PRICEWATERHOUSECOOPERS

HEALTHCAST 2010℠

Smaller World, Bigger Expectations

November, 1999

HealthCast 2010: Smaller World, Bigger Expectations is a view of the future from the healthcare practice of PricewaterhouseCoopers. To compile this report, PricewaterhouseCoopers conducted extensive desk research and commissioned a wide-ranging survey of more than 380 thought leaders. The HealthCast 2010 survey, referenced in this report, was conducted in the United States, the United Kingdom, Scandinavia, Italy, Spain, the Netherlands, Germany, New Zealand, Canada, and Australia. Those surveyed included a mix of government officials, policy makers, and top executives of hospital systems, employers, physician groups, other providers, insurers, and medical supply manufacturers. In addition, more than 50 thought leaders from Canada, New Zealand, Spain, the Netherlands, Switzerland, the United Kingdom and the United States were interviewed at length about future trends and implications in the decade ahead. We are very grateful to all those who shared their views with us. The views expressed in this report do not constitute regulatory or legal advice. Contact professional counsel to address your specific regulatory needs.

HealthCast 2010 is the first in a series of reports on the future of the healthcare industry. For information on the future of the pharmaceutical industry, PricewaterhouseCoopers has published a similar series called ***Pharma 2005***.

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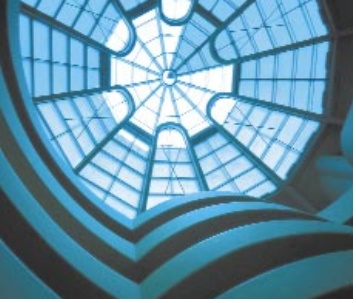


Executive Summary

At PricewaterhouseCoopers, we are advisers and consultants to the largest service business on the globe – healthcare. That's why we've invested in a far-reaching research effort to look at this important industry's future on both sides of the Atlantic and in the Pacific Rim. The result is this report, **HealthCast 2010: Smaller World, Bigger Expectations.** It's a comprehensive examination of the road ahead for the global healthcare industry in the next decade.

Each nation considers itself special, and so it is with each nation's healthcare system. Healthcare in the United States, New Zealand, or the Netherlands carries its own set of traditions, culture, payment mechanisms, and patient expectations.

Gaze ahead through a different lens. Healthcare will no longer be shaped by the differences of our past but by the commonalties of our future.

As we discuss in the coming pages, providers and purchasers will face similar challenges in the 2010 healthcare economy. Thanks to the Internet, telecommunications and a proactive consumer, the healthcare world is smaller. Consumers shop for healthcare information on web pages from their homes. Their appetite for healthcare service and health information is insatiable. They want more. Rather than a hindsight view – (here's what has made you ill) – screening technology and genomics will allow medicine to look forward (here's what your risks are for these illnesses).

Forecasting the future of the global healthcare industry is risky business. That's why we describe not one path forward, but many. Beware! Some paths can be foreseen and others cannot. In several sections of HealthCast 2010, we make reference to **"Forks in the Road."** We think the industry is moving this way or that…but new opportunities, disasters or government intervention may carve out a new path. Such "forks" could redirect the speed or path of change.

During the past decade, European government reforms have placed both health providers and social insurers in a new competitive world of contracts and limited budgets. Yet, some have failed to recognize the new challenges they face. In the same way, United States providers received a taste of this when employers moved virtually their entire workforces into managed care, a major change of direction that occurred without the approval or consent of healthcare providers and without major government legislation. Most adapted; some did not.

To research the future, we talked to more than 50 thought leaders throughout the globe. We also initiated the HealthCast 2010 survey which polled 380 top healthcare executives. Results from the survey are integrated throughout this report.

To look toward the future, we've identified what we see as Three Forces of Change and the Four Future Trends that result from those forces. Readers may notice that the three forces that we identify do not include three that often characterize futuristic healthcare reports. Obviously, aging, medical technology and drug development will have a major impact on the 2010 healthcare system. However, we have chosen to focus instead on consumerism, e-health and genomics as new, powerful forces that will work together to accelerate dynamic change in the industry.

These are the forces that will be most threatening to healthcare providers, insurers, governments, and professionals in the form of innovation, new competitors and new opportunities.

Three Forces of Change

1. An Empowered Consumerate Creates Impatient Patients.
2. E-Heath Adaptability Equals Survival.
3. Genomics Shifts Healthcare from Cure to Prevention.

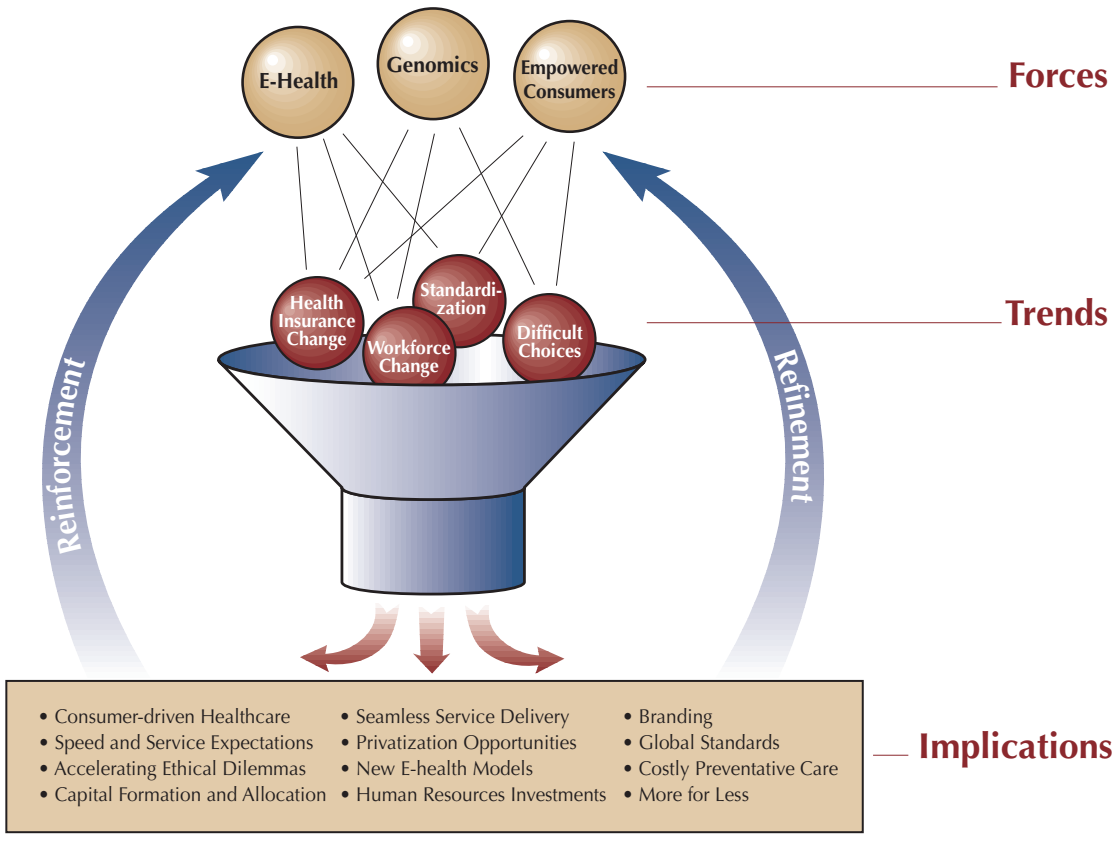
Four Future Trends

1. Health Insurance Trends are Converging in the United States, Canada and Europe.
2. Health Processes Are Becoming Standardized.
3. Workforces Must Adapt to Technology and Consumerism.
4. Aging, Technology and Consumerism Create Difficult Choices.

Twelve Implications

The implications of these forces are powerful. We've summed them up as follows:

1. Healthcare organizations that are consumer friendly will be winners.
2. Organizations must distinguish themselves through brands.
3. Service and speed will be keys to consumer satisfaction.
4. New e-business models will emerge and challenge traditional medicine.
5. The race for capital will hinge on the ability to demonstrate quality, efficiency and customer focus.
6. Resources must be reallocated to retrain the workforce.
7. Functional silos in healthcare must be eliminated and replaced with seamless service.
8. Payers must stress prevention because early detection and intervention will cost more.
9. Consumers will want more and won't want to pay for it.
10. Ethical dilemmas will accelerate for consumers, providers and purchasers.
11. New opportunities for private health insurers outside the United States will expand rapidly.
12. Medical professionals need to work toward global standards of medical treatment.



"You Are Here."

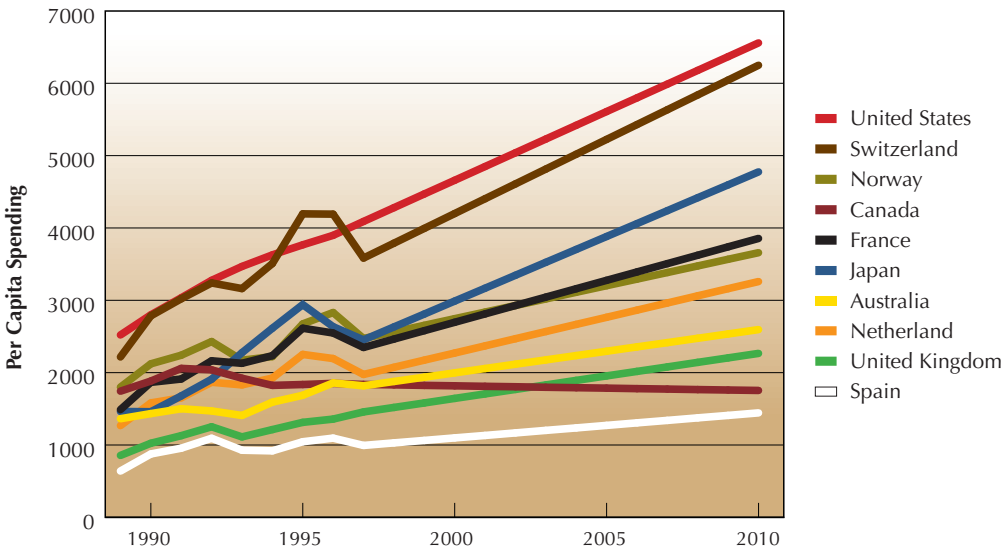
It always helps to know from where you're starting. So, we'll set out some facts and assumptions.

Healthcare is a growing industry

Between 1960 and 1997, the percentage of Gross Domestic Product spent on healthcare by 29 members of the Organization for Economic Cooperation and Development (OECD) nearly doubled from 3.9% to 7.6%. The United States spends the most – 13.6% in 1997. That percentage is projected to increase to more than 16% by 2010, according to the United States government. Of eight industrialized nations studied recently by the Commonwealth Fund, the United Kingdom spends the least at 6.7%.

Healthcare spending is on an upward track partly because as nations become wealthier, consumers demand they spend more on healthcare (about ½% increase in healthcare cost for each percent increase in wealth)[1]. Technology and automation have the potential to lower costs. However, those downward pressures are more than offset by the impact of an aging society, consumerism, biotechnology and medical breakthroughs resulting in an overall increase in cost at a rate of between 2½% and 3½% per year.[2]

Total Expenditures on Health Per Capita ($ Exchange Rate)



Source: OECD Health Data 98

As the world grows richer, it will want the best healthcare it can buy.

So, how much healthcare is the right amount? That's for society to decide, but remember that every franc or pound spent on healthcare means one less spent on some other consumable item. When healthcare inflation tempered in the mid- to late 1990s in the United States, some

argued that it indirectly buoyed the economic boom the nation now enjoys. As health spending held steady, Americans had more money to spend on computers, vacations and other personal items. Similarly, when European countries needed to hold back public spending to meet the Maastricht Treaty criteria, many looked towards healthcare to reduce expenditures.[3]

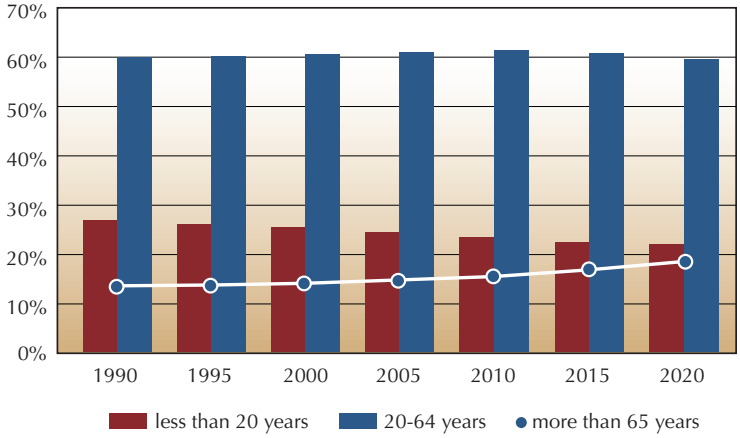
So while health expenditures increase with growth, reducing these expenditures may be a key to economic growth and a source of economic advantage.

The world is graying.

Though not in crisis yet, many nations will be looking down the barrel of an exploding cannon. In 1999, working taxpayers outnumber non-working pensioners in the developed world (North America, Japan, Europe, Australia and New Zealand) by 3 to 1. However, by 2030, the ratio will fall to 1.5 to 1. Will this set up generational conflict about the financial resources needed to keep the elderly healthy? In some countries, it will be 1 to 1 or lower, putting a tremendous strain on the pension and healthcare budgets of those nations.[4] If all sectors of the health system – payers, providers and patients – focus on prevention and provide incentives for patient accountability, can they avert the financial undertow of the elderly's medical needs?

The United States will just see the crest of this wave by 2010 when only one-fourth of the annual increase in the ratio of national health expenditures to gross domestic product will be due to aging. The bigger impact comes between 2010 and 2040.

65+ As Percentage of Total Population in Developed Countries



Source: World Population Prospects (1999 revision), United Nations, Dept. of Economics and Social Development, New York, 1999

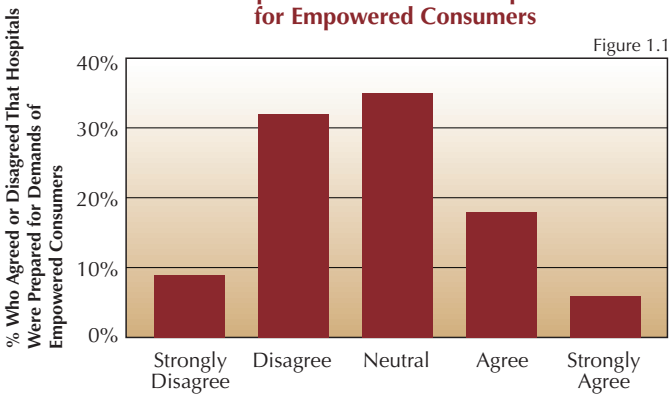
Force #1

An Empowered Consumerate Creates Impatient Patients

Healthcare systems have traditionally been confused about who their customers are, and rightly so. Is it the doctor? Is it the patient? Is it the health insurer or government purchaser?

Hospitals Viewed as Not Prepared for Empowered Consumers

Figure 1.1



Source: HealthCast 2010, PricewaterhouseCoopers

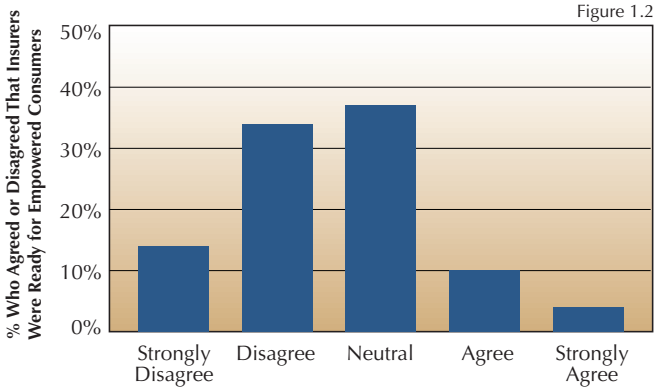
While the doctors and purchasers have received most of the attention from healthcare systems in the past, we believe that situation is shifting. Consumers are starting to spend an increasing percentage of their own personal income on health, and they're making more decisions about their own treatments.

Consumers will be the key customer group of the 21st century in healthcare. Beware providers and health insurers. Tomorrow's consumers may be adversarial, fickle and decidedly impatient.

