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Healthcare 2015 and care delivery

Delivery models refined,
competencies defined

Healthcare



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Healthcare 2015 and care delivery

Delivery models refined, competencies defined

By Jim Adams, Richard Bakalar, MD, Michael Boroch, Karen Knecht, Edgar L. Mounib and Neil Stuart

Healthcare providers can work collaboratively to achieve new milestones in defining, measuring and delivering value, activating responsible citizens and developing new models for promoting health and delivering care, even within growing resource constraints and other challenges. This is important more than ever before as the paths of healthcare systems in many countries are increasingly unsustainable. Moreover, we envision this will lead to a variety of strategic decisions affecting service delivery models and underlying competencies. These decisions could impact the organization's leadership, culture, business models, organizational structures, skills, processes and technologies.

Many countries are struggling to address increasing costs, poor or inconsistent quality and inaccessibility to timely care. Attempting to resolve these issues is daunting. And many believe the only cure is a fundamental transformation of healthcare.¹

Among developed countries, for example, healthcare expenditures are rising twice as fast as overall economic growth.² This is, in part, causing some governments to reduce coverage for certain services and to redirect spending among other programs, such as physical infrastructure and education. And while many citizens³ in developing countries are benefiting from higher disposable incomes

that enable access to higher quality care, the vast majority is increasingly unable to afford professional care as medical inflation rises.⁴

Meanwhile, countries face inconsistent care quality. High levels of preventable errors have been reported across hospitals in Australia, Canada, Denmark, France, New Zealand, Spain, the United Kingdom, and the United States, among others. Error rates range from 2.9⁵ to 45.8 percent⁶ for hospitalized patients (weighted average = 8.4 percent),⁷ of which 27.6⁸ to 51.2 percent⁹ were preventable. In the U.K., adverse events cost approximately €3 billion (US\$4 billion) per year in additional hospital stays alone, while litigation represents further substantial cost.¹⁰

Finally, as costs and demand rise, access to care is becoming more problematic. Many healthcare systems have demand versus capacity issues that are extending wait times for services. In response, some governments are intervening and pledging to cap wait times (such as Denmark and the U.K.). Other access concerns include serving the uninsured populations in countries with predominately private healthcare systems – for example, this group numbers 47 million in the U.S. (15.8 percent of total population).¹¹

These challenges are exacerbated by driving forces that are challenging the *status quo*: globalization, consumerism, changing demographics and lifestyles, diseases that are more expensive to treat (for example, rising incidence of chronic disease), and the proliferation of medical technologies and treatments. Other inhibiting forces include financial constraints, varying societal expectations and norms, misaligned incentives, short-term thinking and an absence of advanced information systems needed to provide invaluable analytics and insight. Dealing with these forces requires proactive, collaborative systemic responses.

Clearly, these challenges are neither the sole making nor responsibility of healthcare providers, though providers will be able to address some independently. Resolving others will require healthcare providers to lead, as well as participate in, proactive collaborative efforts that span stakeholder constituencies.

Assuming that healthcare systems can achieve comprehensive, “win-win” transformations in the next decade may be unrealistic. In some

countries, the challenges are too large and complex to address wholesale; other countries face tremendous resistance to changing social programs. Instead, we expect the following near-term changes that will impact the overall environment in which healthcare providers and other stakeholders operate:

- *Piecemeal, incremental approaches to healthcare change.* Successful piecemeal approaches will typically be multi-faceted in order to reach the critical mass needed to overcome structural barriers (for example, emphasize prevention in combination with rational coverage decisions and appropriately aligned incentives across key stakeholders).
- *A struggle to seek a viable balance in public and private healthcare spending.* Nearly all countries will move toward universal coverage that is limited by realistic tradeoffs and funding constraints.
- *An increasing portion of health-related financial responsibility transferred to citizens.* Health will be managed more like, and in tandem with, wealth.
- *The emergence of new and non-traditional local and global competitors and collaborators in care delivery to meet changing stakeholder needs.*
- *A proliferation of delivery models and capabilities,* driven in part by changing needs combined with new treatment approaches and technologies.

Given the increasingly unsustainable environments in many countries, care delivery organizations must begin now making a variety of strategic decisions affecting service delivery models and underlying competencies.

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Behind the need for change: Challenges and constraints

Healthcare systems must address the root causes of their predicament – rising costs, poor or inconsistent quality, or inaccessibility to timely care – as well the underlying drivers of globalization, consumerism, changing demographics and lifestyles, diseases that are more expensive to treat (including an increasing prevalence of chronic disease), and a proliferation of new treatments and technologies that are exacerbating the challenges.

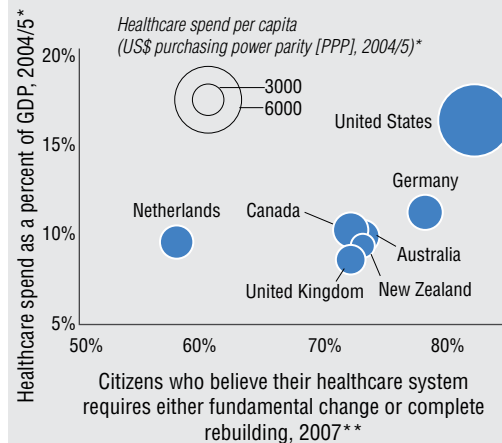
About this study

This study is an extension of “Healthcare 2015: Win-win or lose-lose?” which details the broad case for healthcare system transformation.¹² Since payers and providers should collaborate to address many of healthcare’s challenges, it is also linked to and consistent with another study on healthcare payers.¹³

In this paper, we explore how healthcare providers – care delivery organizations (CDOs, such as clinics, hospitals and regional health organizations) and individual clinicians (doctors and nurses, as well as midlevel providers, such as nursing assistants) – can better serve citizens/patients in the face of opportunities and constraints of evolving healthcare systems. We examine how key external factors will evolve and affect providers. Our study findings lead to the identification of key service models and five critical competencies needed for providers to implement those service models.

The need for change defies simple solutions, as illustrated by citizens’ dissatisfaction levels (see Figure 1). Some observers have suggested that more capacity and money is the solution, for example, but healthcare expenditures among seven surveyed countries in Figure 1 are among the highest in the world. Others argue that the healthcare system models for financing and delivering healthcare (public versus private) is the answer. However, these countries have similar problems even though they have different models for financing and delivering healthcare.

FIGURE 1.
Citizens’ satisfaction levels versus and overall healthcare spending.



Note: PPP accounts for purchasing power of different currencies. Source: *OECD, “OCED Health Data” (2007); **Commonwealth Fund, “2007 Commonwealth Fund International Health Policy Survey” (2007).

The aforementioned drivers are impacting healthcare providers in four areas:

- Greater focus on value from the entire healthcare system, including CDOs
- Increasing need to activate responsible citizens
- New approaches to promoting health and delivering care
- Growing resource challenges.

Redefining value – From “sick care” to healthcare

Transforming healthcare requires a corresponding transformation in understanding the value that care providers deliver. In many countries, the main focus of care providers is to diagnose and treat sick people. Although this is clearly valuable and necessary, a reactive healthcare system that is not engaged until a patient is ill incurs high – increasingly unaffordable – costs in caring for the illness.

