrates The Potential To Use Outcome Data To Improve Healthcare’s Value.”