Yet, hospitals and insurers are generally not prepared for the demands of tomorrow's consumers, according to the PricewaterhouseCoopers HealthCast 2010 survey. Only 25% of those surveyed agreed or strongly agreed that hospitals were prepared. (See figures 1.1 and 1.2.) In addition, hospital executives in the survey thought that they were more prepared than others thought they were.

Insurers Viewed as Not Prepared for Empowered Consumers

Figure 1.2



Source: HealthCast 2010, PricewaterhouseCoopers

The post-war baby boomers who have been an egocentric and demanding group at each stage of their lives are now becoming the key healthcare consumers, purchasing care for their own aging bodies, as well as for their frail parents. **Other forces that contributed to the Impatient Patient:**

- Individuals are better educated about everything, including healthcare.
- Searchable health information became available quickly and easily through the Internet.
- Reduced restrictions on direct-to-consumer advertising opened a floodgate of ads by pharmaceutical companies in some countries.
- Non-healthcare commercial transactions became cleaner and quicker, prompting consumers to become more impatient with the inefficiency of healthcare.
- Patients believed no one was on their side – they became engaged in their healthcare decision-making because they felt abandoned by the system.
- Physicians were spending less and less time with patients.
- Managed care restrictions in the United States and similar attempts to define entitlements in European and other healthcare systems frustrated consumers.
- Waiting lists grew longer in Canada and some European countries.

Healthcare's Traditional Purchasers Will Begin Shifting More Costs to Individual Citizens

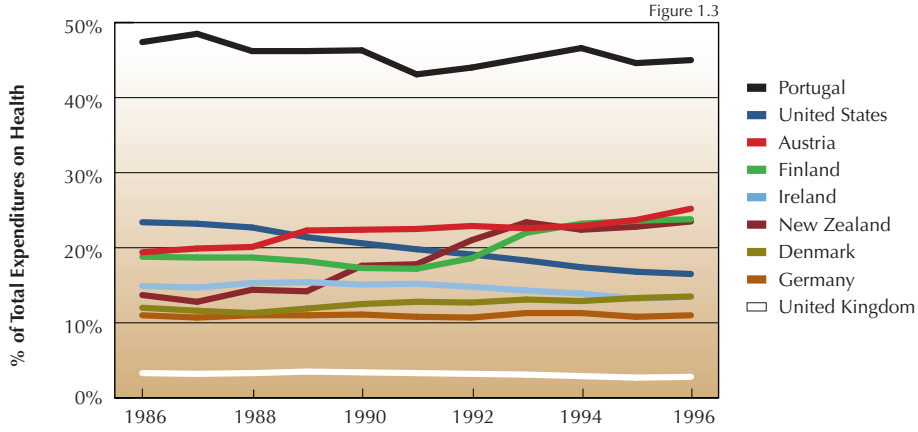
There's one irony. In the United States, at least, consumers have actually been letting others foot an increasingly larger share of the cost. Yet, that's starting to change.

In the United States, the percentage of healthcare costs paid by consumers has dropped drastically over the past 20 years. Consumers' percent of out-of-pocket costs, which include health insurance premiums, co-pays and deductibles, has dropped from 34% in 1970 to 17% in 1999.

Yet, over the next 10 years, we believe that trend will level off and could begin to rise slightly as employers shift more of the cost of care to workers. Some other countries are already seeing this increase in out-of-pocket spending. (See figure 1.3.)

Out-of-Pocket Outlays

Figure 1.3



Source: OECD Health Data 98

As consumers in developed countries dig deeper into their pockets to fund their healthcare needs, they will become even more demanding consumers who are sensitive to value and hungrier for information.

This trend also resounds in nations with universal health coverage where government is pushing more of the cost onto its citizens through higher statutory payments or higher direct contributions. In some countries, minor treatments or procedures are being de-listed from reimbursement, which will throw those products or services into the realm of commodity pricing in a free market.

All health providers will acknowledge the new consumerism and include that component in their marketing strategies. "The design of facilities must change to better accommodate patients," notes Douglas Peters, CEO of Jefferson Health System in Philadelphia. "We must move beyond these monolithic structures that are suited to staff but are not user-friendly." To do so, hospitals will need to balance efficiency, access and relationships with physicians.

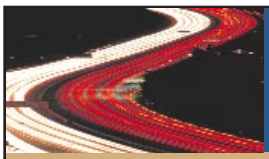
In addition, some healthcare organizations and insurers will consider the incentive systems of retailing and other market-driven enterprises to meet the demands of the patient-consumer. Patient satisfaction will be more important and quantifiable through consistent survey techniques. "We periodically measure patient satisfaction and compare the results against standards to improve performance," notes Geert H. Blijham, M.D., professor of internal medicine, president and CEO of the University Medical Center in Utrecht, the Netherlands. "We know the major drivers for patient satisfaction are the patient encounter, scheduling, transparency of the care process and the hospital facilities."

Major surveys of patient satisfaction are now under way in the United Kingdom, Sweden, the Netherlands and Switzerland. Many healthcare providers will enlist patients as vested partners, conducting focus groups and organizing community boards that infuse them with new ideas.

In 1998, the International Alliance of Patient Organizations was formed, bringing together 40 patient groups from across the world including Denmark, France, Germany, the Netherlands, the United Kingdom, and United States. This group has formed the first global patient consumer forum promoting the voice of the patient at all levels in health. "This could be the point at which health consumer organizations finally create a structure that can face up to the interests of the health and pharmaceutical industries at national and international levels," notes Marianne Rigge, CEO of the College of Health, London.

Consumers Will Want "My Healthcare, My Way"

One size will fit no one in the 2010 healthcare marketplace. Customization of care will grow in importance as consumers choose their own care paths. Since behavioral health has a big impact on disease, putting consumers into the equation could be a big benefit and lower costs. Yet, the 21st century consumers will no longer trust their physician to make all the decisions for them.



Forks in the Road

- A recession hits and disposable income plummets.
- The United States adopts a single-payer system.
- Health spending accelerates at a much higher rate of inflation than other goods, prompting government to introduce price controls.
- Consumerism forces commodity pricing on healthcare services and procedures.

"Canadian data shows that 10% to 15% of all patient encounters with primary care physicians involve patients who have already consulted sources on the Internet," says Dr. Michael Guerriere, chief operating officer of the Toronto Hospital. "Patients will finally realize that it is impossible for their physician to know everything."

The Chinese call it "losing the mandate of heaven." Care givers, particularly physicians, once wore the halo of angels. They were God's presence on earth and each patient recognized that his or her future rested in their hands. In recent years, the halo has slipped. No self-respecting obstetrician gets by with patting the knee of a pregnant mother and saying, "Don't worry, honey. I'll take care of everything." The pregnant mother most likely has downloaded report cards on hospitals in her area, interviewed pediatricians, and researched the pros and cons of various anesthetics used during Caesarian sections.

Still, how much of healthcare can consumers understand and could they really make intelligent purchases? "Healthcare literacy is going up and at the same time we're working to bring the sophistication of quality information down to a level at which most people can take advantage of it. But it's still early to expect a wide range of consumers who are highly informed and sophisticated about healthcare," says Margaret E. O'Kane, president of the National Committee for Quality Assurance (NCQA) in the United States. Will a little knowledge be a dangerous thing for consumers? Healthcare organizations will be challenged to bridge the gap to help consumers make complex health decisions.

Organizations like the NCQA are working at making provider report cards that are relevant to consumers. Not only are report cards becoming more detailed and relevant, but provider organizations that previously turned their back on the grading process are trying to incorporate their ideas rather than stand in the way of this runaway train.

In addition, a common vision of some healthcare futurists is that consumers won't have to decipher the healthcare world alone. They'll hire intermediaries to handle their healthcare needs. Whether these intermediaries will be brokers, agents or nurses remains to be seen. Consumers may pay for them, or in some cases, employers may do so. This will especially have a major impact on general practitioners, who currently see themselves in this role. Also, such intermediaries may merely be virtual health agents or software programs, similar to intelligent search agents that sort through health information according to a particular profile. Some consumers may rely on both human and virtual health agents.

In the United Kingdom, the National Health Service has created a call center of nurse advisors. NHS Direct is a national telephone triage and advice service system that covers 20 million citizens; it will reach the entire population by September 2000. NHS also has proposed the appointment of a patient advocate at every United Kingdom hospital.

Consumerism Creates Contradictions

As we said before, consumerism could save money. Many diseases can be reversed or treated far less expensively than they are today. Heart disease, osteoporosis, diabetes – all are diseases in which the costs drop drastically when the patient takes an active role in managing the illness. Consider that depression and alcohol use are two of the top causes of disease now and beyond 2010. (See figure 1.4.) "As countries get richer, alcohol becomes more of a determinant of disease," notes Richard Wittenberg, president and CEO of the American Association for World Health.

Leading Causes of Death in Developed Countries

Figure 1.4

Causes of Death	1990 % of all deaths	2020 % of all deaths
1. Ischemic heart disease	11.60%	11.50%
2. Unipolar major depression	6.60%	5.50%
3. Cerebrovascular disease	6.30%	6.50%
4. Trachea, bronchus and lung cancers	4.90%	4.00%
5. Road traffic accidents	4.50%	3.90%
6. Alcohol use	4.00%	3.40%
7. Osteoarthritis	3.70%	3.10%
8. Dementia and other degenerative and hereditary CNS disorders	3.60%	3.00%
9. Chronic obstructive pulmonary disease	2.70%	2.90%
10. Self-inflicted injuries	2.60%	2.20%

Source: Global Burden of Disease

Yet, in practice, consumers have not been responsible stewards of their own health. Obesity, smoking and alcohol are three primary causes of disability and death in many industrialized countries. Ten years ago, one-fourth of Americans were overweight. Now, it's half, and one-half of those are considered obese.[5] Clearly, Americans are better-educated, but they're also fatter.

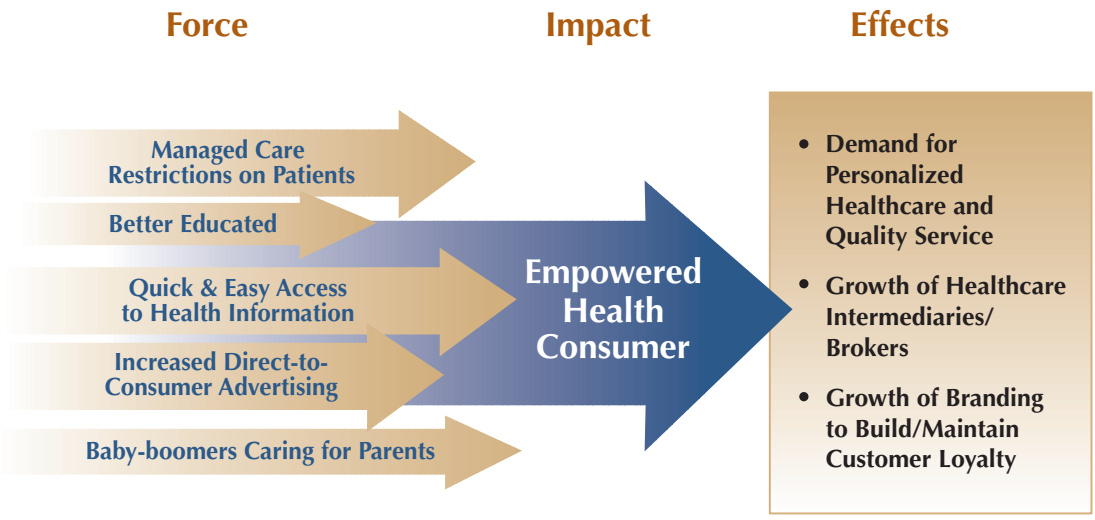
Combine these rising health costs with the boom in anti-aging pharmaceuticals, nutraceuticals and cosmetics that have biometric formulations. The verdict is in. Healthcare costs will continue to trend upward.

With anti-aging treatments on the leading edge, consumers are more likely to see a blurring of the lines of wellness, prevention, acute care and chronic care. Already they're spending more on alternative treatments such as herbal medicine, relaxation techniques, massage, acupuncture, spiritual healing, vitamins and chiropractic services. In 1997, United States spending on alternative care was estimated at $21.2 billion.[6] If that category of health spending increases at an annual rate of 15%, it could reach $130 billion by 2010.

Even the staid curriculums of medical schools are opening the door wider. Thirty-four of the country's 125 medical schools – including Harvard, Yale and Johns Hopkins – offer courses in alternative medicine.[7] Some hospitals already have integrated their traditional caregivers with alternative ones.

Consumerism Breeds Branding

Healthcare providers and vendors will spend more on strategic marketing and in particular on branding. As healthcare consumers become more brand savvy, they will become more brand dependent, according to David A. Shore, Harvard's branding expert and the associate dean of the Harvard School of Public Health. "It used to be that the physician was the brand and thus consumer's dependency was to the physician. If a physician moved across town, the patient still went to him or her," he says. "However, in an era of managed care, the likelihood that a patient will see the same physician when they return next year for their annual physical is low. Thus, it behooves healthcare organizations to brand at the parent or institutional level, rather than at the sub-brand or clinician level. Consider the parallel in the airline industry. The brand equity is with the airline carrier, not the individual pilot."



In the United States, studies have shown that the influx of direct-to-consumer advertising (up 23% to $1.32 billion in 1998 compared to 1997, according to IMS HEALTH[8]) spurs consumers to ask for certain brand-name drugs from their doctors. In Europe, such advertising is prohibited, but consumers are finding their way to pharmaceutical promotions through drug makers' Internet sites. Some are questioning how long the advertising prohibition can hold when consumers have access to drug advertising through other means, and others argue that healthcare advertising is beneficial in providing information. Direct-to-consumer advertising in pharmaceuticals may be just the first wave of an onslaught of branding and multimedia advertising of healthcare products and services. Between 1980 and 1999, pharmaceutical spending saw the biggest increase in United States health spending, a surge that may be encouraged by direct-to-consumer ads.

When Ethicon Endo-Surgery, a United States company, found that most women were not being told about its new product, Mammotome Breast Biopsy System, a minimally invasive diagnostic technology, the company went to a direct-to-consumer advertising campaign. The spring 1999 campaign produced 35,000 inquiries and each inquirer was mailed an information kit about the Mammotome system.[9]

With success like that, other cutting-edge medical device makers may see direct-to-consumer advertising as an area with a high return on investment.

Yet, advertising and the money to brand could shift the balance of power even more to well-capitalized pharmaceutical companies. If so, will they sidestep into other areas of care through disease management, becoming the virtual door through which patients walk to receive disease treatment?

"Providers may have a more adversarial relationship with pharmaceutical firms in the future," says Jefferson's Peters. "They need hospitals and related physicians to do clinical trials, but the relationship may become more competitive."

Force #2

E-Business Adaptability Equates Survival in the New Healthcare World

The cost of telecommunications and computing power has dropped so dramatically that the potential finally exists to unite healthcare providers with patients and purchasers in a virtual seamless system. Tele-everything through television sets and other terminals will change the way patients are treated, operated on, monitored and counseled. If patients could communicate with physicians or be monitored through the Internet, more than 20% of in-office visits could be eliminated, according to respondents in the HealthCast 2010 survey. In addition, respondents said they generally felt that more than 30% of physicians' time will be spent using web-based tools by 2010.

Instead of traveling to a physician's office and waiting, a patient in the future may be able to communicate with a physician or nurse at home through telemedicine links. On-line eligibility and verification will be checked instantaneously when a patient calls in to request a session with the physician or at a less expensive rate, a physician assistant. Some healthcare plans may give patients with chronic conditions cheap computers, encouraging them to engage in two-way monitoring and education. Providers will have new opportunities to deliver personalized care by integrating customer data across interactive channels. (See figure 2.1.)

Mr. J. Consumer in 2010

Meet Mr. J. Consumer. His experiences and demands are characteristic of the new consumers in the United States, Canada, Europe and the Pacific Rim in 2010. His generation is the most prosperous and best educated to walk on the earth. He is the consummate consumer, buying products in an open global marketplace.

Mr. J. lives in a wireless, interconnected e-world. He has the Web in his pocket. Traveling in his car, equipped with a Web-enabled directional system, Mr. J. shops, transacts business, sends messages and receives news updates through his palm-sized personal communicator, a fifth-generation mobile phone that combines voice, data and images. Push technology on his communicator reminds him when to monitor his vital signs and make tele-appointments with his healthcare providers.