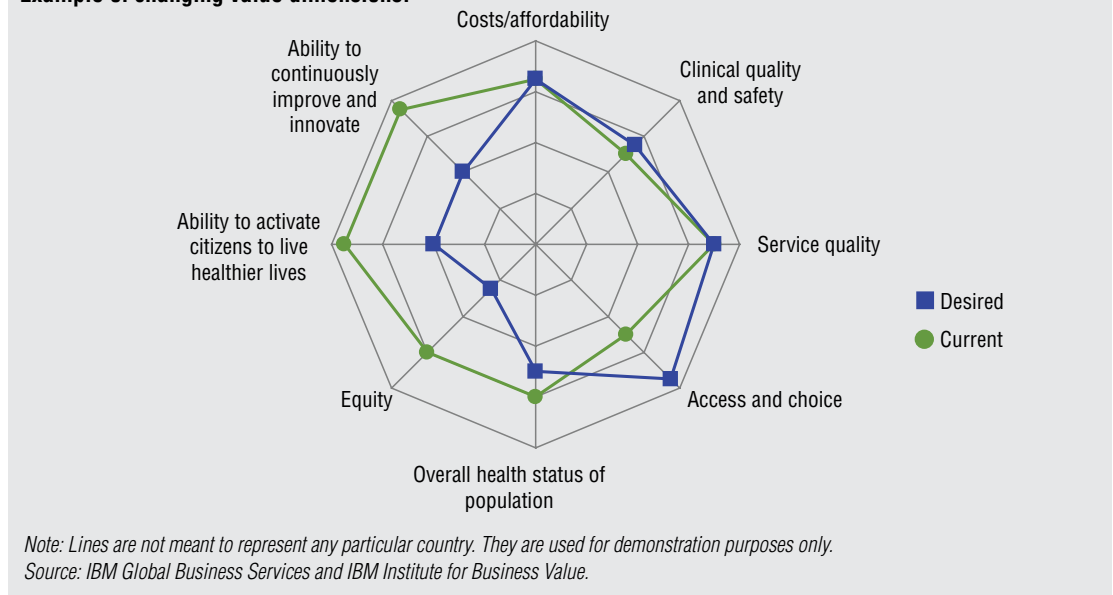
Additionally, the damage to health and functioning inflicted by many diseases, particularly in their more advanced states, cannot

be reversed. Restoration of full pre-disease health for those with chronic illnesses, for example, may be unattainable, regardless of the healthcare resources expended.

Sick care is a very expensive form of care. Consider chronic conditions, such as coronary heart disease, type 2 diabetes and cancer, which together account for more than half of the world’s disease burden.¹⁴ Reactive healthcare systems that primarily treat patients after the onset of disease incur tremendous costs. But, a system that is focused on proactive care strategies, such as personalized prevention, prediction, early detection/treatment and disease management, can help create and maintain a healthier population, possibly at a lower cost.

There are many components of value (“value dimensions”) in care delivery, each of which needs to be balanced against the others and considered when making systemic decisions (see sample representation in Figure 2). Value in other industries is typically a combination of product costs, product quality and service.

FIGURE 2.
Example of changing value dimensions.



The rate of diagnostic error is up to 15 percent and the cases physicians see as routine and unchallenging are often the ones that end up being misdiagnosed.

– Berner, Eta S. and Mark L. Graber.

“Overconfidence as a cause of diagnostic error in medicine.”

American Journal of Medicine.

Vol 121, 2008.

Healthcare systems also include value dimensions such as costs or overall affordability, clinical quality and safety, and service quality, as well as timely access and choice.

In the future, other essential dimensions could include: the ability to continuously improve and innovate, since both needs and capabilities will continue to evolve; to activate citizens to lead healthier lives; and to help ensure equity or fairness in the use of limited healthcare resources. And, there is the ultimate value of a healthcare system: its ability to maintain and enhance the overall health status of a country – a factor that supports individual and collective productivity and economic vitality.

Each value dimension should be carefully defined or redefined, and measured. Quality of care, for example, has been defined as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”¹⁵ Currently, measures for quality of care are generally focused on the outcome of episodic treatment and the approach, such as evidence-based medicine, used to produce those outcomes. These aspects of quality are important, but are frequently focused on treating illness.

There are other potential facets to quality care in a value-based healthcare system: the focus on prediction, prevention, and early detection and intervention; correct and timely diagnosis; the ability to educate patients in managing their conditions and health, and to communicate effectively to bolster patient comprehension, compliance, and recall; responsiveness to patient preferences and

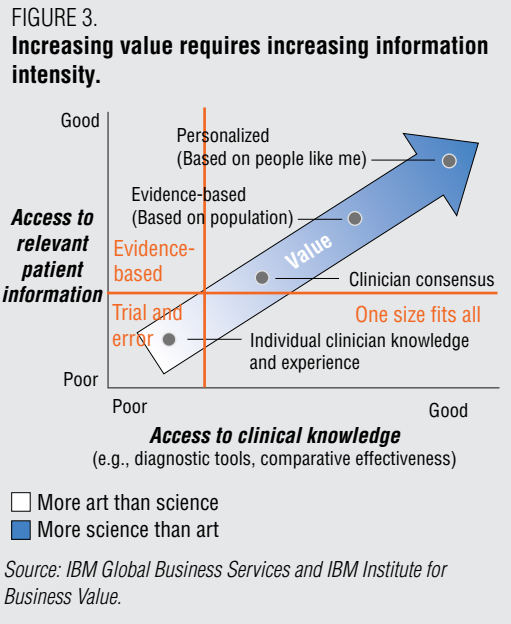
values, where appropriate; and the ability to coordinate care across venues, care providers and time.

For potential diabetics, for example, the focus and incentives should be on preventing the condition. If someone has diabetes, then the focus and incentives should be on successfully managing the disease with the patient to prevent its progression or even reverse its effects. Where the illness mindset prevails, the focus and incentives unfortunately may be on performing world-class foot amputations or kidney transplants for seriously ill patients.

In a value-based healthcare system, we need to know what works and then consistently apply the knowledge appropriately. Too frequently today, healthcare professionals do not have easy access to relevant clinical knowledge and patient information. As a result, they must rely almost exclusively on their own experiences in similar cases. This has been called “expert- or experience-based” or even “trial and error” medicine. But that is no longer sufficient.

Today, we need – and can have, through information technology capabilities – better access to ever-expanding, relevant patient information and clinical knowledge. Such access enables greatly improved capabilities to correctly and completely diagnose and treat increasingly complex conditions. The more we know about the patient and the appropriate treatment for that patient, the more likely that health promotion or care can be personalized and evidence-based, greatly increasing the likelihood that it will be safe and effective, rather than ineffective or even harmful (see Figure 3).

As CDOs improve their ability to capture and manage data, they can play a key role in developing this knowledge in real-world settings, thereby enhancing the understanding of what types of health promotion and care delivery truly provide value.



In summary, as healthcare systems increasingly focus on value, CDOs and clinicians need to collaborate with payers and other key stakeholders to appropriately define, measure and deliver value, and properly align incentives while maintaining a sustainable cost structure. Currently, many countries allocate a disproportionately small portion of their healthcare spending on research into what works. The U.S., for example, spends less than 0.1 percent (US\$1 of every US\$1000) of total healthcare expenditures on determining what works best.¹⁶ As CDOs improve their ability to capture and manage data, they can play a key role in developing this knowledge in real-world settings, thereby enhancing the understanding of what types of health promotion and care delivery truly provide value.

Activating citizens – From “fix me” to personal health management

Many citizens, the vast majority in some countries, remain unaware of and protected financially from inevitable healthcare costs arising from their lifestyle and healthcare

choices. In addition, many countries have gone to lengths to build healthcare systems to help ensure that personal means do not prevent people from accessing care.

One unintended consequence has been to encourage attitudes and behaviors that can be summed up as, “I want to live any lifestyle I choose and I want someone else to pay to ‘fix me’ when my health fails.” Today, these same countries are seeking the balance between encouraging individual responsibility for health and the use of healthcare resources on one hand, and maintaining equity on the other.

The blind reliance on publicly supported healthcare to compensate for individual health behaviors reflects an increasingly unsustainable and unrealistic position. Partly as a result of safer environments and better medical treatments, populations are aging. Increased longevity is resulting in a greater need for healthcare services, especially as the long-term consequences of unhealthy lifestyle choices emerge. At the same time, the financial burden of treatment is shifting to citizens as governments and employers struggle to manage rising costs, either through increased costs or reduced benefits. Citizen activation has to be a key part of the solution.

“Individuals must play a role in taking care of their own health, and therefore citizens’ and patients’ participation and empowerment need to be regarded as core values in all health-related work at the EC level.”

– Commission of the European Communities¹⁷

Citizens should make better lifestyle choices about health because these choices have a major influence on an individual's health status (Figure 4). We know, for instance, that approximately 80 percent of coronary heart disease,¹⁸ up to 90 percent of type 2 diabetes,¹⁹ and 30 to 70 percent of cancers²⁰ could be prevented or significantly delayed through lifestyle changes, such as proper diet, adequate exercise and not smoking. Citizens with chronic diseases can also lower their disease burden through good lifestyle choices and by appropriately participating in their care and care decisions.

Whenever feasible, citizens should also become more active in their own health decisions for more personalized, high-value care. In some cases, these are decisions that citizens previously made, but have become more complex due to the proliferation of care options; in other cases, decisions were left to providers.

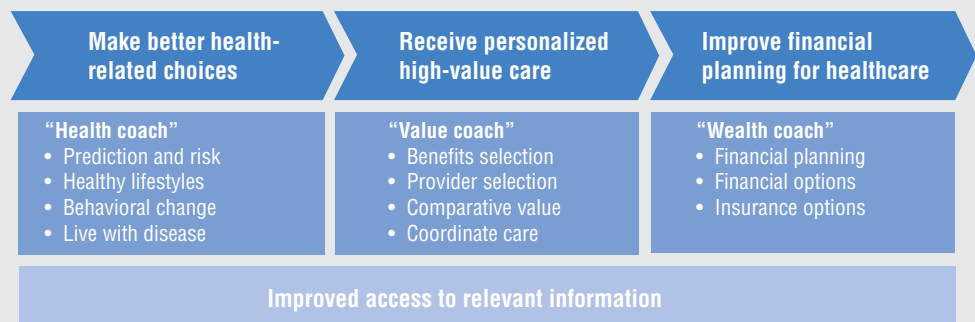
In a transformed system, the citizen and provider will “co-produce” healthcare. In situations where there is no universal best choice for care (for example, correction for myopia), clinicians can provide costs and

evidence of benefits and risks of viable alternatives (for example, glasses, contact lenses or laser eye surgery), and patients can make informed decisions based on their personal preferences.

Finally, citizens should plan for their growing financial responsibility for healthcare. However, a large proportion is unprepared. In the U.S., half of all bankruptcies are in part due to medical expenses.²¹ Twenty-four percent of Indians become impoverished due to medical crises.²² In Belgium, the financial liability for members of one health insurer is “exploding” as annual premiums could increase 200 percent.²³ And the proportion of Brazilian household income spent on healthcare is projected to increase from 5.35 percent in 2003 to 14 percent in 2025.²⁴

Clearly, citizens should begin planning for their physical and financial health. While CDOs may not help citizens plan for their growing portion of the financial burden for healthcare, they can expect citizens to become more discerning consumers of health-related services – and to struggle with paying for some services.

FIGURE 4.
Many citizens will need help in making wiser health and financial decisions.



Source: IBM Global Business Services and IBM Institute for Business Value.

Activating citizens to change behavior or to effectively navigate the healthcare system are difficult endeavors. Many citizens, regardless of how well-intended, will not be able to become activated, responsible citizens on their own.²⁵ As depicted in Figure 4, they may need help from a variety of coaches, who have access to the relevant information needed to provide good advice through a variety of channels (via telephone, the Internet or face-to-face, for example):

- “Health coaches” can help support citizens in their lifestyle decisions. These coaches can proactively help citizens understand the risks and predicted outcomes of their choices, and the attitudes and behavior on which a healthy lifestyle is predicated. They also serve as motivators and change agents as they help citizens achieve those healthy lifestyles or minimize the health impacts of diseases for which there is no cure.
- “Value coaches” can help support and advise citizens as they seek a more active role in care decisions. These coaches can play a critical advisory role in helping citizens navigate the many decisions that arise as they interact with the healthcare system, including the best choices among predictive and diagnostic tests, the appropriate providers and environments in which to seek care, and treatment choices. Also, in systems where private or supplemental benefits exist, value coaches can help citizens optimize their choice of benefits for each member of the family.
- “Wealth coaches” can help citizens bridge the gap between their healthcare needs and their ability to underwrite them. These coaches can proactively devise holistic healthcare, financial, and retirement plans, and advise citizens of their healthcare financing and insurance options.

Activating citizens includes developing an understanding of how behaviors and attitudes are changed, improving citizen access to information and clearly defining new and adjusted roles among providers and other stakeholders. James Prochaska’s Stages of Change model is a useful way to approach the work of helping activate citizens through behavior change.²⁶

Prochaska’s Stages of Change model contends that change occurs in six stages: pre-contemplation, contemplation, preparation, action and maintenance, ideally followed by termination rather than relapse. Changing citizen behaviors requires moving through each stage with the support of different entities – family and friends, support groups, care delivery teams, coaches or employers, for example – depending on the stage of change and the mindset of the individual. Additionally, governments, through policies and regulations, and the media, through implicit and explicit portrayals of acceptable social norms, can influence behaviors such as smoking or driving after drinking alcohol.

Changing human behavior, even temporarily, is quite difficult and sustaining the change is even more difficult. Roles and responsibilities in helping activate citizens in part through behavior change should be clearly defined among the aforementioned entities – including the care delivery team – to reduce confusing gaps and overlaps. Not all citizens will be willing to change, but with well-defined roles and responsibilities, and a clear awareness of individual differences, chances are better for helping citizens improve behaviors.

In summary, citizens can play important roles in increasingly value-focused healthcare systems by making better health-related choices, seeking and receiving personalized,

CDOs can play a key role in helping activate citizens – and that will be increasingly expected by the purchasers of health-related services such as governments, employers or individuals.

high-value care when needed and by appropriately planning for an increasing financial burden for healthcare. These changes will not come easily and may be exhibited in a number of behavioral and attitudinal changes such as appropriately sharing in decision-making, engaging in self-care and changing lifestyles.

CDOs can play a key role in helping activate citizens – and that will be increasingly expected by the purchasers of health-related services such as governments, employers or individuals. Equally important, activated citizens will become more informed and discerning consumers of health-related services that CDOs provide, with increasing expectations for low costs, high clinical and service quality, and convenient access.

New ways to promote health and deliver care

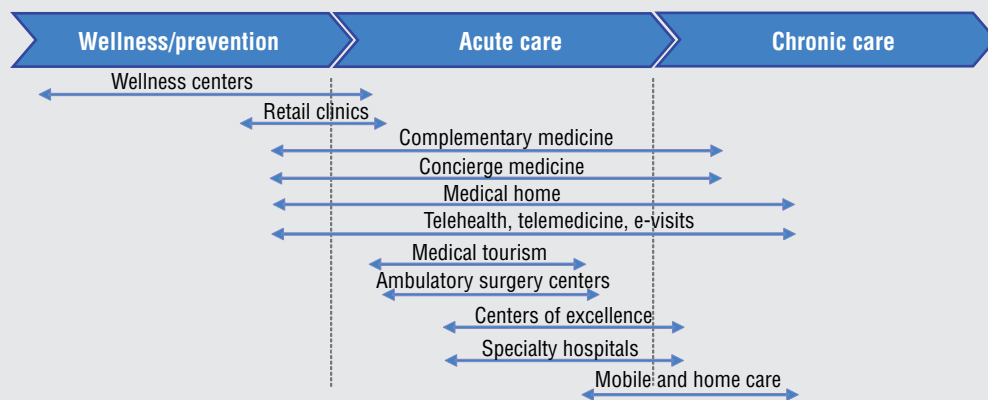
As the fundamental values and citizen behaviors within healthcare systems are altered and combined with increasingly complex medical conditions and increas-

ingly advanced diagnostics and treatments, providers must continue to respond to those changes with new approaches to promoting health and delivering care, or risk being left behind. Indeed, this process of adaptation to the new demands in the marketplace is occurring throughout the care delivery universe.

New provider business models are emerging that span the cost, quality and access gaps across the major forms of care delivery (see Figure 5). Many of these models are focused on acute care, which will remain important but will not solve the healthcare value challenge. There will be a need to coordinate and integrate many of these models, in addition to extending them more into preventive, chronic or even end-of-life services.

Countries such as the U.K. and the U.S. are witnessing the growth of “retail clinics” – clinics in retail stores – to help meet the demand for lower costs and more convenient access for certain conditions and needs. In acute care, ambulatory surgery centers are moving

FIGURE 5. Examples of evolving provider business models.



Source: IBM Global Business Services and IBM Institute for Business Value.

procedures out of the hospitals. In both acute and chronic care, telemedicine services and e-visits are being used to remotely monitor and consult with patients.