Mr. J. dwells in what might be referred to as an e-go bubble. Everything is customized to his wants and needs, e-healthcare included. He knows and understands the medical treatments he is receiving. Many of his e-posodic care is delivered through Web-based tools and telemedicine consults. He maintains his own e-patient record on an Internet portal service and updates it with his own personal comments that are synthesized through speech recognition technology. He gives e-practitioners access to update the file through a security code.

Mr. J.'s mother often gets blood clots. Through an online older women's organization, she shares experiences with about 1,000 other patients all over the world. Together, they're chipping in to fund and participate in clinical trials for a new gene-based therapy. Through the Internet, they're taking bids from various research organizations, biotech companies and drug makers throughout the world.

Cheap computers and telecommunications have e-qualized access to the Internet so that all classes of citizens, rich or poor, can log on for e-healthcare in libraries, community centers, schools and malls.

It's an e-, e-, e-world...

Healthcare has been slow to achieve the cost savings potential of information technology. Will it be penalized while other non-healthcare businesses try to usurp its turf? Or, will the complexities and ethical considerations inherent in the industry necessitate partnerships between seasoned providers and E-business interlopers?

Hospitals and insurers have a significant amount of opportunity to leverage the benefits of E-business, according to the HealthCast 2010 survey. (See figure 2.2.)

Patient Data That Flows Through Interactive Channels Customizes the Patient Experiences

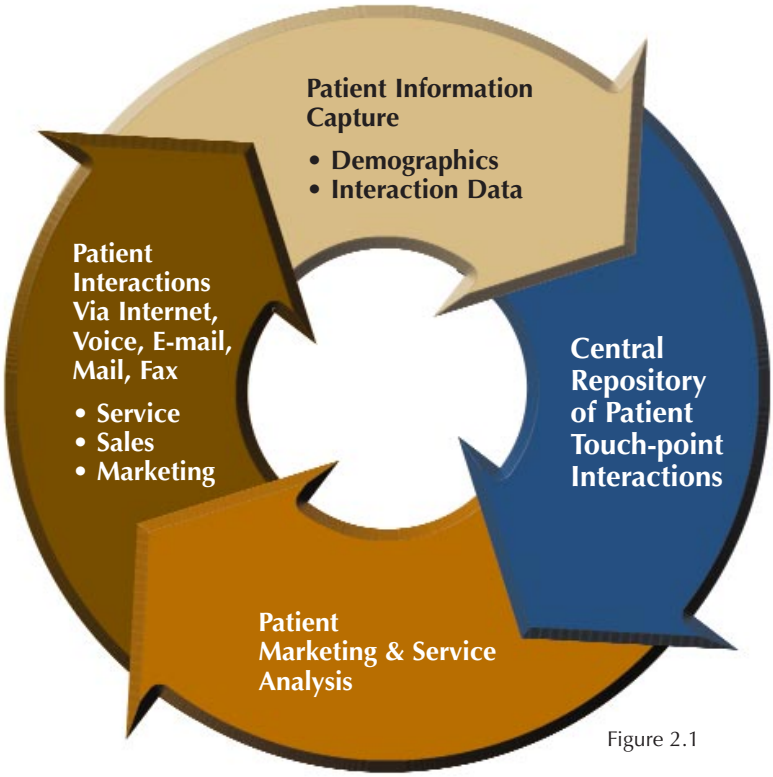


Figure 2.1

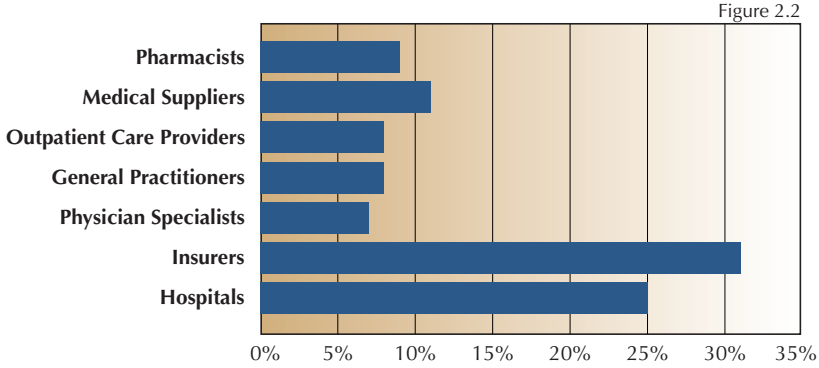
E-business Is Business

Think about the traditional business world as a comet streaking through the sky. Week by week, pieces of the comet are breaking off. They're no longer part of the traditional business world. They're dot-com companies. In the future, dot-com will be an integral part of all healthcare business strategies. Business-to-business I-commerce is expected to explode from $43 billion in 1998 to $1.3 trillion by 2003, according to Forrester Research, Cambridge, Massachusetts. Nearly 10% of all business will be transacted over the Web, according to that prediction. Forrester believes pharmaceutical and medical product transactions will flourish to $44 billion in 2003, up from less than $1 billion in 1998.

The Internet will erase one of the biggest handicaps of the healthcare industry – relay speed. It will slash the time it takes to make referrals, get test results, get paid, find

Hospitals and Insurers Viewed as Having Most Opportunity in E-Health

Figure 2.2



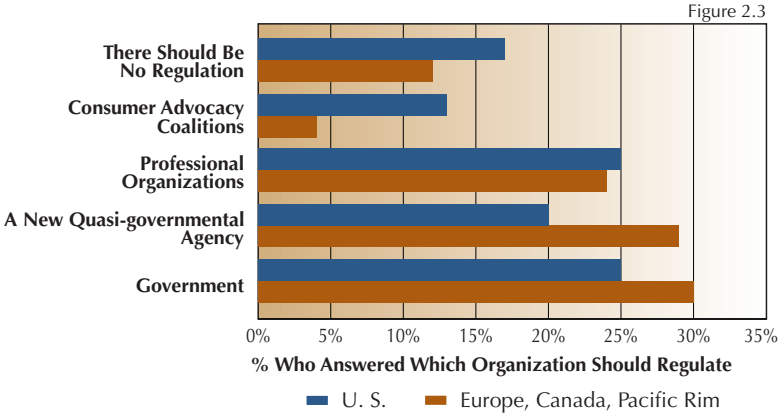
% of Respondents Who Said Segment Had Most Opportunity to Leverage E-Business' Benefits

Source: HealthCast 2010, PricewaterhouseCoopers

patients for clinical trials, disseminate best practices, share cost information, on and on. It will quicken the pace for the adoption of new ideas, new therapies and new measurements. Already, the custom of waiting for monthly medical journals to disseminate new discoveries is being challenged by Internet publishing companies. Rather than waiting for medical staff meetings, health professionals are educated through the Web and communicate in realtime with peers about diagnosis, treatment and best practices. Searchable databases in evidence-based medicine enable healthcare providers and buyers to read about the outcomes of studies on protocols, formulas, standards and health economics.

Agencies Favored to Regulate Online Sale of Healthcare Goods and Services

Figure 2.3



Source: HealthCast 2010, PricewaterhouseCoopers

The rate at which healthcare organizations are developing Web-based solutions is neck-snapping in the United States. In Europe, the adoption of Internet solutions has been somewhat slower, but is accelerating. In fact, government is just beginning to grapple with the regulation of Internet transactions. How deep their role will be is the subject of much debate. According to the HealthCast 2010 survey, either government or a quasi-government agency is favored to regulate healthcare goods and services sold online. (See figure 2.3.) However, it's worth noting that Europeans and United States policy makers felt most strongly about this.

Healthcare has spent hundreds of millions of dollars on disparate systems that can't communicate with each other. The Internet changes everything. Proprietary solutions become impractical, rigid, and outdated as everyone flocks to Web-enabled applications that use Internet protocols to allow information to be exchanged among physicians' offices, HMOs, hospitals, labs, pharmacies and health plans. Browser technology eliminates the problems of interconnectivity and advanced security systems safeguard confidentiality.

E-business can improve business performance through connectivity. However, some healthcare systems may buckle under the financial demands of building an Internet capacity that includes tying in clinical results, prescription and supply ordering, and payer transactions. They may have to focus their investment on one or two targeted efforts first. For example, few healthcare organizations will have the capital to launch a healthcare portal. Portals such as Yahoo! and America Online serve as the front door to Internet surfers. They are extremely expensive to build and maintain, and most healthcare Internet enterprises are choosing to partner rather than build. However, this could change drastically by 2010. Just as cable television has multiplied the number of channels on television, so could dozens of healthcare organizations serve as portals to distinct patient populations in the next decade.

The primary E-business channels for healthcare are transactions, information and interaction:

Transactions

Within the next five years, most healthcare organizations will communicate with suppliers, other providers, payers, regulators and patients through the Internet. New Web-based languages will allow integration and transmission of information and data less expensively than ever.

The Web has the potential to make the industry much more accountable. Clinical accountability has always been a bit vague in healthcare, but through Web-based tools, an electronic trail is built that measures, dissects and ascribes accountability all along the way.

"Ninety percent of healthcare today has no real outcome measures. There is tremendous duplication, waste and absence of quality," notes Wilbert J. Keon, M.D., founding director general of the University of Ottawa Heart Institute. The Web is a conduit for accountability that can track duplication, measure costs and compare outcomes.

In the consumerism section, the likelihood of health agents was discussed. In terms of transactions, the Internet is already cluttered with transaction intermediaries. Examples are E-Trade in the brokerage field, Lending Tree in the consumer loan marketplace, CD Now for music. All of these put consumers closer to the transaction. The basics of the transaction – cost, speed, value – are laid bare. How will healthcare organizations compete on those basics? The Internet has drastically recalibrated consumers' expectations about speed, and healthcare organizations must live up to those new expectations.

E-business could lead to the development of new payment mechanisms. Providers may be able to engage in outcome auditing that focuses on healthy, satisfied patients in the determination of pricing. Reimbursement structures have paid the same for a heart bypass, regardless of whether the surgeon was a neophyte or an established world-class expert. New reimbursement systems may be structured to reward performance.

Healthcare providers must retool their organizations based on the faster, less expensive framework of the Internet. They need to consider the overhead that can be eliminated because of the Web. What real estate, labor, processing and marketing costs can be downsized or even eliminated?

Information from Providers and Manufacturers

The number of Internet surfers consulting the Web for healthcare information has been growing faster than overall Web readership, according to Cyber Dialogue.[10] However, healthcare organizations must understand the marketing power of the Web. The goal is to design a dynamic, searchable, easy-to-use Web site that can engage the consumer. A hospital's marble lobby, a clinic's personable staff, even a strong local reputation aren't worth much – if anything – to a point-and-click Web surfer.

Healthcare organizations need to ask themselves: What new audiences, referring physicians, patients, investors or purchasers could I attract with a site that is multilingual, dynamic and speedy?

Many United States health plans and providers are already using Web sites to distribute information, schedule visits and ask questions of nurses.

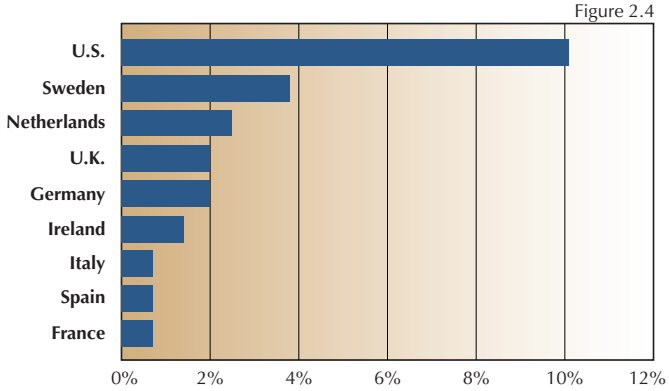
Some healthcare Web sites aim to provide a host of information from different health sources and generate revenue through ads or subscriptions. Trustworthiness is important, and some sites publish their ethics policies to distinguish themselves. Informational Web sites must become part of patient, family and physician learning and utilization of the Web. For example, women often direct healthcare purchases and their use of the Internet is growing dramatically. In Japan, where Internet use is forecast to double between 1998 and 2002, women make up nearly 20% of all subscribers, up from 10% in 1994.[11]

Interaction with Providers and Intermediaries

E-business volume is growing exponentially. (See figure 2.4.) Healthcare providers need to start taking cues from other industries and engage in processes such as "customer relationship management." Because the nature of the Web is two-way communication, physicians' clinics can gather information about patients at the same time as patients gather information about the providers. Large physician clinics can provide links to medical content and know whether patients took the time to download the information. A mother whose son is diagnosed with asthma can receive via the Web a prescription, a link to medical content about the disease and a reminder schedule for communicating with the physician's office. The physician's office can check for compliance and send reminders via the Web on check-ups.

1998 Web Buyers as Share of Adult Population by Country

Figure 2.4



Source: International Data Corp., 1999

Some e-businesses are measuring themselves using a new metric called "information float," which is the amount of time between when data is captured in one place and becomes available in another. Healthcare organizations may begin to measure "information float" in terms of prescriptions, admissions, treatments and other communications with various providers and purchasers.

Already in the United States, some asthmatic children are involved in pilot programs in which their inhalers are embedded with electronic monitors that track dosage and timing. The data is downloaded to a personal computer and transferred to a central database. Algorithms are applied to the central database that identify indications of potential asthma attacks and medical interventions needed to prevent attacks.

In the Netherlands and the United Kingdom, electronic prescription systems for general practitioners are under development. These systems would connect all general practitioners and offer them guidance in the prescription of drugs. Once practitioners and patients begin using the Internet for prescriptions, they'll want to use it for other healthcare transactions.

The Global E-conomy: A Race to the Web

Companies and countries don't have to be monolithically large to compete in the global e-conomy. Systems must be shared, ownership doesn't. That means that small companies and small countries could win the race to the Web because they'll adapt faster than large bureaucracies.

The Euro will accelerate the spread of E-business in Europe, which adapted to the Internet much later than the United States but is catching up rapidly. In terms of healthcare products, pharmaceuticals were the first medical product to be actively marketed internationally over the Internet, but E-business will soon permeate the strategies of most healthcare vendors.

Do You Know Who Your Competitors Will Be Tomorrow?

E-business is already changing the way healthcare organizations market and interact with clients and suppliers. Since 1997, the University of Texas M.D. Anderson Cancer Center in Houston, Texas, has allowed consumers to self-refer through the Internet. A consumer can log onto the Web site, request an appointment and see a specialist in some instances as quickly as three days.

Think about a local community hospital. It probably considers a hospital across town, or even across the street, as its main competitor. But, how much business is it losing to M.D. Anderson or some other Web-enabled hospital? How much of its market share is seeping away unnoticed? All things being equal – such as perception of clinical quality – to what extent will patients exchange the convenience of a local healthcare provider for the quick, customer-friendly attention of another provider? Think about the information that M.D. Anderson is collecting through the Internet on its patients who are electronically registering. How can it use that information about its customers? How can it build a lifelong relationship? How long will it be until M.D. Anderson offers medical consultations over the Internet?

Singapore is in the process of wiring every home, office and factory up to a broadband cable network. The Singapore ONE nationwide high-speed broadband cable network is accessible to 98% of Singaporean homes and offices. "The citizens can transact most of their business with government online, including paying taxes and obtaining passports."[12] Those without computers utilize ones in community centers and libraries, a system that other nations may well consider. "Our vision," says Yeo Cheow Tong, Singapore's communications and information technology minister, "is to transform Singapore into a dynamic and vibrant global information and communications technology capital with a thriving and prosperous net economy by the year 2010 ."[13]

Force #3

Genomics and Biotech Advances Will Shift the Healthcare System from Cure to Prevention

"At a cost of $25 billion (1960 uninflated dollars), Neil Armstrong became the first human to set foot on the lunar landscape. Three years later, the United States took its last manned trip to the moon's surface – and has never sought to return."[14]

In the 1970s, the baby-boomers witnessed one of the most remarkable events of their young lives: a man landing on the moon. That government-funded effort will be followed 30 years later by another blockbuster event: the completion of the Human Genome Project, a $3 billion international endeavor. Just as the space program helped launch a satellite industry that revolutionized communication, so will the mapping of the human genome drastically alter health delivery and wellness. While the mapping itself is a huge effort, the science and discoveries that will fall out of it promise to be breathtaking in the decades ahead.