Citizens are increasingly demanding an integration of eastern and western medicine, and other alternative therapies. In the U.S., out-of-pocket spending for complementary and alternative medicine (CAM) exceeded US\$27 billion in 1997 – a sum comparable to all out-of-pocket expenditures for all American doctor services.²⁷ In Australia, CAM spending exceeded A\$1.8 billion (US\$1.3 billion) in 2004. And in Japan, it reached ¥2,358.6 billion (US\$20.3 billion) in 2004, a 17 percent rise from 2002.²⁸ This market is expected to exceed ¥5 trillion (US\$43.1 billion) in 2013.²⁹

Like other industries, care provision is going global. “Medical tourism” or “global healthcare” – the practice of citizens traveling beyond their local/regional boundaries for medical services – has expanded far beyond the traditional destinations in developed countries; it is estimated to be about US\$50 billion in 2007.³⁰ At least four medical tourist segments are emerging: “value shoppers” (active cost/quality consumers, regional patients, expatriates); “quality/experience seekers” (active but less price insensitive consumers); “leisure/business travelers” (consumers of services, ranging from cosmetic services to executive physicals); and “payer-directed” (patients who are mandated or incented by governments, private payers and employers)³¹

Overlaying virtually all of these models is the quest for more personalized healthcare. Personalized healthcare uses more complete information (for example, about the patient, disease states or responses to treatments)

to help predict, prevent and aid in early detection of diseases. Then it uses the patient’s unique physiology to help determine the best preventive or therapeutic approaches. Personalized medicine or healthcare means knowing what works, why it works and for whom it works, and applying that knowledge consistently for citizens and patients.

Personalized healthcare is still in its infancy and will likely pose major challenges for scientists, payers and CDOs as it progresses. CDOs will require new knowledge and skills (for example, the knowledge of the predictive or therapeutic capabilities of a variety of molecular tests) and major investments in IT-related capabilities (for example, access to both phenotypic and genotypic information combined with robust analytics capabilities).

In summary, the increasing focus on value and the increasing costs and complexity of diseases combined with new diagnostics and treatments will likely result in a continued proliferation of models to promote health and deliver care. The new models – or the need to coordinate or integrate the models – will increase the pressure for change on existing CDOs and the entire healthcare system. CDOs can choose to help collaboratively shape the future or risk becoming an outdated, decaying delivery model or, in the private sector, an obsolete brand.

Addressing resource challenges holistically

Concurrent with a proliferation of evolving delivery models, countries and CDOs are experiencing resource challenges, both financial and human capital. Human resource shortages include a 4.3 million shortfall worldwide in the supply of doctors, nurses and midwives, according to the World Health Organization.³²

New models, or the need to coordinate or integrate models, will increase pressure to change existing CDOs and the entire healthcare system. CDOs can collaboratively shape the future or risk becoming an outdated, decaying delivery model – or, in the private sector, an obsolete brand.

As more proactive, value-focused healthcare systems emerge, we can expect shortages in care professionals who are experts in strategies and techniques such as prevention, prediction, early detection/treatment, evidence-based medicine and care coordination. As value-based healthcare reduces the incidence of active disease, it is also likely that many healthcare systems will need additional – and more types of – primary care providers, and possibly fewer specialists. Even after incentives are realigned, long lead times be required to address these shortages.

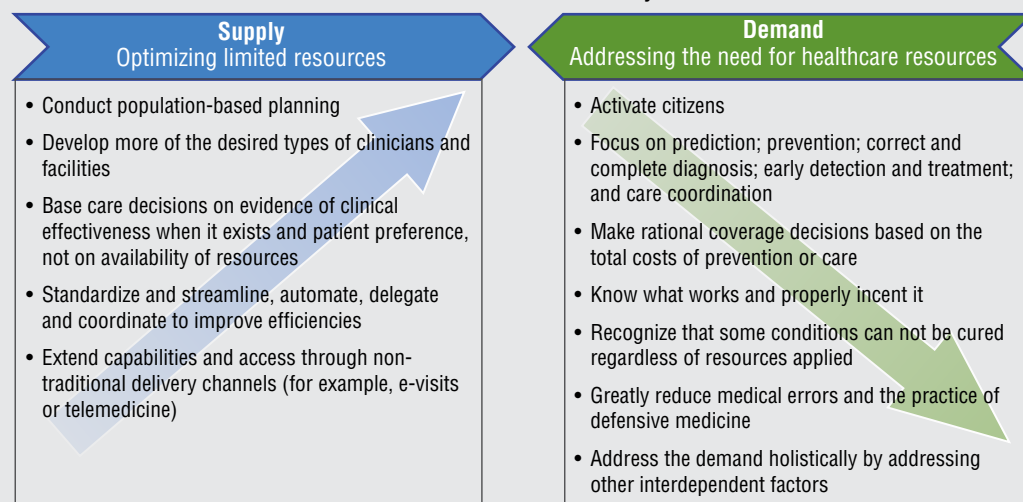
Today, a frequent response to help address clinician shortages is to import them from other countries. Ultimately, both healthcare supply and demand will have to be addressed to verify that the required healthcare resources are available to successfully transform healthcare systems (see Figure 6). While both the supply and demand recommendations may seem straightforward, they are not easy to implement.

Further exacerbating resource challenges is a fundamentally different set of demands from the time when many of today's solutions and approaches were implemented. For example, there is a significant and growing demand for healthcare that is about helping people get more enjoyment out of life. There is ample evidence of this in the growing citizen demand for sports medicine, cosmetic surgery and dentistry, and complementary therapies and alternative medicine – such as homeopathy, chiropractic, laser therapy and herbal therapy. We also see a rising number of medical responses to conditions associated with lifestyle, for example, gastric bypass surgery to address obesity and pharmacology to ward off type 2 diabetes.

To further complicate matters, we are trying to allocate the supply and manage the demand with insufficient evidence regarding effectiveness or comparative effectiveness of many, if not most, diagnostics and treatments.

FIGURE 6.

Longer term solutions to global resource shortages should address the supply and demand and be made in context of desired value dimensions for the healthcare system.



Source: IBM Global Business Services and IBM Institute for Business Value.

For example, many different treatments are available for back pain – surgery, chiropractic, acupuncture or physical therapy, to name a few – with little evidence of which treatments work best, for which patients, under which circumstances.

Seven implications of the shifting landscape

CDOs and clinicians should prepare for the shift to a value-based healthcare environment featuring greater citizen activation and new care delivery models, but under resource challenges. In reflecting upon these changes, some key needs emerge: to collaborate across stakeholders; for coordination and integration rather than fragmentation, driven in part by the increasing complexity of disease (for example, patients with multiple chronic illnesses) and treatment options; for transparency; and aligned incentives, to name a few.

These needs have significant implications for care providers across seven key areas (see Figure 7). The primary implications involve patient relationships, competitors and the nature of competition and differentiation.

Patient relationships. Historically, the relationship between a clinician, particularly a doctor, and a patient has been paternalistic – the doctor told the patient what to do and hoped the patient complied. These relationships will be reframed to partnerships, where clinicians work collaboratively with patients to promote health and treat or manage disease.

Additionally, health promotion and care delivery approaches need to be determined by evidence, illness level and patient preferences rather than by the individual experience of the clinician. This individual experience may be greatly influenced by treatment patterns, capabilities and capacities within a local geography, which typically leads to unacceptable variations in costs, quality and access.

Competition. CDOs will likely face a host of new, non-traditional competitors worldwide. This could include wellness centers, retail clinics, medical tourism centers or care delivered through telemedicine capabilities, for example.

Basis for competition and differentiation. Due in part to a lack of transparency and focus on value, market differentiation strategies have historically focused on dimensions such as geographic location or perceived clinical quality in treating primarily acute conditions. In a more transparent, value-based environment, differentiation strategies will also include documented value across new or redefined value dimensions (for example, the ability to provide end-to-end personalized, coordinated services for a medical condition) and new channels, as well as personalized prediction that is coupled with preventive care and early detection.

In examining these three primary implications, other implications become apparent. The remainder of this section will examine four additional implications that must be addressed to develop new relationships with patients in a changing competitive environment: innovation, culture, processes and information management.

CDOs and clinicians should prepare for the shift to a value-based healthcare environment featuring greater citizen activation and new care delivery models, but under resource challenges.

FIGURE 7.
The landscape for CDOs is changing.

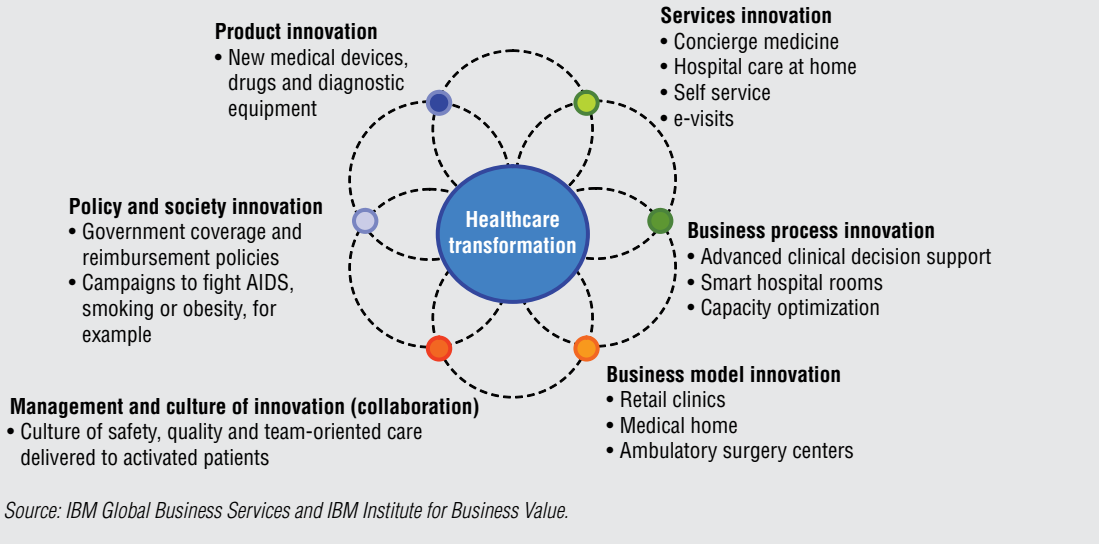
Factor	From (typical of today's environment)	To (typical of future environment)
1. Patient relationship	<ul style="list-style-type: none"> ▪ Paternalistic – Do things to patients to treat disease ▪ Prescriptive ▪ Geography or experience determines care 	<ul style="list-style-type: none"> ▪ Collaborative partnerships – Do things with patients to promote health, and treat or manage disease ▪ Knowledge sharing in decision making ▪ Evidence, illness level and preference determines care
2. Competitors	<ul style="list-style-type: none"> ▪ Primarily regional with some national competitors 	<ul style="list-style-type: none"> ▪ Regional, national and global ▪ Non-traditional, such as wellness centers and retail clinics
3. Basis for competition / differentiation	<ul style="list-style-type: none"> ▪ Location ▪ Perceived clinical quality ▪ Quality of service ▪ Access 	<ul style="list-style-type: none"> ▪ Documented, differentiated value (For example, cost, quality and access) ▪ Personalized, coordinated care delivery ▪ Prediction / prevention / early detection and treatment ▪ Channels/sites closer to the patient
4. Innovation	<ul style="list-style-type: none"> ▪ New medical technologies to generate additional revenue ▪ Basic research in academic medical centers 	<ul style="list-style-type: none"> ▪ Keeping people healthy ▪ Improvements to the overall value, quality and safety of care enabled in part by aligned incentives ▪ Rapid adoption of new knowledge and approaches through the use of clinical decision support tools
5. Culture	<ul style="list-style-type: none"> ▪ Individualistic ▪ Provider- or facility-centric ▪ Status quo / change-resistant 	<ul style="list-style-type: none"> ▪ Team-oriented ▪ Patient-centric, collaborative across organizational boundaries ▪ True continuous improvement and innovation
6. Processes	<ul style="list-style-type: none"> ▪ Manual ▪ Evolved ▪ Optimized for departments or facilities 	<ul style="list-style-type: none"> ▪ Electronically enabled / automated ▪ Designed, analyzed and managed ▪ Aligned with strategic vision and objectives, and optimized for enterprise and inter-enterprise needs
7. Information Management	<ul style="list-style-type: none"> ▪ Paper-based ▪ Non-standardized information ▪ Little knowledge of what works ▪ Fragmented with limited accessibility by the citizen and the clinician reducing value 	<ul style="list-style-type: none"> ▪ Electronic ▪ Standardized information supporting care delivery and analytics ▪ Evidence-based knowledge ▪ Shared, integrated or interoperable, accessible, secure and private, guiding clinical decisions at the point of care

Source: IBM Global Business Services and IBM Institute for Business Value.

Innovation. Albert Einstein's famous declaration that problems cannot be solved using the same level of thinking that created them holds true for healthcare. Healthcare transformation

requires the application of innovation – the intersection of insights and inventions – beyond its commonplace uses in academic research and product innovation (Figure 8).

FIGURE 8.
CDOs can lead or participate in multiple types of innovation.



To support successful transformation, providers will have to consider how to apply innovation to goals like keeping citizens healthy, speeding the development and adoption of clinical decision support tools, and improving the overall value, quality and safety of care.

Culture. Healthcare transformation requires sustainable change at many levels: ecosystem, organizational, departmental, work group and individual, for example. This type of change will not happen within CDOs without strong leadership and a clear vision – and an organizational change management plan. Organizational change defines new behaviors and norms, thus creating new norms for conducting business.

Currently, the culture in many healthcare systems may be individualistic, provider-focused and facility-centric, and highly resistant

to change. To prevent individuals, departments or even organizations from focusing on their own self interest – withdrawing and defending their separate, often conflicting, desires – CDOs need to become change-capable. Their cultures should embrace new tenets that encourage teamwork, a patient-centric focus, collaboration across organizational boundaries with a sense of shared accountability, and continuous improvement and innovation.

Processes: Total quality management guru W. Edwards Deming's 85/15 rule contends that 85 percent of a worker's effectiveness is determined by the system within which he works, only 15 percent by his own skill.³³ While the percentages can be debated, most would agree on the importance processes play in performance. Thus, the creation of new processes and redesign of existing processes will be necessary as CDOs and clinicians work together to transform care delivery.

Four implications that must be addressed to develop new relationships with patients in a changing competitive environment are: innovation, culture, processes and information management.

Currently, many care delivery processes are manual and designed at the functional or facility level. Further, they have often evolved over time with many additions, but include inefficiencies in workflow, costs and quality. These processes should be designed or redesigned, appropriately automated, analyzed and actively managed to make it easy and effective to do the right thing, and hard to do the wrong thing.

With regard to processes, providers pursuing transformation should:

- Expect process design to drive improvement, understanding that sub-optimal processes will limit performance no matter how hard and vigilant people are.
- Streamline and appropriately standardize processes, making them easier to learn and comply with and easier to monitor, with results that are easier to measure.
- Appropriately automate and delegate using tools and technologies such as robotics and information technology to raise performance and free human talent for patient interaction and care.
- Extend key processes beyond the department or enterprise to facilitate efficient and appropriate integration and coordination.

Information management. Finally, data, information and knowledge should facilitate the transformation of care delivery, but the exponential increases in sheer quantity have overwhelmed the capacity of many CDOs and clinicians – keeping up is a gargantuan task. The number of clinical trials alone has risen from approximately 200 in 1975 to over 30,000 in 2005.³⁴

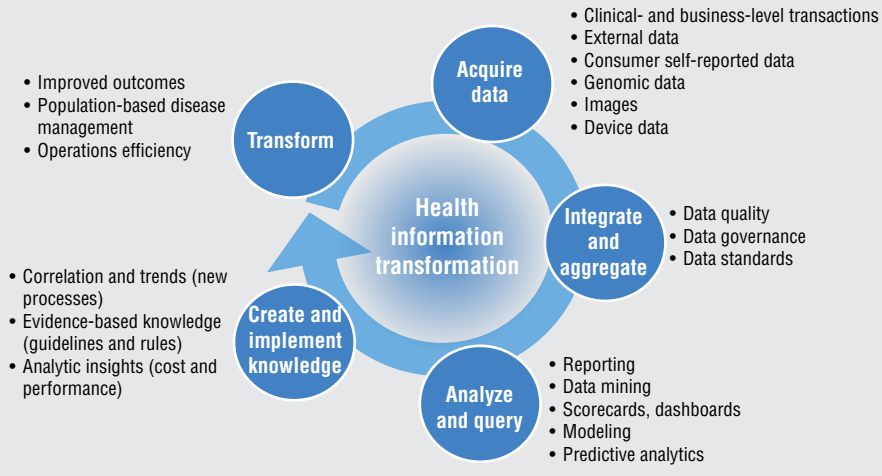
Non-standardized, largely paper-based systems frequently hamper care providers' ability to efficiently manage both patient information and clinical knowledge. Too often, empirical knowledge of what does and doesn't work in prevention, diagnosis and treatment is still lacking – it is estimated that only about 25 percent of care decisions are supported by evidence – and existing evidence-based knowledge tends to be fragmented and inaccessible.³⁵

The continued spread of electronic health records (EHRs) that can interoperate with other EHRs, citizens' electronic personal health records (PHRs), and other systems (for example, pharmacy systems), is one key to a successful transformation of care delivery. EHRs are needed to develop and standardize operations for managing clinical knowledge. For instance, EHRs can support alternative clinical trial designs in real-world settings, compare multiple conditions and treatment options, and track longer-term outcomes across multiple user groups.