By 2010, only 20 to 30 treatments and drugs are likely to emerge from genomics, and this type of medicine may only be the province of a few hospital specialists. However, practitioners will be able to see the direction of the pendulum – a time when individuals know their health risks based on inexpensive and readily available testing.

Certainly, there is the possibility that hospitals' bread and butter business of surgery and treating the chronically ill will decrease as genetic screening keeps people from getting ill. The implications for doctors and nurses are beyond what most healthcare economists and policy makers can comprehend.

"Ten years from now, I can imagine a patient comes in with hypertension and I would get a genetic test, maybe even tests on the whole family," says Edward Miller, M.D., dean of the School of Medicine and chief executive of Johns Hopkins Medicine in Baltimore.

Providers will need to anticipate drastic changes in privacy protection and care delivery that will result in markedly different staffing, operations and facilities.

A Primer on Mapping the Book of Life

The human genome is the blueprint for each human being. It consists of up to 140,000 genes and 4 billion units of DNA. DNA are the letters that spell out the "words" represented by genes. Of all the genes found in the human body, 99.9% are the same in everybody. The remaining 0.1% is what makes all the difference.

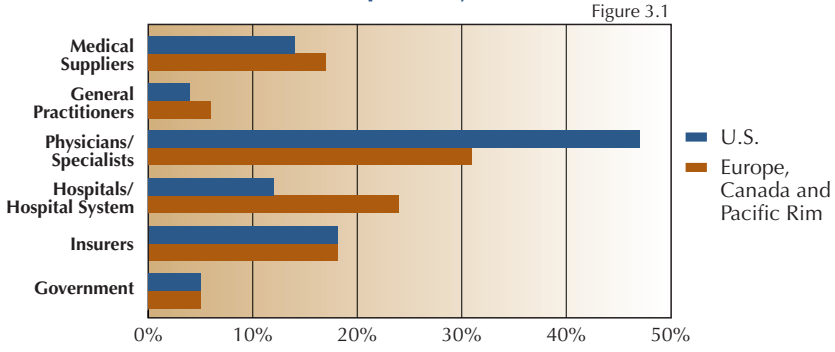
While DNA words are important, they're not as bankable as DNA words with typos in the lettering. Single letter differences in DNA are the ore of the coming genomics' gold rush. (These typos even have their own acromyn – SNPs for single nucleotide polymorphisms.) Think of SNPs as the rare coins with flaws that prompt collectors to bid up their price. It is these single-character flaws in DNA that cause inherited disorders affecting millions of people, diseases such as cystic fibrosis and sickle cell anemia. Find a way to repair or turn off a gene causing those maladies – the profit potential will be millions, maybe billions.

For a decade, the researchers of the Human Genome Project have been reading each and every gene, writing down all 4 billion of the characters in proper order. As one can imagine, computerization has greatly speeded up this process. The project was scheduled to map the entire human genome by 2005, but is now scheduled to finish in 2002. Spurred by competition from a private firm, Celera Genomics, that was also mapping the genome, scientists from the project were spurred to finish faster. A working draft of 90 percent of the human genetic map is set to be completed by spring 2000.

Physicians will have an integral part in the genomics revolution. Health leaders surveyed in the HealthCast 2010 survey said they believed that physician specialists would be most impacted by genetic mapping and that physicians would be the most likely source for consumers to get their genetic maps. (See figures 3.1 and 3.2.) However, physicians will have plenty of competition. United States health leaders believed slightly more strongly that third-party businesses would be the primary source for such maps, according to the survey.

Physician Specialists Viewed as Most Impacted by Genomics

Figure 3.1



% of Respondents Who Believed Segment Would Be Most Impacted by Genetic Mapping

Source: HealthCast 2010, PricewaterhouseCoopers

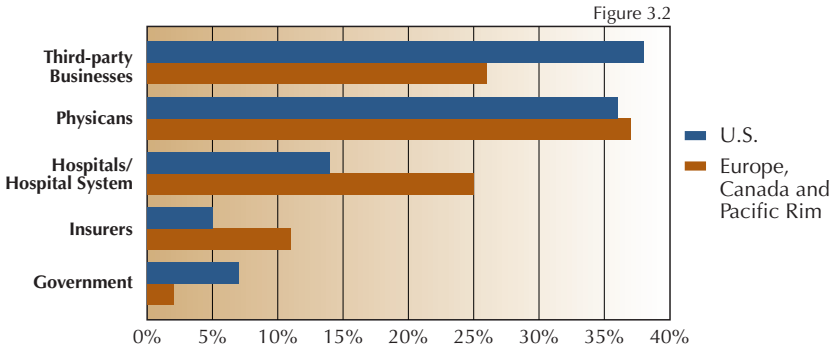
Genomics will open markets for diagnostic testing, preventive medicines, follow-up treatments and even support services such as lifestyle counseling. The businesses of life sciences and information technology will fuse into a glorious era of biotechnical discoveries in the decades ahead, restrained only by the financial purse strings of government agencies, private foundations, pharmaceutical companies and equity investors.

The discovery of the human genome map may be equivalent to discovering the "missing link" for healthcare informatics. The human genome map is an operating system map for the human body, enabling healthcare providers and product companies to customize healthcare for each individual.

With computer-generated molecular libraries and chemical screens, in silico tests for toxicity, metabolism and bioavailability, and virtual clinical trials, the role of "traditional" chemistry will change beyond all recognition. And, the industry will demand far different skills for caregivers and researchers.

Physicians, Third-Party Business Viewed As Most Likely Sources for Individual Genetic Maps

Figure 3.2



% Who Said Segment Was Mostly Likely Entity for Individuals to Receive Their Own Genetic Maps

Source: HealthCast 2010, PricewaterhouseCoopers

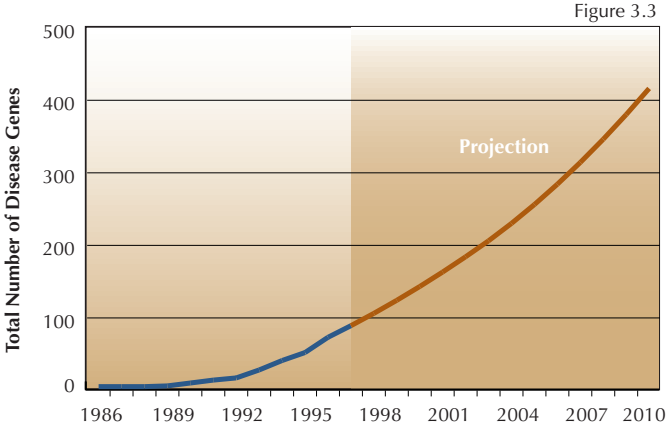
Knowledge management departments will be vital for all healthcare organizations, as the sheer volume of data explodes. Advances in combinations of chemistry and high throughput screening mean that by 2010, it will be possible to screen one million times as many compounds as are processed at the end of the 20th century. Figure 3.3 shows the growth in the number of genes disease through positional cloning, a process in which scientists map disease-linked genes to a specific chromosome.

Genetics + Consumerism = Prevention

Welcome to the world of pharmacogenetics. By 2010, individuals will know much about their genetic profile, which enables their doctors to prescribe the best drugs for each patient. In the distant future, a patient's genetic profile may be used to design a custom drug for each individual, a prospect that is likely to ignite investments in personal drug design software for physician clinics, labs and hospitals. Experts anticipate major diagnostics advances by 2010 as more tests are developed for genomics variations with infectious disease, cardiovascular disease and cancer being the primary applications.

Projected Number of Disease Genes Identified

Figure 3.3



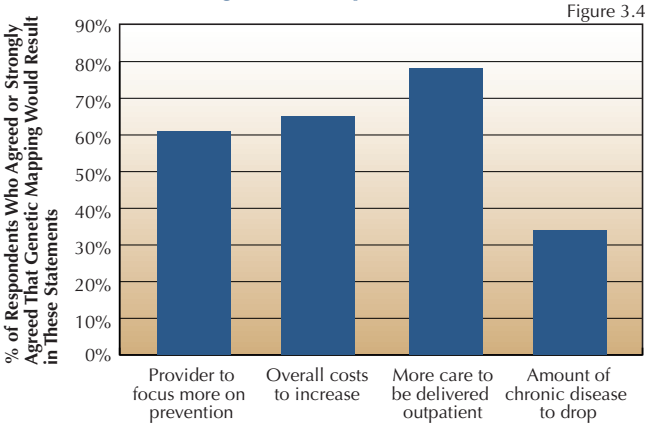
Source: PricewaterhouseCoopers estimate based on data from National Human Genome Research Institute.

Individuals will begin to understand their own genetic maps and their own risk for diseases that have genetic triggers. Mr. J. Consumer, whom we met in a previous section, must face the fact that his genetic profile pre-determines him for certain diseases, but his own behavioral decisions can influence the occurrence or severity of those diseases.

"Knowing your genetic profile will be a great motivator," says Sam Broder, M.D., executive vice president of medical affairs for Celera Genomics, a United States company engaged in gene sequencing. Celera plans to compete with other firms, including hospitals and physician clinics, to provide genetic mapping services to individuals.

By 2010, Genetic Mapping Seen as Increasing Costs, Outpatient Care and Prevention

Figure 3.4



Source: HealthCast 2010, PricewaterhouseCoopers

Consumerism, enhanced by the Internet, will create global patient communities that can aid gene research. The creation of such communities will speed clinical trials and could attract international funding from sources that formerly weren't investing in this sector.

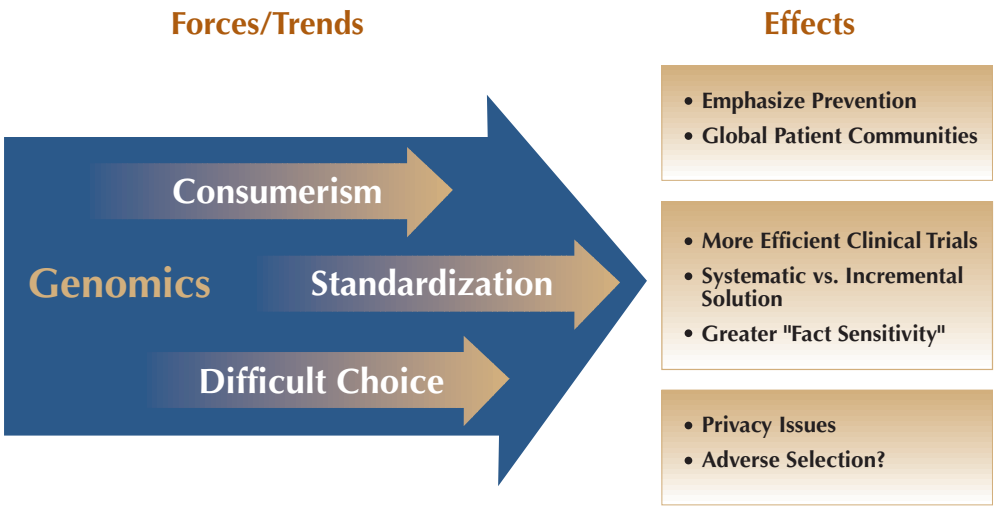
The effects of genetic mapping won't be clear for decades. However, health leaders responding to the HealthCast 2010 survey see costs increasing and care moving to more outpatient settings. (See figure 3.4.)

Genomics + Standardization

Mapping the human genome will mean "more rational medicine and research opportunities. Medicine will be a much more efficient process. We can avoid incremental progress, particularly in cancer where we have had to keep chipping away at the problem," notes Broder, who formerly headed the National Cancer Institute.

"Much effort to date has gone into research that has yielded only marginal improvements," adds David Naylor, M.D., dean of medicine at the University of Toronto and former CEO of the Institute for Clinical Evaluative Sciences. "The post-genomic revolution will mean it is time for medicine to move out of its current poking, prodding and plumbing mode."

Medicine will benefit from the standardization of a human genome map that will enable care-givers to provide the personalization that consumers want. Drugs can be tested on a specific population of people who have a certain genetic make-up, shortening the clinical trials process. "The role of the doctor will grow in effectiveness because he or she can more intelligently respond to a patient's needs," Broder says. "The doctor will no longer say, 'Mrs. Jones, this is what I do for everybody with your condition. Twenty percent of patients respond this way, 30 percent respond this way…'." Future doctors will say, Mrs. Jones, this is what should work 100% of the time for someone with your condition and genetic make-up.



Broder notes that physicians will have to be more "fact sensitive," deriving and updating most of their knowledge from Web sites and palm-based computers. Celera aims to be one of those websites, delivering information to physicians, as well as patients, on a subscription basis.

While research costs might be cut by a more efficient system of clinical trials, barriers still await. The process of going through the Food and Drug Administration in the United States and other approvals in Europe is still lengthy. Private industry is counting on the ability to patent certain genes and gene sequences, although that's a controversial subject. Under current law, the United States Patent Office and international patenting agencies allow the discoverers of genes to patent them and thus retain intellectual rights to using the information.

Genomics + Difficult Choices: More Questions Are Raised Than Solved…

Emotional moral questions about genetic screening for employment, insurance policies, marriage licenses and government services will nag at each nation's conscience. Solutions are not yet apparent, even though we may soon be overwhelmed with new ways to use or misuse genetic information.

Genetic Mapping Pairs with Other Technologies

While the genomics revolution will be startling in itself, its discoveries will couple with other medical technology and biotech breakthroughs that will dazzle the industry and accelerate change. The power of two or more discoveries creates a chemical reaction. After all, how successful were organ transplants before cyclosporine, the anti-rejection drug?

Other revolutions that will tag team with genetic mapping's breakthroughs:

- *Nanotechnology*. Many researchers are talking about "nanodoctors" who will practice a new specialty called "nanomedicine." Nanomedicine is "the monitoring, repair, construction and control of human biological systems at the molecular level, using engineered "nanodevices" – almost like mini-submarines.[16] Nanomedicine experts speak in terms of nanorobots, millions of which may be in a single dose. Nanodoctors would program the nanorobots' on-board computers that are powered by their ability to metabolize local glucose and oxygen for energy. "Each species of medical nanorobot will be designed to accomplish a specific task."[17]

- *Genetically-altered animals*. Transplant experts are currently getting ready to perform xenotransplants using livers, kidneys and hearts from genetically appropriate pigs. "This development opens up a situation with a potentially unlimited supply of organs for transplantation. The key constraint in the future will be what healthcare can we afford," noted Michael Guerrier, Toronto Hospital's chief operating officer.

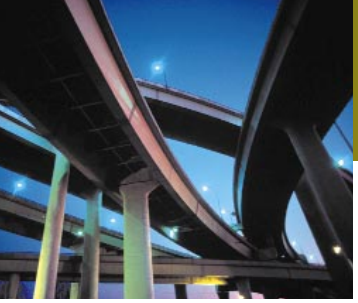
- *Imaging advances*. By 2010, a range of three-dimensional, digital technologies will help practitioners make better decisions and do more precise work in less time. Simple X-rays, MRI and CT scans, or more advanced computer data will fuse with real-time video and be shared much faster than the time it used to take a patient to walk down to a hospital's radiology department.

- *Biomaterials and tissue generation*. Those with heart disease may have the option of cardiac vessel regenerative tissue implants, which will replace clogged arteries without bypass surgery or angioplasty. Regenerative tissue implants will also have tremendous applications for paralysis victims. Biodegradable materials, such as polymers and corals used as scaffold are seeded with specific cultured cells to build tissues, bones, veins, arteries and even complete organs like livers, bladders and ultimately the heart. In effect, we will create our own spare parts.

Certainly, many will be watching the experiences of Iceland, where the government has contracted with private industry to create a database that combines medical, genealogical and genetic data. Iceland's experience is unique because most of its nearly 300,000 citizens are related to each other if you go back eight generations or so. Icelandic citizens may opt out of the new database, but its government is promoting the benefits as better overall health at less cost. Still, questions abound as to who will have access to the data and how such a database should be run. The Iceland government has given deCODE, a genomics research company that is aligned with Hoffmann La-Roche, a 12-year monopoly on building the database.[15] Given Iceland's experience, governments must wrestle with the question of to what extent do privacy issues override a more efficient basis for population health management?