Improved information management will help care providers create positive, self-reinforcing cycles of transformation as the insight gleaned from data collection and analysis creates change, and the outcomes of change create new data (see Figure 9).

FIGURE 9.

A positive, self-reinforcing cycle of information-driven transformation.



Source: IBM Global Business Services and IBM Institute for Business Value.

New models, new competencies – Recommendations for care providers

Historically, CDOs could declare broad and abstract targets, or even attempt to be “all things to all citizens” and still compete effectively. But in the future, we believe it will be harder to maintain an undifferentiated service delivery model, whether public or private healthcare system models.

The increasing focus on value, the rising need to activate responsible citizens, and the changing requirements of care delivery will force many CDOs to adopt and develop service delivery models with new and sharper strategic focuses. Regardless of their chosen service delivery models, CDOs will also require a core set of enhanced and expanded competencies.

Service delivery models

Most CDOs already fit into one or more of four generic service delivery models:

- *Community health networks*, focusing on optimizing access across a defined geography.
- *Centers of excellence*, focusing on optimizing clinical quality and safety for specific medical conditions.
- *Medical concierges*, focusing on optimizing the citizen/patient experience and relationship. The medical concierge concept is related to the “concierge” role in the hotel industry – someone who provides special services for customers. A medical concierge describes a CDO that differentiates, at least in part, based on the quality of its service.

Successful organizations will likely meet a threshold or minimally acceptable level of performance on all four service delivery models and differentiate on one or more models.

- *Price leaders*, focusing on optimizing productivity and workflow. For government-run or public CDOs, the “price leader” model may not currently be as relevant as for private CDOs, but a number of factors could change this. First, even in single payer models, purchaser-provider arrangements in which both public and private providers compete for public funding – in part to create competition – have been established. Also, medical tourism and the increasing prevalence of private insurers and private CDOs in historically government-run systems contribute to increasing relevance of the price leader delivery model. For both public and private CDOs, the focus on productivity and workflow improvements applies.

Each of these models places different emphasis on the value dimensions of access, clinical quality, service quality and cost. Successful organizations will likely meet a threshold or minimally acceptable level of performance on all four service delivery models and differentiate on one or more models. Larger CDOs may be able to perform above the threshold or even differentiate their capabilities from their competitors on multiple delivery models.

Even though they already exist, each model’s traditional focal points may be refined and in some cases, redirected or expanded to match the demands of a transformed healthcare environment (Figure 10).

FIGURE 10.
Evolution of service delivery models.

Service delivery model	Historical	Current and future
Community health network	<ul style="list-style-type: none"> ▪ Traditional physical locations and services 	<ul style="list-style-type: none"> ▪ Non-traditional locations (for example, home) and services (for example, prevention / wellness / health promotion) ▪ Electronic access and new channels (for example, remote monitoring, telemedicine)
Center of excellence	<ul style="list-style-type: none"> ▪ Focus on treating medical conditions at a specific care venue ▪ Compete primarily on reputation 	<ul style="list-style-type: none"> ▪ Focus on prediction, prevention, diagnosis, treatment and rehabilitation, and ongoing management of certain medical conditions ▪ Compete on documented quality and safety ▪ Change the definition of – and raise the bar for – quality through data-driven improvements and innovation
Medical concierge	<ul style="list-style-type: none"> ▪ Plush, amenity-rich facilities ▪ Friendly staff 	<ul style="list-style-type: none"> ▪ Comforting, safe, preference-sensitive facilities for patient and families ▪ Friendly, empowered (IT-enabled) staff ▪ Convenient, electronic access (for example, registration, e-visits) ▪ Patient-friendly administrative processes
Price leader	<ul style="list-style-type: none"> ▪ Streamlined processes ▪ Services centralized for economies of scale ▪ Focus on individual productivity 	<ul style="list-style-type: none"> ▪ Evidence-based, standardized processes ▪ Services performed at most cost-effective setting, fully exploiting IT-enabled capabilities ▪ Focus on team productivity and on activating patients

Source: IBM Global Business Services and IBM Institute for Business Value.

Clearly, as the healthcare system evolves, critical decisions will have to be made about more than just service delivery models – for example, what services will be provided and where the CDO fits in the continuum of care. These decisions and the service delivery models selected to implement them will, in part, determine the ongoing relevance of the CDO.

Five strategic competencies

Within a healthcare system, as the demands on care providers shift, so will the models for promoting health and delivering care to meet those demands. CDOs and clinicians will need to develop or improve a set of underlying competencies to successfully implement the service delivery models. All providers should develop five strategic competencies:

1. *Empower and activate citizens.* Help citizens assume accountability and make better, more informed health and lifestyle choices. For example, we expect that providers will hold behavior-focused discussions with patients and provide patients with decision aids for making preference-sensitive choices, where appropriate.

2. *Collaborate and integrate.* Promote health and deliver care across both traditional care venues (for example, doctor's offices, hospitals, labs or pharmacies) and non-traditional ones (for example, home or work locations). The collective focus across these venues would include appropriate interventions, care coordination and quality monitoring.

Such collaboration and integration can be facilitated through ownership of the disparate venues ("vertical integration"), or through partnerships or other relationships with like-minded organizations ("virtual

integration"). In either case, factors such as aligned incentives, robust information flow, transparency and a culture emphasizing value, team-oriented patient-centeredness and safety will determine success.

3. *Innovate.* Pursue innovation in operational processes, business models, services, organizational culture and products. For example, we would expect to see CDOs providing strong executive leadership and dedicated funding to projects aimed at breakthrough-level outcomes, as well as possibly undertaking first-of-a-kind initiatives to differentiate their service delivery models (for instance, smart hospital rooms or diagnostic and therapeutic care approaches supported by evidence-based advanced clinical decision support).

4. *Optimize operational efficiencies.* Pursue operational excellence, standardizing and streamlining end-to-end administrative and clinical processes. For example, providers would be mapping, monitoring, analyzing and improving key intra- and inter-enterprise processes to support new ways of implementing a delivery model.

5. *Enable through IT.* Implement enabling information technology, such as flexible applications, business intelligence and on-demand information, in order to achieve high-value care, efficient operations, and effective management and governance. In pursuing this final competency, providers might: adopt service-oriented architectures (SOAs) that support reusable, interchangeable services; analyze electronic clinical and administrative transactions to improve and standardize care approaches; and create electronic networks and interoperable applications to improve access to and sharing of information among clinicians and patients.

Each competency plays an important – and possibly different – role in enabling each service delivery model.