There's also a concern that insurance companies will blackball consumers based on their genetic profile. "That's a myth. Our ability to underwrite has been reduced to negligible proportions," says Anthony M. Marlon, M.D., chairman and CEO of Sierra Health Services, a Las Vegas-based health maintenance organization.

Yet, some worry that the opposite may be true, resulting in adverse selection. Will individuals who find they're predisposed for certain conditions buy extra insurance and those who have healthy profiles buy less?



Future Trend #1

Health Insurance Financing Trends are Converging as Europe and Canada Become More Privatized and the United States Becomes More Governmental

The United States has been the only country in the industrialized world relying primarily on optional employer-based health insurance. Access to care is not a legal right in the United States as it is in Europe, Canada and most other industrialized nations. However, a safety welfare net system exists for the poor and elderly.

In the rest of the world, access to healthcare is a right for all citizens paid for either by social insurance funds with member and employer contributions or from tax funding. Most of these systems allow for private medical insurance either by opting out of state-sponsored schemes or as additional health insurance schemes that provide additional benefits or reimbursement.

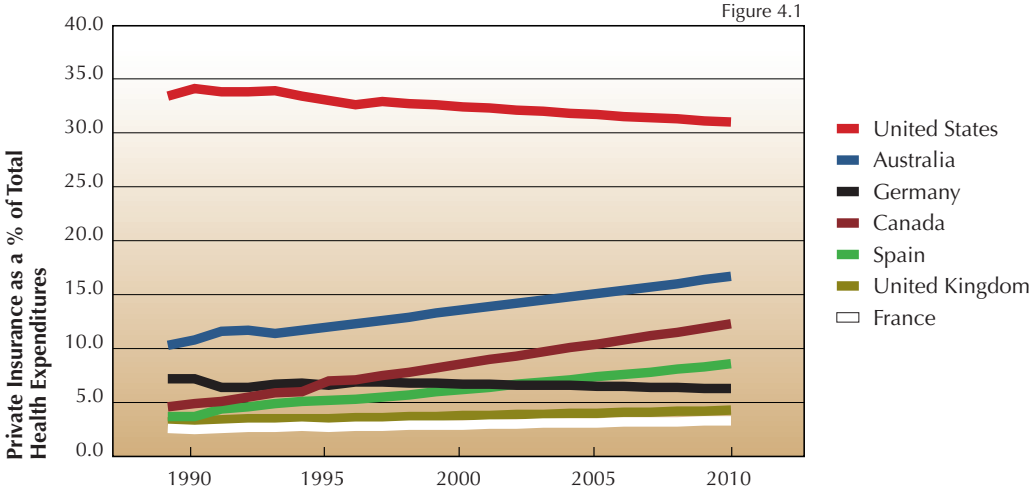
However, in the coming decade, these two different health financing systems will start converging. The United States will look a bit more like Europe and Canada. In turn, Europe and Canada's systems will embrace more aspects of the United States' system.

Government Control Strengthening in the United States

In the United States, more costs and decisions about health will shift toward government purchasers and consumers. Rising costs, changes in the workplace and the age of workers themselves are contributing to this shift. Baby boomers start turning 65 in 2010, moving more Americans into a government-funded system. The shift toward government as the primary payer is already under way. In 1997, government programs in the United States accounted for 46.4% of health spending, up from 40.5% in 1990. In addition, the United States government has been taking a stronger role in the regulation of private healthcare, with recent examples being the mandated 48-hour maternity stay, mental health coverage requirements and the much-debated Patient Bill of Rights. This is a sea change from regulation of private insurance, which previously rested with state governments.

Market Share for Private Insurance Slides in the U.S. While Increasing in Europe

Figure 4.1



Source: Organisation for Economic Co-operation and Development, Paris.

In some European countries, higher income groups are required to buy private medical insurance. In other countries, such as Spain, Italy and the United Kingdom, it is optional and patients receive higher-end services such as private rooms, choice of specialists and faster access to treatment. In France, mutual insurance schemes are used by many people to cover co-payments which also reflect the standard and level of service offered; for example, some specialists with high levels of skill receive higher than usual co-payments. Across Europe, private medical insurance covers about 10% of healthcare costs and is growing at about 5% to 7% per year, with higher rates of growth in fields such as long-term care insurance where public funding is often very limited.

As national health systems encounter increasing funding problems and are faced with ever expanding options for medical treatment, one response has been to increase co-payments for services as in the case of France and the United Kingdom. Another approach is to attempt to set limits on the types of treatment to be covered. Any attempt to limit access to services has proven to be very controversial.

However, many commentators believe that an overt approach to limiting certain services would be preferable to the ineffective regulation of demand by waiting lists, which have been growing in the United Kingdom, Denmark, the Netherlands and Italy. While waiting lists can divert demand to the private sector, they also lead to higher costs because patients may require more acute care when they are treated.

The convergence is illustrated in figure 4.1, showing the amount of private insurance in various countries. While the percentage is falling in the United States, it's rising slightly in other developed nations. Although the lines won't meet by 2010 or even 2020 without some cataclysmic event, the United States and those countries with universal access are moving closer together on a number of issues, payment being one. The United States government is increasingly absorbing more costs and control as the population ages. Meanwhile, in those countries with universal access, privatization is taking a larger share of overall health costs.

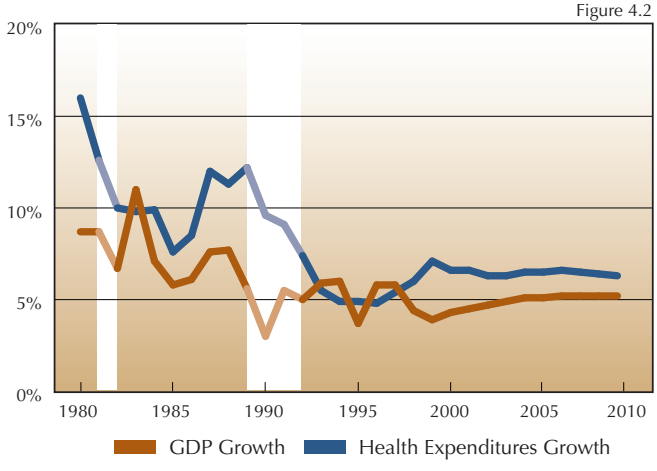
Two Types of Payers Emerge

These trends mean that most of the industrialized world will have both a strong federal health program as well as private, market-oriented one. As providers in the United States can attest, this can make them slightly schizophrenic, catering to the demands and payment systems of different constituencies.

However, both governments and private insurers will use the fact that patients demand less when they pay more out-of-pocket for certain discretionary services. Demand will fall if prices (in the form of co-payments, premiums or deductibles) go up, a market tenet that can be used to temper rising costs.

Actual and Projected Growth in U.S. Health Expenditures and Gross Domestic Product 1980 - 2010

Figure 4.2



Source: HCFA, HCFA and PricewaterhouseCoopers Projections

In addition, government and private purchasers need to be aware of how the private/public mix of payment can be radically affected in a recession.

As illustrated in figure 4.2, national health expenditures rise at a much higher percentage than other spending during the recessions. This certainly happened during the recessions of 1981 and 1982 and again from 1989 to 1992. Workers, who are unsure about the continuity of their jobs and their health insurance coverage, use more healthcare services during a recession.

Privatization Will Grow Amid Government Health Programs in Europe and Canada

A type of "passive privatization" is oozing into countries that have prided themselves with the policy of universal health access. For example, Canadians now spend $24 billion on private health spending, accounting for more than 30% of the country's total health bill.[18]

"When we at the Heart Institute can no longer accommodate patients, we send them to a private supplier," says Wilbert Keon, director general of the Ottawa Heart Institute. "This is a huge problem for our seniors right now. We are losing $2 billion a year, mostly out of Ontario. This is not because Ontario has the longest waiting lists, but because Ontarians have the most wealth."

Forks in the Road

- Tax credits encourage the uninsured to buy health insurance.
- Government requires all employers to provide health insurance.
- Governments mandate citizens go through managed-care organizations.

The shift to more privatization means that many European countries will move to multi-tiered systems by 2010. Already policy makers are discussing covering citizens for a basic benefits package, which includes limited amounts for prescriptions, hospital care and physician services. For care above the levels provided by those basic packages, citizens would have to foot the bill or purchase an umbrella policy.

"The development in the last 10 years has shown a dwindling number of sick funds and health insurers in the Netherlands," notes M.W.L. Hoppenbrouwers, vice-managing director Strategic Policies and Development, Zorgverzekeraars, the Netherlands. "Within 10 more years, the number of health insurers will be reduced to about 10 main health insurers. The new framework could only succeed when the maneuverability for health insurers is large enough to provide additional health policies besides the basic standard healthcare package set up for every citizen. In this new healthcare system, the purchasers will exercise more influence and control in managing healthcare systems at the expense of governmental influence in healthcare systems."

The move to more private health insurance is spurred by employers in Europe who want to create better labor conditions and keep employees as healthy as possible. They see health insurance as a tool to attract and retain employees as labor becomes an increasingly scarce commodity. However, they will require a more thorough analysis of their benefits structure as they examine the options and alternatives of providing benefits to an increasingly vocal workforce under a quickly changing healthcare system.

Tiers of Care Will Break the Surface of Equal Access

Singapore officials are using a three-tier medical safety net, comprising the 3 Ms (Medisave, Medishield and Medifund). This "co-sharing" financing system ensures that the patients share in their healthcare costs and thus avoid the perception that medical services are "free."

Another approach to tier contributions is under development in Australia, where the government wants to regulate the healthcare process through a Lifetime Community Rating. Under this arrangement, individuals who enroll in health insurance while young would pay a lower rate throughout their lifetime than those who postponed membership until older.

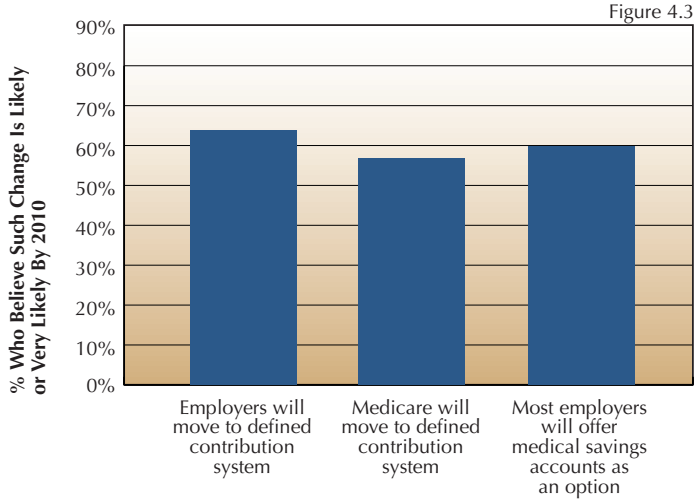
Some United States health plans already require different tiers of pricing in which patients pay less when using a preferred list of providers and more for other providers. In addition, some plans have instituted three different amounts for drugs, depending on whether they're generic, name brand or non-preferred name brand. The co-pay for non-preferred brands can be as much as $50, certainly a leap from the $5 or $10 co-pay that United States consumers had been used to.

Although Employers Will Still be a Major Source of Health Insurance for Americans, They Will Cede More of the Control and Cost to Government and Individuals

When healthcare inflation was spiraling wildly out of control in the 1980s, employers contracted with managed care organizations that promised to rein in the costs. By and large, it worked as health inflation tempered between 1994 and 1998. Employers also tried to demand quality from providers through coalitions that demanded report cards and information. However, health inflation spiked back up in 1999 and some employers became frustrated with their quality efforts. As a result, employers are shifting to workers more of the cost and the responsibility to demand quality. This ties in with the empowered consumerate discussed earlier.

U.S. Healthcare Leaders Anticipate Insurance Changes by 2010

Figure 4.3

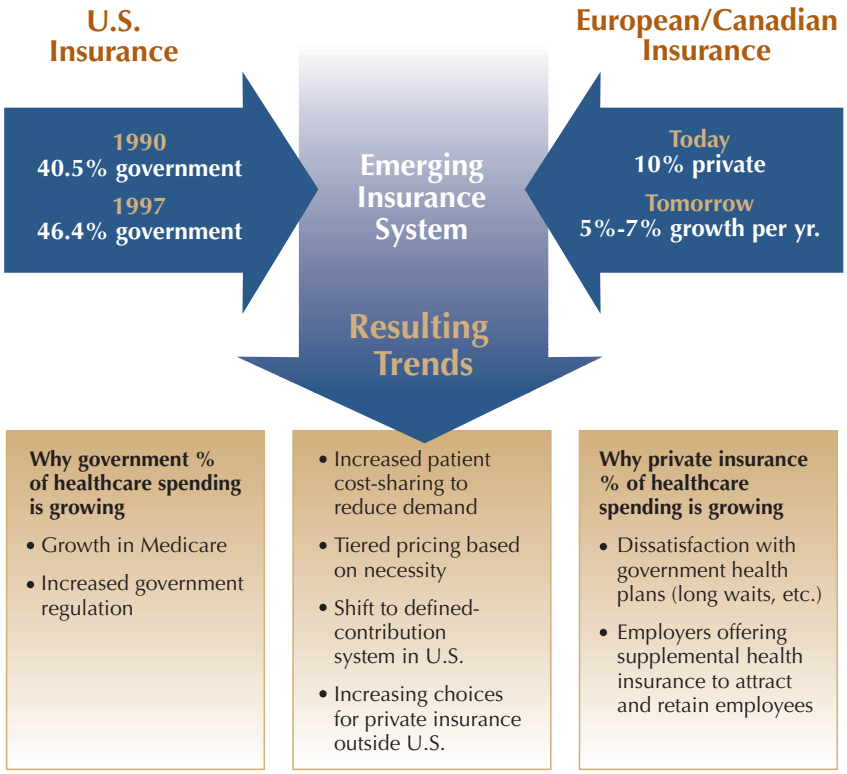


Source: HealthCast 2010, PricewaterhouseCoopers

Still, "the ability to live better and better across age groups will mean fewer disabilities and increased productivity. So, although employers' direct healthcare costs will grow, they will be offset by gains in other areas that also impact the bottom line," says Mary Jane England, president of the Washington Business Group on Health. However, she says more employers will judge health plans by their "ability to keep people working."

Defined Contribution Programs Will Emerge in Healthcare

During the past five years, most employers have moved their retirement programs from defined benefit to defined contribution. Through these programs, employees take responsibility for their investments. "I think an awful lot of people think the defined contribution program is the way to go," says Edward Miller, M.D., CEO of Johns Hopkins. "Moving to defined contribution in pension plans has been very successful."



Moving to a defined contribution program may allow employers to better control their cost obligations of providing healthcare benefits. "Health benefits are becoming more of a dissatisfaction of employees," says one employer who spoke of the hassles of negotiating coverage denials with insurers on behalf of workers.

"There is a better than 50% chance that we will see a defined contribution system in Medicare by the year 2010," says Dr. William Roper, who formerly headed the agency that administered Medicare in the United States. Margaret O'Kane, president of the National Committee on Quality Assurance in the United States, agrees: "Medicare will definitely be voucherized by 2010. The rest of the system could go either way. But, the role of employers as the base of private health coverage will erode significantly."

A significant number of health leaders responding to the HealthCast 2010 survey believe employers and Medicare will move to a defined contribution system. (See 4.3.) In addition, most believe employers will offer medical savings accounts as an option.

The Percent of United States Employers Offering Retiree Medical Benefits Will Continue to Drop

Most employers in the United States are contemplating how to reconfigure or reduce retiree medical benefits. Although Medicare pays for acute care, it does not pay for outpatient drugs, a cost that has been growing rapidly for seniors. However, for a majority of retirees, that cost is offset by medical benefits paid for by their former employers. As the population has aged,

some companies have found themselves with as many retirees as active employees, creating a growing financial liability for them. The rub comes in that many of the new generation of high-tech companies don't provide retiree medical benefits, and if they start, they're likely to be entirely employee-financed. One rationale for not providing them is that the once strong bond of employer-employee loyalty is evaporating; few stay with an employer for life anymore.

For that reason, employers are mulling over the following changes in retiree benefits:

- Charging retirees, if only a minimal amount such as $5 a month, for health benefits.
- Changing the retiree medical plan to make it as restrictive or more restrictive than the active plan, i.e. the inclusion of a drug formulary and mandating the use of a provider network. In the United States, most employees have no other choice but an HMO, while retirees can stay in Medicare's traditional fee-for-service plan.
- Increasing the premium for retirees to stay in the medical plan. In the United States, employers could make their retiree benefit premium so high that they drop out and rely solely on the government for healthcare.
- Dropping a retiree medical plan for new hires.

Future Trend #2

Health Processes Will Be Standardized as the Science and Measurement of Medicine Improves

Empowered consumers will demand to know more about the treatments proposed for them, their effectiveness and the track record of the medical team offering the treatment. This will accelerate the demand for the standardization of health processes despite resistance from some doctors to "cookbook medicine." Governments, health purchasers and insurers will also support standardization because without common platforms and benchmarks, inefficiency and costs will continue unchecked. That's why the 21st century will abound with new rules, protocols, and care paths aimed at the overuse, underuse and misuse in healthcare processes. Common computer interfaces in use in other industries will lead to a more connected world in which health data can be exchanged, measured and updated. With benchmarks, consumers and physicians can make personalized health decisions in a more objective manner without the wide variations that currently exist.

Common platforms will facilitate two-way communications. Ideally, information will be sent, collected and analyzed in a secure electronic format that both patient and provider can use. If privacy concerns can be overcome, this will drastically re-engineer the traditional relationships.

"In the future, we're going to go to the doctor's office a lot less often, but we're going to send him data more often,"says Newt Gingrich, former United States Speaker of the House.

Technology Is Ready and Waiting for Healthcare to Embrace It

The concept of compiling and updating standardized patient information using a common platform is already a reality in Europe. One of the largest deployments of technology in healthcare is under way in France where the government has issued 40 million Sesam Vitale health smart cards and is in the process of distributing 12 million more over the next three years.

Forks in the Road

- Privacy legislation and lawsuits prevent sharing of medical information among providers.
- Information systems fail to produce common standards for healthcare.

And France is not alone. Governments in Spain, Germany, the Czech Republic and Russia are either implementing or piloting health smart cards. Spain's is the first to use biometric technology – scanning an individual's fingerprint as a security check.[19]

Smart cards have microprocessors that experts say make them more versatile, reliable and secure than the swipe credit cards that are popular in the United States. These microprocessors enable the cards to store, process and exchange data, a natural application for health records. New technology has made them contact-less, meaning they can be read by holding the card up in front of a reader device. The French cards don't contain a complete medical record, but they do have enough medical information for an emergency.

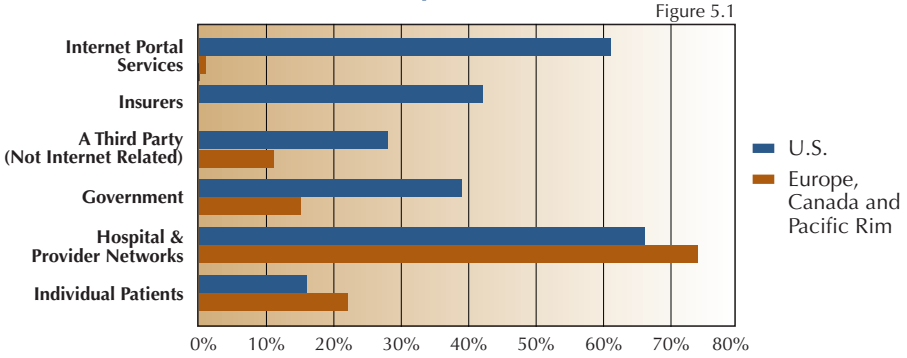
In France, 50,000 health professionals also are being issued smart cards that give them access to a centralized patient record warehouse.

Another smart card project is the DIABCARD project, which is focused on patients with diabetes mellitus and cardiovascular diseases to enhance cooperation between healthcare professionals involved in the care of those patients. The DIABCARD has been implemented in Austria, France, Germany, Greece, Italy and Spain.

Smart cards, combined with telecommunications advances, will give healthcare providers a far less expensive way to communicate and learn from each other.

Most Likely Medical Records Warehouse in 2010 Viewed as Internet Portals and Hospitals in U.S.; Hospitals and Patients in Europe, Canada, Pacific Rim

Figure 5.1



Source: HealthCast 2010, PricewaterhouseCoopers

The electronic patient record fosters the need for data warehousing. Health leaders, particularly in Europe, believe hospitals are most likely to fill that role, according to the HealthCast 2010 survey. However, in the United States, survey respondents believed Internet portal services are a strong competitor. (See figure 5.1.)

Standard-Setters Will Need to Reflect the Views of Consumers and Doctors

Guidelines are becoming more meaningful, more outcomes-oriented and more granulated. Thought leaders know the need is pressing: "We don't know what is happening to our inventory [of patients]," notes Marjorie Beyers, executive director of the American Organization of Nurse Executives. "We've got to be learning what people use the system for."

In the United States, the National Committee for Quality Assurance, which issues report cards on managed care plans, has increased the participation of plans in its survey, as well as the degree of detail in the reports. Breast cancer screenings, immunizations and the use of beta blockers after heart surgery are among the quality indicators for which it grades some 400 HMOs. By 2010, we expect this grading system to become even more detailed or personalized for consumer interaction.

In the United Kingdom, the National Institute for Clinical Excellence was established in 1999 to review new treatments that would be made available across the National Health Service. Its first analyses will be of 13 drugs and procedures, including hip prostheses, hearing aids, extraction of wisdom teeth, coronary artery stents, asthma inhalers for children and interferon beta for multiple sclerosis. The United Kingdom Department of Health noted that NICE is designed to move toward a system that is "based on need and need alone, not on who your general practitioner happens to be or on where you live."[20] NICE and its sister organization, the Commission for Health Improvement, both have consumers, as well as doctors and nurses, on their boards and aim to take a patient-centered perspective.

Standardization + E-business = Speedy Dissemination of Information

The publishing of "report cards" in healthcare is ballooning on the Internet. Through the point-and-click sorting of the Internet, consumers can get the meaningful information they need. "There are much more mass media approaches for disseminating healthcare information," says Ronald Peterson, president of Johns Hopkins Hospital and Health System. "There is somewhat of a free-for-all emerging."

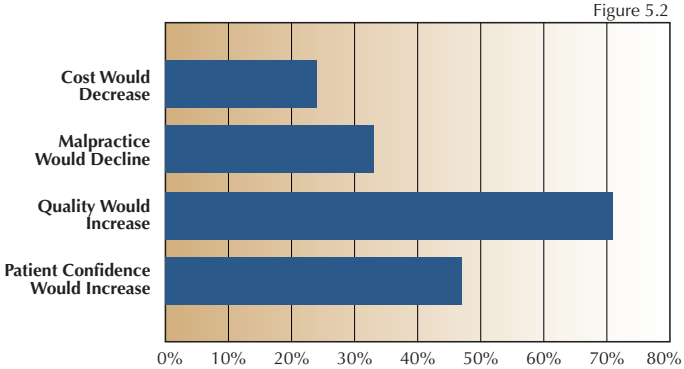
Most healthcare practitioners and purchasers applaud the use of guidelines and the value gains in cost and quality. For example, some American hospitals have recently used bedside terminals to collect patient information and found reductions of up to 80% in medication errors.

The use of computerized, possibly Web-based, decision-support systems is likely to have several benefits, according to the HealthCast 2010 survey. (See figure 5.2.)

Despite the support for standard guidelines, the unity ends when the tough questions come up about who develops standards, who pays for their development, how are they applied or are they mandated. "We will see guidelines and protocols applied in different contexts, but they will need to have enough flexibility to not limit physician alternatives," says Joan Rodes, M.D., a renowned medical researcher in Spain and director of la Fundacio Pi Sunyer de la Corporacio Sanitaria Clinic. "We are at risk of misunderstanding evidence-based medicine with obedience-based medicine," adds Alicia Granados, a director of one of the most active technology assessment agencies in Europe, Catalan Agency for Health Technology Assessment.

Quality, Patient Confidence Would Benefit from Physicians' Consulting Decision-Support Software

Figure 5.2



% Who Agreed or Strongly Agreed with Above Statements If Physicians Routinely Consulted Computerized Decision-support Software by 2010

Source: HealthCast 2010, PricewaterhouseCoopers

Patients feel comfort in treatment guidelines, but surveys have shown that they want doctors, not government or insurance companies, to formulate those guidelines.

Even then, issues arise. For example, "every cardiac patient, if there is evidence of heart disease, should be on ACE inhibitors," says Wilbert J. Keon, M.D., general director of the University of Ottawa Heart Institute. "Yet, only 5% are. ACE inibitors cost $200 to $300 a month. The Ontario Cardiac Care Network designed excellent disease management framework for Ontario – but it was never fully implemented because of its cost. There is a conflict between what is good for the individual and what is good for government."

One big question is how standardization will alter the industry's compensation models. Will it move healthcare to commodity pricing? Maybe not, but "we will see a demystification of what is medicine," predicts Nancy Formella, senior nurse executive at Dartmouth-Hitchcock Medical Center in New Hampshire.

The combination of standardization and empowered consumers could be very powerful. Once patients understand more of the details of their care, they may shop around for a better value.

This is bound to hurt low-quality providers, but could enable high-quality providers to charge more. This is already happening in other areas, such as higher education. Published rankings of colleges, which have flourished in recent years, spur demand for the top-rated colleges and allow them to increase tuition; while the lower ranked ones may not be able to raise tuition as much as they would have liked because of lower demand.

Standardization Will Have the Biggest Effect on Hospitals as Information Is More Readily Shared and Technology Pushes More Devices and Diagnostics Into Outpatient and Home Settings

One area in which these trends intersect is the laboratory, whose role will be much more automated and much less centralized and less labor intensive. Point-of-care testing, such as hand-held blood and saliva analyzers, will be pushed out to the bedside, the clinic and the home.

Standardization will allow purchasers to determine the most efficient setting of care. In addition, care venues can keep better track of which services they should provide and which should be outsourced. One view is that "instead of large general hospitals with a large number of specialist departments and a large number of inpatient beds, the trend will direct to small, highly sophisticated cure clinics with only three departments: intensive care, surgical/radiology and emergency," says Michael Kuhn, head of the research department of Philips Medical Instruments, Philips Forschungs Labor Hamburg. After a short stay, the patient will be referred to a patient hotel or ambulatory care, he adds.

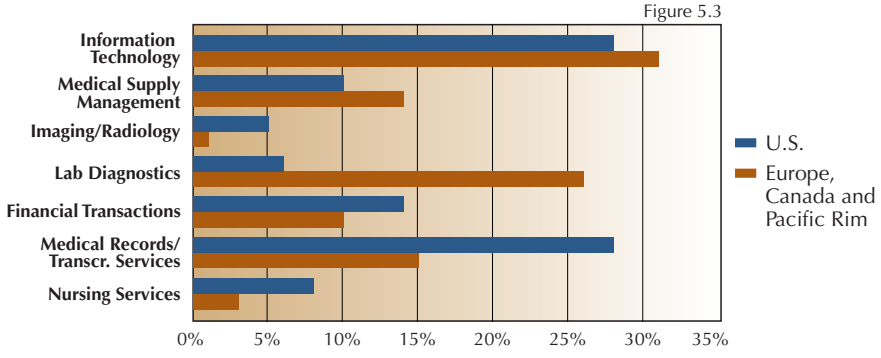
The move to shorter hospital stays will be especially dramatic in some countries. The United States has the fewest hospital days per capita – 1.1 – according to a study by the Commonwealth Fund and 1998 OECD data. That compares to 4.0 in Japan, 2.8 in Germany and 2.6 in France.[21] Length of stay is heavily impacted by payment criteria, and in the United States, health insurers and government purchasers have put pressure on providers to cut hospital stays.

"The outsourcing of some hospital departments such as lab facilities, administration, restaurant and kitchen, purchasing department, facility management, and even nursing staff may become necessary. Hospital managing directors have to become more professional with vision and daring," says Ton Rabelink, a professor of medicine at the University Medical Center in Utrecht, The Netherlands.

The outsourcing of clinical and non-clinical services has been popular in the United States, but not as much in Europe. However, HealthCast 2010 respondents saw continued outsourcing, particularly in information technology. (See figure 5.3.)

Information Technology, Medical Records and Lab Viewed as Most Likely Outsourced Services in 2010

Figure 5.3



% Who Said Service Was Most Likely to be Outsourced by Hospitals in 2010

Source: HealthCast 2010, PricewaterhouseCoopers

"More recently, auto companies have gone into massive outsourcing, keeping the car design as the key piece of their value chain. My hospital has to stake out as much claim as possible to the rules design business and not to be too pre-occupied with the size of its production (health service delivery) activity," adds Michael Guerriere, M.D., chief operating officer of The Toronto Hospital.

Future Trend #3

Workforces Must Adapt to Technology and Empowered Patients

How to retrain tomorrow's healthcare workforce will be one of the most explosive subjects of the next decade as the forces of automation, standardization and consumerism impact the roles of nurses, doctors and administrative workers.

As already discussed in the standardization section, consumers, governments and purchasers of healthcare demand a certain amount of standardization and automation. The challenge for healthcare employers will be to win the confidence and commitment of its professional workforce that clings to traditional professional responsibilities and fears change.

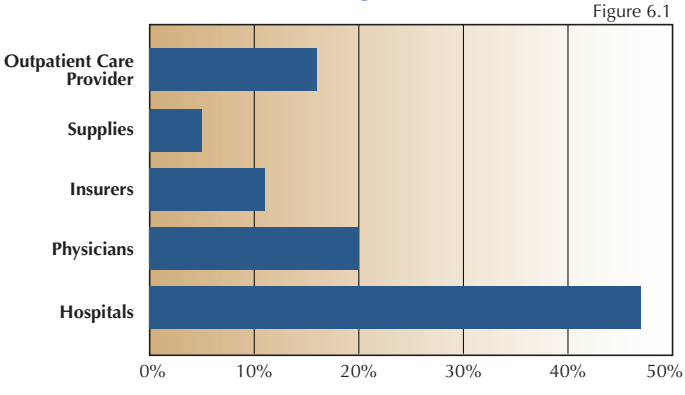
"The most significant rigidities in our present health system, the ones that are most impeding progressive reform relate to the organization of healthcare and the way the work has been compartmentalized among health professions. We have personnel gridlock," notes Steven Lewis, former executive director of Health Services Utilization and Research Commission of Saskatchewan. "Healthcare is an industry in which one category of workers consists of innovators, while the structure and incentives tend to resist innovation."

Manpower Experts Predict New Mix in Healthcare Professionals

Because of projected increases in health spending and aging, most industrialized nations are expected to see an increase in healthcare manpower. However, the types of healthcare workers that will increase will be deeply impacted by technology. For example, the existence of telemonitoring in the home may alter demand for home health aides. The key for healthcare organizations will be using the right mix of different levels of practitioners for the right patients. By using e-health tools or call centers, providers can give care in a more efficient manner. However, the use of such tools must be carefully evaluated because patients are more likely to seek face-to-face intervention for some ailments, such as back pain, than others, such as a sore throat.

Hospitals Viewed as Requiring Largest Restructuring of Human Resources

Figure 6.1



% Who Said Segment Would Require Largest Human Resources[1] Restructuring

Source: HealthCast 2010, PricewaterhouseCoopers

Getting the right mix of professionals for patients is even more critical in the hospital setting. "Twenty-five years ago, only doctors and nurses were in the operating room. Now we have anesthetic, cardiopulmonary, nursing and other technicians with us. That is a good trend. Some tasks can be performed by $30,000 technicians who can be trained in a few months," notes Wilbert Keon, chief executive officer of the Ottawa Heart Institute. Yet, it will be difficult at best for some healthcare organizations to overcome the political battles needed to re-engineer processes, such as surgery, to include lower-paid technicians in roles now filled by higher-paid professionals. Healthcare is known for its turf battles, many of which will be difficult to overcome.

Healthcare leaders responding to the HealthCast 2010 survey believe that hospitals face the biggest restructuring challenge. (See figure 6.1.)

Healthcare manpower problems are not monolithic. Each profession has its own traditions and income structure that will have to be realigned for a more automated future. Physicians are a singular example. The hospital of 2010 may be able to draw on the expertise of numerous radiology experts through the Internet, not just the ones inside the hospital walls. That will change the way radiologists are paid and how they work.