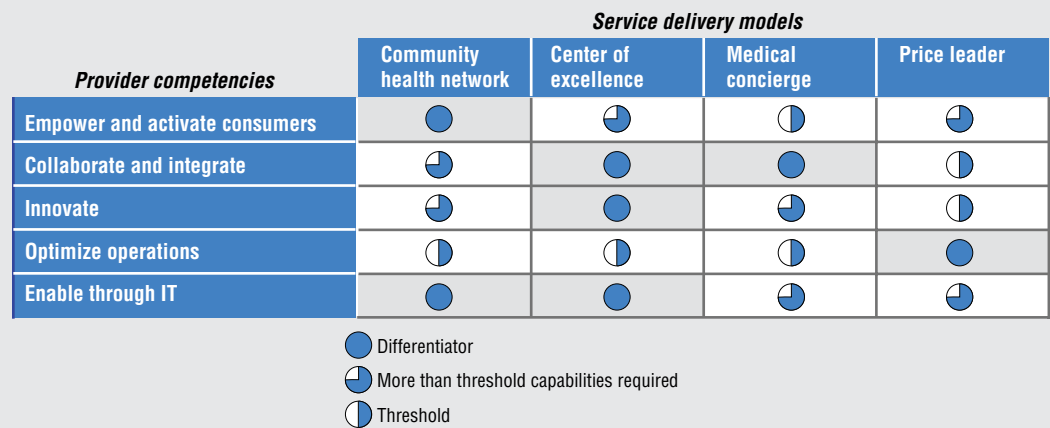
Service delivery models each require differing degrees of emphasis on these five competencies (see Figure 11). It is worth reiterating that each competency plays an important – and possibly different – role in enabling each service delivery model. For example, a community health network might utilize IT-related capabilities to optimize electronic access channels, while a center of excellence might instead utilize IT-related capabilities to drive data-driven improvements in the quality of care delivered.

In summary, we recommend that CDOs take the following steps:

- Fully recognize the need for and help shape a more patient-centric, value-based, accountable, affordable and sustainable healthcare system

- Identify the service delivery models and competencies necessary to prosper in the new order
- Assess their readiness for the competencies needed to implement the new or redefined service delivery models.
- Develop a plan to transition to the new delivery models – or new ways of implementing existing models – and develop the new competencies required to support the roles models. The plan could include key elements such as business models, organizational culture, skills and competencies, organizational structure, sourcing strategies, internal and inter-enterprise processes and IT-related capabilities.

FIGURE 11.
Refined service delivery models require different mixes of the five essential competencies.



Source: IBM Global Business Services and IBM Institute for Business Value.

CDOs and clinicians are at the epicenter of efforts to create more value-focused healthcare, in which health promotion and care delivery decisions provide evidence-based and increasingly personalized healthcare.

Conclusion

Status quo is not an option for healthcare systems in many countries. Increasingly, value-focused healthcare systems will emphasize new value dimensions – for example, the ability to activate citizens and the ability to continuously improve and innovate. They also will likely redefine existing dimensions – for example, quality metrics may increasingly emphasize prediction; prevention; early detection and treatment; time and resources expended for a correct and complete diagnosis; and care coordination.

CDOs and clinicians are at the epicenter of efforts to create more value-focused healthcare, in which health promotion and care delivery decisions provide evidence-based and increasingly personalized healthcare, appropriately based on patient preferences across preventive, diagnostic, therapeutic, and rehabilitative, end-of-life and palliative services. However, no single stakeholder created the current challenges and no single stakeholder can solve the problems. Active participation, collaboration and change will be required on the part of all stakeholders.

Change will not come easy for CDOs or for other key healthcare stakeholders. CDOs must develop new or redefined service delivery models and develop new competencies to implement those models, which could require a new leadership, culture, business models, organizational structures, sourcing strategies, skills, processes and technologies.

CDOs must also work collaboratively with other stakeholders to develop rational coverage decisions and appropriately align incentives

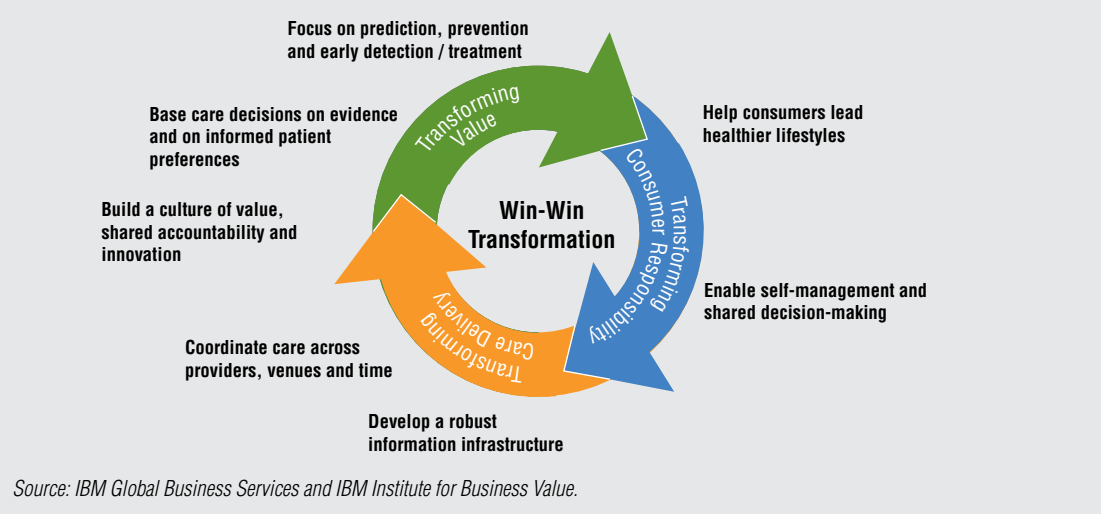
in an open, transparent atmosphere where comprehensible information about costs, quality and evidence prevail, and in many countries, a much more robust information infrastructure will be needed to facilitate transformation. Adding to the challenge, these changes must be implemented within constraints such as sustainable cost boundaries. Ultimately, the transformation of health systems will require commitment and follow-through on coordinated, collaborative efforts among key stakeholders, particularly CDOs.

Figure 12 provides a glimpse into a transformed healthcare system.³⁶ For example, to significantly reduce the incidence of a chronic condition (for example, coronary artery disease or diabetes), the healthcare system would need to:

- Help citizens lead healthier lifestyles
- Focus on prediction, prevention and early detection and treatment for those people for which healthy lifestyle alone is insufficient to prevent the onset of the condition
- If care is needed, base the decisions on evidence and shared decision-making, where appropriate.

To help enable the above, CDOs could lead or participate in developing a robust information infrastructure to facilitate rapid learning and incorporation of the information into practice (innovation, safety and quality); providing the patient information needed for better self-management of the condition; patient monitoring and compliance; and care coordination. CDOs should also build a culture that is focused on value, safety, quality and innovation. These changes will require strong leadership and a clear vision.

FIGURE 12.
CDOs should redefine their relationships with citizens and other stakeholders.



As CDOs seek to adapt to their changing environments, some key behaviors and decision-making may be guided by truisms – things we believe to be true. A different

perspective on these truisms may help create an environment more conducive to transforming to a more value-based, sustainable, accountable and affordable healthcare system (see Figure 13).

FIGURE 13.
A different perspective on truisms.

Truisms?	Our perspective
It's someone else's problem. I'll "protect my turf" while they fix it.	All stakeholders need to be more accountable and work together.
More money will fix the problem.	There is little correlation between overall spending and value received.
IT will fix the problem.	The problem cannot be fixed without IT.
The solution to the problem is consistent, high-value care delivery.	Yes, and citizen expectations and behaviors also will have to change.
Everyone should get all the care that he or she wants or needs.	Countries do not have unlimited funding. Tough, informed decisions will have to be made.
Better care means more care.	Better care means the right amount of the right care.
All healthcare is local.	Solutions and much of the care will remain local. Competition will not.
This, too, shall pass.	This time, the world is fundamentally different.

Source: IBM Global Business Services and IBM Institute for Business Value.