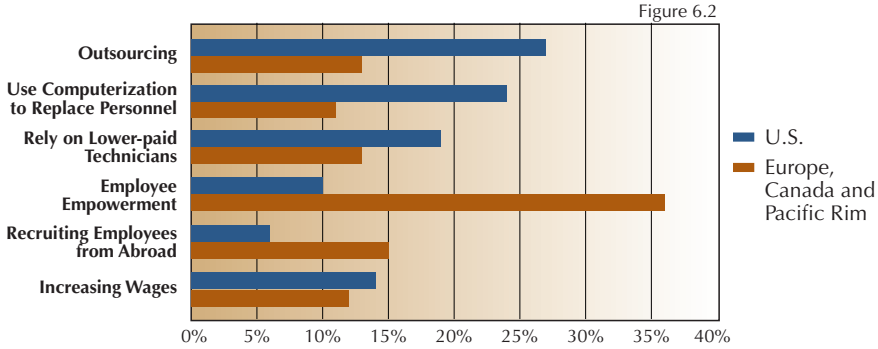
The demand for physicians will vary, depending on venue and geography. For example, in the United Kingdom, an extra 1,000 doctors a year need to be trained to meet future demand, according to the Medical Workforce Standing Advisory Committee. This would require the building of one or more medical schools, or a big expansion of existing schools, the committee stated. However, there is no shortage of physicians in other European countries.

In the United States, the overall number of physicians is viewed as adequate, albeit maldistributed. Some specialities may be in oversupply. However, this may be somewhat of an anomaly since physician compensation in the United States is two to three times higher than in other industrialized countries.[21] As long as such a disparity exists, the United States will be able to recruit top doctors on the basis of income alone. A recent study from the Canadian Medical Association showed that the majority of Canadians believe there is a physician shortage.[22] Experts blamed the aging society and a decrease in the number of medical school graduates. However, Canadian leaders also decry the loss of physicians to the United States, where incomes are substantially higher.

Yet, the supply of physicians isn't easily altered. Doctors typically practice about 40 years, so the supply of physicians in 2010 won't be much different than it is today. In fact, the United States could attract even more physicians because of its higher compensation structure.

European Providers Are More Likely to Empower Workers; in U.S., More Likely to Outsource or Computerize

Figure 6.2



% Who Said That Providers Were Most Likely to Take Above Actions to Solve Labor Shortages in Next 10 Years

Source: HealthCast 2010, PricewaterhouseCoopers

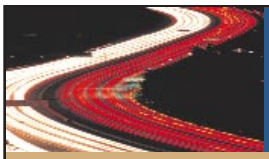
Healthcare May Have Difficulty Attracting Talented Young People

The industry could face a shortage of non-physician healthcare workers if it is viewed as too conservative, not innovative and extraordinarily bureaucratic. Already, healthcare organizations have recruiting challenges for information systems and e-business experts. While other parts of the economy are moving at light speed, healthcare's recalcitrance to embrace technology will force it to pay above-market wages in the long run to overcome other drawbacks.

Healthcare organizations must begin to formulate strategies to attract talented professionals. According to the HealthCast 2010 survey, outsourcing will be most popular in the United States, while employee empowerment programs may be favored in Europe. (See Figure 6.2.) If they fail to attract the people they need, they may have to turn to outsourcing or other means to get the job done.

Work-Life Issues Will Change the Character of Today's Workforce

"The biggest difference for consumers in 2010 compared to consumers in 1999 will be the role and impact of women," notes Mary Jane England, president of the Washington Business Group on Health." Just as we've seen more and more work/life programs implemented in the workplace, we'll see such important consequences of the role of women in the healthcare system."



Forks in the Road

- An economic depressions leads to widespread unemployment.
- A substantial number of physicians opt for employment or form strong guilds.
- Government funding for medical education is reduced substantially.
- Prescriptive authority is expanded beyond physicians and nurses with advanced degrees to other practitioners, such as pharmacists.

In the United States, medical school students have heavily favored the "controllable lifestyle" of specialties like radiology, anesthesiology, dermatology, and pathology. Surgical specialties and others that don't offer such lifestyle advantages will be challenged to do so as more women enter the physician work force.

Women now make up nearly half of all medical students in the United States and more than half in the United Kingdom By 2010, 30% of practicing United States physicians will be women, up from just 8% in 1970.[23]

Apart from physicians, healthcare is a female-dominated industry. However, many hospitals are citing shortages of nurses and other technicians that traditionally have been filled by women. "Nurses are no longer interested in doing shift work," said Ron Peterson, president of the Johns Hopkins Hospital and Health System. "The supply is diminishing at a time when the need is increasing."

The shortfall in the supply of nurses worldwide stems from many factors including poor pay, changes in training, lack of power, resource constraints, image problems, inflexibility in working conditions and poor hospital infrastructure. For example, in the United Kingdom, the shortfall is estimated at between 8,000 and 13,000 out of a total NHS nursing, midwifery and health visiting workforce of 330,000.

Entrepreneurial Urges Will Flourish

Studies have shown that women are more likely to gravitate to smaller, more flexible companies. Yet, that is not the profile of many healthcare institutions. Women are already starting new businesses at a record pace and this type of entrepreneurialism will spill into healthcare. With technology, more women will be able to work at home, and more will choose that over punching a clock in a hospital or nursing home.

Physicians and nurses already are starting to form their own businesses that contract with hospitals and other healthcare organizations. Rather than be employees, they're choosing to be partners. Given the move to standard platforms, as discussed in earlier sections, these types of organizations will be able to work in virtual networks that adhere to industry standards.

The empowered consumerate also may force some change, taking power away from one group of healthcare professionals and transferring it to another. "The consumer will seek out low-cost alternatives. The pharmacist will become an alternative provider even acquiring limited authority to prescribe," predicts Glenna Crooks, a former Merck executive. "Doctors will be increasingly in a consultative role."

Philip Davies, who heads the health policy branch for the Ministry of Health in New Zealand, also sees radical changes for healthcare workers. He adds, "We are looking to nurse prescribing where appropriate to improve access and reduce costs. In the longer term, more flexible labor markets in health might offer the possibility of greater responsiveness provided, of course, reasonable safety concerns can be addressed."

E-Medical Education Will Be in Demand

Computer-based and Web-based education will be the foundation of medical education. Already, some medical schools have adapted to this future. For example, the University of Pennsylvania Medical School has uploaded more than 1,200 hours of classroom lectures, in text and audio formats, and more than 100,000 images – everything from pathology slides to MRIs and X-rays – onto its Internet site as part of its Curriculum 2000 project.[24]

Financing of medical education will require reassessing the need for brick-and-mortar institutions as other venues of higher education adapt to more virtual classrooms. Medical schools will be judged by students on their ability to adapt and prepare students for a future of computerization and standardization.

"Medical schools have not come close to preparing students for the world they are going to face either in terms of the reliance on new technologies or in terms of the expectations of the new consumer," says Richard Alvarez, president and CEO of the Canadian Institute for Health Information. "Electronic service delivery will be the key for treatment of chronic diseases and monitoring treatment compliance. There will be a huge shift to in-home care with the emerging capacity to link monitoring devices to communications devices."

Consumers Will Pay for the Personal Touch

One of the biggest byproducts of an e-connected society is loneliness. As mentioned in the consumerism section, depression is expected to remain a leading cause of disease. Will consumers become even more depressed if human contact is diminished through technology and workplaces are more decentralized?

In banking, the introduction of automatic teller machines has eliminated thousands of jobs, but it hasn't totally eliminated the need for human tellers. Earlier this year, a United States bank laid off 5,800 tellers as it tried to automate the process through ATMs, telecommunications and the Internet. Several months later, the bank decided to hire back 2,000, saying that customers missed human interaction.[25]

Healthcare businesses that stress a personal touch will find a market of consumers with disposable income. "Patients can find information on the Net, but there will still be a need to provide comfort and support," notes Majorie Beyers, president of the American Organization of Nurse Executives. "This places an interesting challenge on health professionals to find ways to provide that comfort and support."

Future Trend #4

The Interaction Between Aging, Technology, and Consumerism Will Force Policy Makers to Make Difficult Choices

The combination of aging societies and the expanding possibilities offered by medical science presents harsh dilemmas for governments, health insurers and individuals. Soon, the issues of how much governments, insurers and individuals should pay to extend life or improve quality of life in old age will be flashpoints.

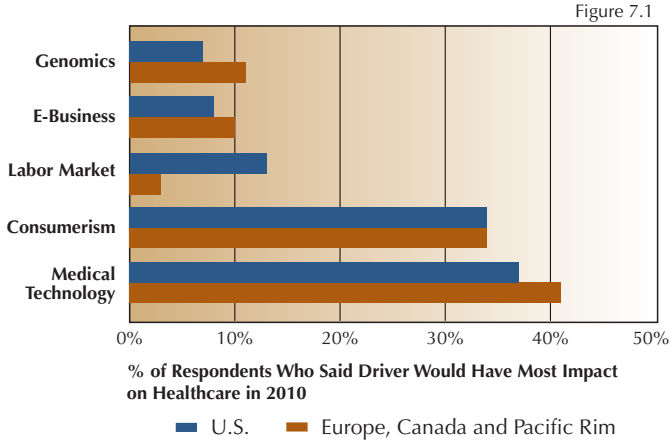
The United States government recently extended the financial life of Medicare, its 34-year-old health entitlement for senior citizens, to 2015. Yet, funding dilemmas are at the doorstep of many countries whose populations are aging even more quickly. Many nations must soon decide how to fund the pensions and healthcare needs of the elderly on the backs of a smaller working population. As healthcare costs ooze upward, they may subtract from spending for conservation, roads, education and other public needs.

Technology Will Extend Life Spans

By 2010, we may be on the cusp of breakthroughs that could extend life by 20 years or more. Scientists see great advances in bioengineered organs, human growth hormone, organ transplantation, artificial skin and bones, gene therapy, and new vaccines. In the HealthCast 2010 survey, technology was identified as having the most impact on healthcare by 2010. (See figure 7.1.)

By 2010, Which of the Following Drivers Will Have the Most Impact on Healthcare?

Figure 7.1



Source: HealthCast 2010, PricewaterhouseCoopers

Interestingly, survey respondents were less enthusiastic about genomics and E-business, two forces we focused on in this report. However, interviews with thought leaders led us to concentrate on those forces in 2010.

Will technology or the promise of future developments prompt fewer DNR (do not resuscitate) orders? Will more of the elderly demand organ transplants at later stages of life? In the United States, the elderly consume about 40% of all healthcare spending, yet in 1988, they used only 2% of the organs transplanted. However, that percentage has been growing rapidly and could climb to 16% by 2010.

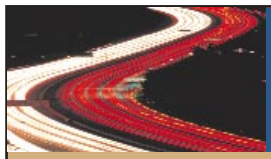
The coming biotech advances could be a well of blessings or a drain of future medical costs.

Still, who will help J. Consumer sort out such choices in light of his or her own moral values? Questions about genetic alterations that affect future generations will certainly raise a need for bioethics counselors who work with practitioners and patients.

Policy makers must look beyond acute and chronic care needs. The "best" healthcare system in 2010 could be the one that provides our empowered consumer with a right mixture or

balance between these four factors: physical environment, social environment, lifestyle and genetic profile. Who pays for what?

"Health spending still has to be balanced against other priorities," adds Philip Davies, deputy director general of policy for the Ministry of Health in New Zealand. "For the Ministry, our role is becoming less hands-on management and more policy direction and stimulus to innovation. Innovation in service provision is often difficult to get going. Many private investors are unfamiliar with the sector, and internally, innovation can be hampered by a shortage of entrepreneurial skills and drive."



Forks in the Road

- Right-to-die legislation is enacted.
- A major recession hits.
- Healthcare costs for some major diseases fall as new technologies cure patients quicker and cheaper.

And governments must explain how it sets guidelines so they aren't misunderstood. "We, the assessment agencies, need to be closer to users, facilitating an easier language to the general population and not only the policy makers," says Alicia Granados, a director of one of the most active technology assessment agencies in Europe, l'Agencia d'Evaluació Tecnológica del Departament de Sanitat Generalitat de Catalunya.

Governments Must Draw the Line

"Clearly medical development is gathering pace but the key question is whether we can react quickly enough to guide and use developments wisely," says John Wyn Owen, who heads the Nuffield Trust, a United Kingdom foundation that does research and policy review in healthcare. "Government will have to face the fact that they can't afford everything."

Many national healthcare systems, including the Netherlands, Norway, New Zealand, the United Kingdom and Germany, are trying to define the core elements that will be covered by tax or social insurance funding. The struggle is making a distinction between basic healthcare needs that are collective and those needs that are an individual's responsibility.

Attempts have been made to introduce citizen juries in the United Kingdom and Norway to review priorities, but by and large the public has not proven ready to accept large limitations on public health services in most European countries. However, certainly in the Netherlands, both the government and health insurers are heading toward a two-tier system: a basic healthcare package and a customized supplementary health insurance

Two-tiered Health System Viewed as Likely in Europe by 2010

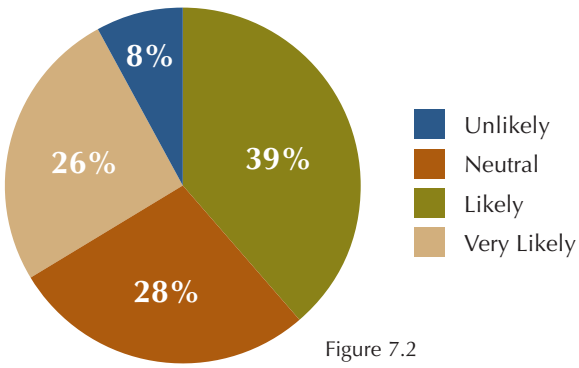


Figure 7.2

% of Respondents Who Believe It Is Likely That Europe Will Move Toward a Two-tiered System by 2010 as a Result of Consumerism.

Source: HealthCast 2010, PricewaterhouseCoopers

system. European health leaders surveyed for HealthCast 2010 believe a two-tiered system will take hold by 2010. (See figure 7.2.)

Yet, the subject of two- or multi-tiered health systems inevitably ignites a debate about some citizens receiving a lower quality of care than other citizens, even though all have been assured access to the system. There are other quandaries. If a consumer pays out-of-pocket for services such as laser eye surgery or treatments for baldness, isn't that diverting industry resources from other healthcare needs? By fostering a market economy in which the rich can afford the best healthcare and everyone else gets average care, where will the money in this system shift? To which class of patient will the best researchers, practitioners and capital move?

Governments also struggle to decide the most effective vehicle for delivering healthcare. "The ability to introduce new technology and expensive new procedures and drugs would depend on the cost effectiveness of primary care in providing effective first-level care, taking care out of expensive hospitals and acting as a gatekeeper for the rest of the system," says Kenneth Scott, M.D., president of the National Association of Primary Care in the United Kingdom.

Either government purchasers of healthcare and providers will be at more frequent loggerheads or they must work more closely together. Look at other industry partnerships. Today, automakers in the United States are working with regional transportation planners to design intelligent transportation systems that benefit drivers. What if government and healthcare providers worked together to design intelligent healthcare systems that benefit patients?

If the system can't be redesigned, the following are alternatives:

- Increasing tax levies to support medical care or other public health systems.
- Paring back of certain health services. For example, governments may increasingly limit what services, drugs and treatments they pay for.
- Passing along more of the costs through higher co-payments and deductibles.
- Limiting coverage for certain conditions or for some individuals who do not take care of themselves.

"People do not necessarily make the connection between taxation and the need to limit health costs," notes Jackie Haynes, chief executive of Buckinghamshire Health Authority, a local agency that buys healthcare services for about 660,000 people in a county northwest of London. Her health authority employs 214 and spends £350 million ($500 million) on health promotion and health services. It is also engaged in moving toward a system of local primary care groups, which are a social form of physician-led HMOs, each serving a population of about 100,000. "NHS Direct (the national medical call system) could also have a major impact on the way people use health services," Haynes adds. " The Health Authority must use this and other channels (such as food co-ops, ethnic groups and interest groups) to engage and enroll people in positive health programs."