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Related publications

Adams, Jim, Edgar L. Mounib, Aditya Pai, Neil Stuart, Randy Thomas and Paige Tomaszewicz. "Healthcare 2015: Win-win or lose-lose?" IBM Institute for Business Value. October 2006. <http://www.ibm.com/healthcare/hc2015>

Adams, Jim, Barbara A. Archbold, Edgar L. Mounib and David New. "Healthcare 2015 and U.S. health plans: New roles, new competencies" IBM Institute for Business Value. September 2007. <http://www.ibm.com/healthcare/hc2015>

Aparajithan, Srivathsan, Shanthi Mathur, Edgar L. Mounib, Farhana Nakhoda, Aditya Pai and Libi Baskaran. "Healthcare in India: Caring for more than a billion." IBM Institute for Business Value. (Forthcoming)

Hew, Chee. "Healthcare in China: Toward greater access, efficiency and quality." IBM Institute for Business Value. March 2006. http://www-03.ibm.com/industries/healthcare/doc/content/bin/Healthcare_in_China.pdf

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References

- ¹ Adams, Jim, Edgar L. Mounib, Aditya Pai, Neil Stuart, Randy Thomas and Paige Tomaszewicz. "Healthcare 2015: Win-win or lose-lose?" IBM Institute for Business Value. October 2006. <http://www.ibm.com/health-care/hc2015>
- ² Organisation for Economic Co-operation and Development. 2005. OECD health data 2005: Statistics and indicators for 30 countries (2005 edition). Paris: OECD Publishing.
- ³ Note: We use "citizen" as a general term throughout the report to connote the populace in a country. The term is not meant to infer anything else such as entitlement to certain rights.
- ⁴ Aparajithan, Srivathsan, Shanthi Mathur, Edgar L. Mounib, Farhana Nakhoda, Aditya Pai and Libi Baskaran. "Healthcare in India: Caring for more than a billion." IBM Institute for Business Value. (Forthcoming)
- ⁵ Thomas Eric J., David M. Studdert, Helen R. Burstin, et al. "Incidence and types of adverse events and negligent care in Utah and Colorado." *Med Care* 2000;38:261-71.
- ⁶ Andrews L. B., C. Stocking, T. Krizek, et al. "An alternative strategy for studying adverse events in medical care." *Lancet* 1997;349:309-13.
- ⁷ Marang-van de Mheen, Perla J., Evert-Jan F. Hollander and Job Kievit. "Effects of study methodology on adverse outcome occurrence and mortality." *International Journal for Quality in Health Care*. 2007 Dec;19(6):399-406.
- ⁸ Brennan T. A., L. L. Leape, N. M. Laird NM et al. "Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study." *New England Journal of Medicine*. 1991;324:370-6.
- ⁹ Andrews L. B., C. Stocking, T. Krizek, et al. "An alternative strategy for studying adverse events in medical care." *Lancet* 1997;349:309-13.
- ¹⁰ Department of Health Expert Group. "An organisation with a memory: report of an expert group on learning from adverse events in NHS." Chairman: Chief Medical Officer London: The Stationery Office, 2000.
- ¹¹ "Income, poverty, and health insurance coverage in the United States: 2006." U.S. Census Bureau. August 2007. Available at <http://www.census.gov/prod/2007pubs/p60-233.pdf>
- ¹² Adams, Jim, Edgar L. Mounib, Aditya Pai, Neil Stuart, Randy Thomas and Paige Tomaszewicz. "Healthcare 2015: Win-win or lose-lose?" IBM Institute for Business Value. October 2006. <http://www.ibm.com/health-care/hc2015>.
- ¹³ Adams, Jim, Barbara A. Archbold, Edgar L. Mounib and David New. "Healthcare 2015 and U.S. health plans: New roles, new competencies" IBM Institute for Business Value. September 2007. <http://www.ibm.com/healthcare/hc2015>
- ¹⁴ World Health Organization. 2005. "Preventing chronic disease: a vital investment." Geneva: World Health Organization.
- ¹⁵ Lohr KN, ed. *Medicare: A Strategy for Quality Assurance*. Washington, DC: National Academy Press; 1990.

- ¹⁶ Moses Hamilton III, Dorsey E. Ray, Matheson David H.M., Thier Samuel O. "Financial anatomy of biomedical research." *Journal of the American Medical Association (JAMA)*. 2005, 294(11):1333-1342.
- ¹⁷ Commission of the European Communities. "Health Strategy Staff Working Document" to accompany white paper, "Together for Health: A Strategic Approach for the EU 2008-2013." October 23, 2007. http://ec.europa.eu/health/ph_overview/Documents/strategy_working_document_en.pdf
- ¹⁸ Stampfer, Meir J., Frank B. Hu, JoAnn E. Manson, et al. "Primary prevention of coronary heart disease in women through diet and lifestyle." *New England Journal of Medicine*. 2000. 343(1): 16-22.
- ¹⁹ Hu, Frank B., JoAnn E. Manson, Meir J. Stampfer, et al. 2001. Diet, lifestyle, and the risk of type 2 diabetes mellitus in women. *New England Journal of Medicine* 345(11): 790-97.
- ²⁰ Harvard Center for Cancer Prevention. 1996. Harvard report on cancer prevention - volume 1: causes of human cancer. *Cancer Causes Control* 7(Suppl. 1): S3-S59; Trichopoulos, Dimitrios, Frederick P. Li, David J. Hunter. 1996. "What causes cancer?" *Scientific American* 275: 80-87; Willett, Walter C., Graham A. Colditz, Nancy E. Mueller. 1996. "Strategies for minimizing cancer risk." *Scientific American* 275: 88-91, 94-95; Harvard Center for Cancer Prevention. 1997. Harvard report on cancer prevention - volume 1: prevention of human cancer. *Cancer Causes Control* 8 (Suppl. 1): S5-S45.
- ²¹ Himmelstein, David U., Elizabeth Warren, Deborah Thorne and Steffie Woolhandler. "Illness and Injury as Contributors to Bankruptcy." *Health Affairs Web Exclusive*, W5-63. February 2, 2005.
- ²² Peters, David H., Abdo S. Yazbeck, Rashmi R. Sharma, et al. "Better health systems for India's poor: Findings, analysis and options." World Bank. 2002.
- ²³ "Prijsexplosie bij Argenta geen uitzondering." *De Standaard*. April 2, 2008. <http://www.standaard.be/Artikel/Detail.aspx?artikelId=8S1Q271V>
- ²⁴ "Brazilian Health Care System in 2025: The Challenge and Need of Conscious and Responsible Decisions." *Medical News Today*. May 3, 2006. <http://www.medicalnewstoday.com/medicalnewsphp?newsid=42657>
- ²⁵ IOM Committee on Health Literacy. "Health literacy: a prescription to end confusion." Washington, DC: National Academies of Science, 2004; Berkman, Nancy D., Darren A. DeWalt, Michael P. Pignone, et al. "Literacy and health outcomes." Evidence Report/Technology Assessment No. 87: 1-8, 2004; Human Resources Development Canada (1997) National Literacy Secretariat, and the Organisation for Economic Cooperation and Development. "Literacy Skills for the Knowledge Society." Second Report of the International Adult Literacy Survey. Ottawa: 1997; Sihota, Saranjit and Linda Lennard. National Consumer Council (2004). "Health Literacy: Being able to make the most of health." London: 2004. Available on www.ncc.org.uk

- ²⁶ Prochaska, James O., John C. Norcross and Carlo C. DiClemente. *Changing for good*. New York: Morrow. 2004.
- ²⁷ Eisenberg, David M., Roger B. Davis, Susan L. Ettner, et al. 1998. "Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey." *Journal of the American Medical Association (JAMA)* 280: 1569-75.
- ²⁸ MacLennan, Alastair H., Stephen P. Myers, Anne W. Taylor. 2006. "The continuing use of complementary and alternative medicine in South Australia: costs and beliefs in 2004." *Medical Journal of Australia* 184(1): 27-31.
- ²⁹ Tsukioka, Aki. "Yano Research Institute surveys integrative medicine market in Japan." 2006. <http://www.medicalnewstoday.com/medicalnews.php?newsid=35892>
- ³⁰ IBM Institute for Business Value analysis.
- ³¹ Ibid.
- ³² WHO (2006). "The world health report 2006 – Working together for health." Geneva, World Health Organization.
- ³³ Walton, Mary. *Deming Management at Work*. New York: Putnam. 1990.
- ³⁴ Rubin, Rita. "In Medicine, Evidence Can Be Confusing." *USA Today*. October 16, 2006.
- ³⁵ Interview of Glenn Steele Jr., MD, PhD, President and Chief Executive Officer, Geisinger Health System.
- ³⁶ For more information on our perspective on three transformation themes in a "win-win" transformation, please refer to Adams, Jim, Edgar L. Mounib, Aditya Pai, Neil Stuart, Randy Thomas and Paige Tomaszewicz. "Healthcare 2015: Win-win or lose-lose?" IBM Institute for Business Value. October 2006. <http://www.ibm.com/healthcare/hc2015>



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