The United States Faces Troubling Questions

Healthcare access is not a legislated right in the United States, although HealthCast 2010 survey respondents see that specter on the horizon. "Functionally, we generally have decided that there is a social contract, the objective of which is access to healthcare services for all people," says Dr. William Roper, who formerly headed the United States Health Care Financing Administration. He is now dean of the school of public health at the University of North Carolina. "There will be a

movement to prepare for financing long-term-care as the parents of baby-boomers require long-term-care and then as the baby boomers themselves require those services."

Noted Edward Miller, M.D., chief executive officer of Johns Hopkins in Baltimore: "There has to be a national debate. Does an individual have a right to healthcare? The answer is yes. I think you can sell it. You'd have a healthier workforce, a more stable family. If you would allow access to healthcare in a proactive way, some of the other social ills could be solved. You'd have to set up some minimum requirements such as immunizations."

Still, there are questions on how such a system would work in the United States "To establish healthcare as a right would require a radical transformation when there is no mechanism in government to operationalize it," says Glenna Crooks, Ph.D., founder and president of Strategic Health Policy International, a Washington, D.C.-based consulting group, and formerly vice president of worldwide operations for Merck's vaccine business.

Consumerism + Difficult Choices = A Political Voice

The empowered consumer movement raises all sorts of issues about autonomy, spending of personal resources, and the extent of entitlements. How many financial and human resources should be shifted away from other endeavors to pay for five or 10 or 20 more years of life for someone age 65 or 85 or 95?

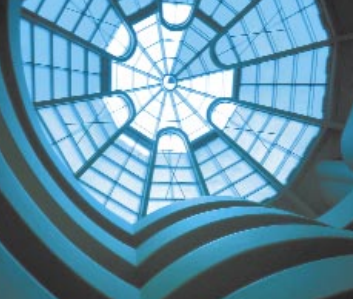
Can governments simply draw the line at basic benefits and let individuals pay out-of-pocket for the rest? Could they demand a quid pro quo in healthcare – meet these health requirements to gain these health benefits?

"We need to convince the public that there has to be a cap on what the state can afford and then open a debate on where limits should be set," says New Zealand's Davies.

Difficult choices means controversy, which is likely to spur more media coverage of health issues. That will prompt elected representatives to respond. On both sides of the Atlantic, patients' rights are an important theme. In Europe, patients want a greater say in selecting their physician, hospital and course of treatment. They are also becoming more involved in health policy decisions. Legislation to codify patients' rights is in discussion in several countries, including the United States.

By way of precedent, consumerism is pervading other United States institutional structures, such as the publicly funded school system. In several states, legislatures have permitted charter schools where local groups can self-direct their schools. Even though parents don't purchase teaching services like they purchase notebooks, consumers have worked for change and choice, a theme that is resounding in healthcare as well.

As with schools, post-war baby boomer consumers will voice their satisfaction or lack of it because they simply do not have the automatic respect of the healthcare institutions their parents did. Notes John Wyn Owen, a former director of the National Health Service Wales: "Consumers will be more suspicious of government as a provider of services and will demand more information and more choice."



2010 Implications

The Three Forces of Change and Four Future Trends outlined in this report will affect healthcare's stakeholders in different ways, depending on their geography, culture and financial condition. For many organizations, these forces will create problems. For others, they will give rise to opportunities. By reviewing the following 12 implications, healthcare's stakeholders can work toward needed changes today.

1. **Healthcare organizations that are consumer friendly will be winners**. Organizations, whether they be hospitals, medical groups or health insurers, must change their processes, technology and organizational structure with particular emphasis on delivery systems, attitudes and staff training. They must integrate eligibility, claims, referrals and authorizations into a customer-friendly process. Consumers will be increasingly stratified, with two of the largest categories being e-health and traditional patients. Although designing Web-based applications will be necessary for healthcare organizations, some consumers (those who still shun technology) will be averse to e-business encroachments into their healthcare delivery. Organizations must define, design and deliver the right customer experience for different types of consumers. Even those individuals who use the Internet as their primary health education source will want personalized solutions.

   Action items:
   (We recognize that the specific actions will depend on each organization's location, readiness for change and future development. However, we list these to begin the debate of what will be effective measures.)

   - Foster and reward a service culture
   - Reorganize internal processes to focus on consumers
   - Measure the patient "experience"
   - Design interactive customer feedback systems that address the increasing segmentation of consumers
   - Improve the processes for communications with customers through the use of Internet, mail, face-to-face and telephonic interactions. For example, create personalized Web pages for patients and encourage dialogue through e-mail and chat sessions
   - Provide patients with increased access to their medical records data

2. **Organizations must distinguish themselves through branding**. Consumerism will blur the lines between wellness, acute care, chronic care and long-term care. Through the Internet, geographic boundaries will also blur. In the United States, healthcare organizations engage in advertising, but few understand branding. In Europe and Canada, healthcare organizations have done neither. However, all healthcare organizations will need to brand both at the corporate and sub-brand levels to attract capital, customers and market share. Branding occurs over a sustained period of time and not without an investment in resources. Done well, branding is magic. Done poorly, market share either does not grow or erodes. Organizations need to decide who they're branding to – consumers, purchasers, physicians.

Action items:

- Determine the organization's strengths for branding purposes
- Understand the current operating and competitive environment
- Create an organization in which marketing, sales, service and products are interlocking functions working to support a consistent message
- Build expectations into the brand and ensure you can deliver on those expectations
- Actively manage your brand

3. **Service and speed will be keys to consumer satisfaction.** The Internet has fostered the notion of "I-time." To compete in "I-time," healthcare organizations must develop virtual brains – also known as knowledge management – so workers and management can learn from each other in a fast-changing industry. Healthcare organizations often lack market intelligence. Through knowledge management, they must collect, consolidate and analyze information to better understand their consumers, decision-making processes and perceptions of services relative to competitors. Health plans must also consider how their marketing and distribution models answer the demands of an empowered, connected consumer. The need for virtual networks is even more imperative today as medicine becomes less invasive and more knowledge intensive and computerized. Healthcare institutions will be more decentralized and virtual (linked by networks) and less institutional (all under the same roof). Organizations must simplify the billing/claims submission/reimbursement process for patients, providing online updates, access to their account information, or e-mails describing the status of claims and questions. They need to design e-scheduling systems and other way to make it easier for consumers to make appointments and get treatment.

Action items:

- Establish a knowledge management function
- Design clinical processes incorporating consumer expectations
- Use techniques used by other services companies, such as financial services, to deliver speedy customer service
- Create a customer service center to ease patients through the system efficiently
- Align culture with customer expectations
- Align financial incentives

4. **New E-business models will emerge and challenge present-day medical delivery vehicles.** The Internet gives the advantage to speed over size. Bureaucratic healthcare organizations will fail in this race to smaller, adaptive entrepreneurial ventures. New types of business models may break through in insurance and service delivery. One such model could be a Web-based virtual health plan that links with providers in numerous markets. Another could be virtual medical records warehoused through the Internet. Already, models that translate, format, reformat and transfer clinical and financial information are going forward. Such paperless transactions, in which intermediaries charge a per-transaction fee, will be plentiful. In many organizations, E-business strategies are in flux because of the speed of change going on. Even so, organizations need to look to partnering through the common platform of Web-based systems.

Action items:

- Understand and experiment with e-health ventures
- Proactively look for new types of partners
- Evaluate where the organization is in the e-commerce evolution

5. **The race for capital will hinge on the ability to demonstrate quality, efficiency and customer focus.** Healthcare organizations will compete for capital on the basis of current, quantifiable and competitive data. Their investors, whether they are governmental or private sources, will demand prudent expenditures in facilities, technology and organizational relationships. Losing the information race will mean losing the capital race. Organizations may need to divert capital from other priorities to invest in information technology. Healthcare organizations should focus on competencies they can measure and demand the same measurable results of their business partners. Outsourcing of some functions, such as information technology, business office services, lab, food service, housekeeping and facility management will accelerate. Although this is very common in the United States and Canada, it is just beginning in Europe. Government can encourage proper allocation of capital with both carrots and sticks. As for the stick, health authorities can regulate what types of new technologies and therapies are approved for reimbursement and efficacy. With a carrot of tax incentives, they can encourage innovation.

Action items:

- Hedge risks by partnering with e-business organizations
- Make performance measurable
- Reallocate capital, outsourcing non-core functions

6. **Functional silos in healthcare must be eliminated and replaced with seamless service.** Professionals may impede change as they cling to traditional frameworks. Physicians are becoming more coherently organized, which benefits purchasers who are trying to work toward efficient models of quality care. However, as physicians form larger networks, health networks are often destabilized and consumers are unsure about who their providers are. These turf battles among professionals contribute to a fragmented care path for consumers. Healthcare organizations need to work together toward a transparent system of care for consumers. Physician organizations may need assistance in consensus-building skills because their decision-making will depend on working together in adaptive organizations, not alone as independents.

Action items:

- Form cross-functional teams that align incentives
- Educate workers and professionals about the benefits of teaming
- Change the culture of the organization
- Change incentives to encourage buy-in from professionals

7. **Resources must be reallocated to retrain the workforce to deal with empowered consumers and technology.** E-business and medical technology may eliminate some practitioners and elevate others, depending on their perceived value. It also will foster new types of professional and technical careers. As society sees the dawn of genetic mapping, healthcare organizations must have professionals who can take on the concomitant

implications and responsibilities. Health professionals can no longer expect their initial education to carry them through a career. Healthcare organizations must become learning organizations. By using technology to attract and invest in staff, organizations may be able to avoid the costly turnover that plagues some aspects of the industry.

Action items:

- Use Web-based and computer-based training tools
- Provide incentives to become multi-skilled
- Use flexible, competency-based compensation
- Use technology to attract new staff
- Design user acceptance into new systems integration efforts
- Identify and mentor future leaders from the professions

8. **Payers must stress prevention because early detection and intervention will increase costs.** As a result of the Human Genome Project, consumers may begin getting their own individual genetic maps by 2010. Their risks for different diseases will be clearer, and they'll want to do something about those risks. In some cases, consumers may demand maintenance drugs or surgery to diminish their risks of certain diseases. In addition, as consumers understand more about their health risks, service niches could arise to treat anxious or depressed patients who are fearful of the future at hand. While genetic mapping may lead to more prevention, it also may mean that hospitals treat more severely ill patients, a trend that is already under way. Plan sponsors should pay more attention to the contribution of unhealthy behavior to poor health as they look for ways to incent healthy behavior. Purchasers must decide what is the right mix of co-payments and deductibles to incent cost-savings.

Action items:

- Use Internet to disseminate information to consumers more quickly
- Perform outcomes studies to determine benefits of early detection and use of preventive drugs and services

9. **Consumers will want more and won't want to pay for it.** There will be increasing demand on healthcare providers and purchasers to spend more on information technology and skilled workers to serve demanding consumers. Organizations with limited budgets will balk at such expenditures. However, organizations must look within to reduce overuse and misuse of medicine and a more efficient delivery process. At the same time, they should work toward conditioning consumers to expect less or pay more. Consumers often don't understand the costs involved in over-treatment.

Action items:

- Educate consumers about the trade-offs involved
- Design payment mechanisms that encourage consumers to be more cost-effective
- Develop more self-service delivery vehicles
- Reduce waste in the system through reduction in unnecessary variation in practice of care

10. **Ethical dilemmas will proliferate for consumers, providers and purchasers.** The Human Genome Project will push the envelope in terms of how medical information is collected, disseminated and organized. In addition, new waves of medical devices and drugs will elevate questions of medical necessity, personal responsibility and rationing.

Action items:

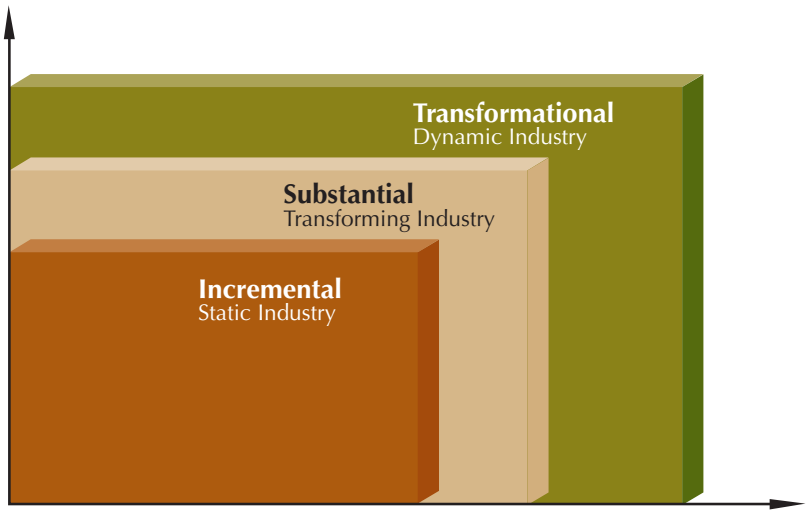
- Establish a bioethical framework in which to make decisions
- Consult with established bioethics departments at other institutions, such as academic medical centers and universities

11. **New opportunities for private health insurers outside the United States will expand rapidly.** As discussed earlier in this report, consumers in Europe, Canada, New Zealand and Australia are increasingly purchasing private insurance to supplement basic coverage. Consumerism will foster a demand for new services and products, many of which will not be paid for by basic coverage. As our HealthCast 2010 survey showed, however, insurers have a great deal of opportunity to leverage the benefits of e-business. As private insurers develop new models, e-business is certain to be incorporated into their plans.

Action items:

- Analyze international markets for expansion
- Determine product line offerings
- Leverage e-business competencies
- Look at entire benefit structure to determine spending priorities

Trends and Forces Move the Healthcare Industry from a Static to a Dynamic One



Industry Forces
- Consumerism
- E-business
- Genomics

Environmental Trends
- Technology
- Regulation
- Converging systems
- Workforce issues
- Standardization
- Aging

12. Medical professionals need to work toward global standards of medical treatment. In the United States, no national processes exist to develop standards of care. Even if a national organization existed to develop standards, there are few incentives for professionals to implement standards. The result has been widespread variation in medical standards from region to region. In Canada, organizations have been established in several provinces to examine practice patterns and to develop and promote standard practices. In Europe, many countries are working toward national standards, but there is no process to find common grounds among the European Union countries. Some European thought leaders have raised the issue of a basic health benefit package across the European Union. Such a product could greatly benefit governments, as well as employers interested in globalizing health benefit packages. However, it would also beg the need for global standards of medical treatment. One model may be Health Level Seven (HL7), which develops software specifications that allow disparate healthcare applications to exchange keys sets of clinical and administrative data.

Action items:

- Begin and support the debate on the benefits, costs and implications of regional and global standards
- Look to similar standardization efforts, such as ISO 9000 and HL7

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Footnotes

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PRICEWATERHOUSECOOPERS

United States

Woodrin Grossman
Chairman, Americas Theatre
woodrin.grossman@us.pwcglobal.com
214 754 7954

David Chin, M.D.
Principal
david.chin@us.pwcglobal.com
617 478 3381

Sandy Lutz
Project Team Manager and Author
sandy.lutz@us.pwcglobal.com
214 754 5434

Jack Rodgers, Ph.D.
Research Director
jack.rodgers@us.pwcglobal.com
703 918 3645

Europe, Middle East, Africa

Wim Oosterom
Chairman, Europe, Middle East, and Africa Theatre
wim.oosterom@nl.pwcglobal.com
31 30 219 1528

Lex Sigterman
Partner
lex.sigterman@nl.pwcglobal.com
31 30 219 1421

Hedwig Darley
Project Team Manager
hedwig.darley@nl.pwcglobal.com
31 30 219 5027

Wil Reijs
Researcher and Consultant
wil.reijs@nl.pwcglobal.com
31 30 219 1286

Canada

Rik Ganderton
Partner
rik.ganderton@ca.pwcglobal.com
416 941 8209

Neil Stuart
Partner
neil.stuart@ca.pwcglobal.com
416 815 5038

Australia and New Zealand

Sarah Prentice
Partner
sarah.prentice@au.pwcglobal.com
64 9 358 4888

Greg Anderson
Partner
greg.anderson@au.pwcglobal.com
61 2 8266 0000

Latin America

Osvaldo Bort
Partner
osvaldo.h.bort@ar.pwcglobal.com
54 11 4370 6000

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