

Health Communication in the New Media Landscape

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Editors

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*This book is dedicated to my wife, Jane, and our sons, Aaron and Adam,
who are the inspiration for all I do.*

—Jerry C. Parker

*This book is dedicated to my daughter, Kylie, who is on the brink of
discovering just how special she is. And to Margaret Duffy, who never
fails to share a great idea and a laugh—or two.*

—Esther Thorson

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Foreword

Advances in communication technology offer new and exciting opportunities to empower individuals and groups in relation to their health, to significantly enhance the quality of practice of health care and public health professionals, and to address inequities in people's access to health information and services. In order to ensure these results, however, the use of these technologies must be managed and directed appropriately, and technological tools must be made equitably available.

Communication is at the heart of health care and health promotion. Given that most people are driven by the need to influence factors that affect their lives (see "Enhancing Consumer Involvement in Health Care" by Hesse in this volume), it can be assumed that they will, where possible, respond to improved access to health information to make better-informed decisions. For their part, health professionals understand that the information that an individual needs is not limited to that provided in a clinic or hospital. More equal access to information, advice, and support through electronic means can be the foundation of partnerships that lead to higher-quality care and improved public health.

Through enhanced availability of health information, rapid advances in digital technology should promote greater equity and increased opportunities to make informed decisions. However, the products of technology have to be available in a form that is appropriate to the needs of those wanting to promote their own health or the health of others. There must be coherence between these needs and the tools available. For example, the Web will work for some, while e-mail, text messaging, video clips, telephone calls, and even reminders sent by mail will work for others. If the appropriate tools do not exist, they should be developed in partnership with the health consumer. Empowerment means linking the needs of people to the right tools and enabling participation in their development. Not only is access to information required, but a level of

“health literacy” is needed, and the means to acquire this is also not always equitable.

Health is also influenced by factors that cannot be easily changed by personal decisions, and the means to take action to mitigate risk from lack of clean water, sanitation, safe food, and a clean and secure environment vary widely across societies and the globe. However, even where there is a lack of basic services, wireless technology may be used to notify authorities of outbreaks of disease, which will enable more rapid containment and alert populations as to external threats. In addition, the Internet has great utility in enabling access to information or technology, for example through telemedicine, in situations where there is absence of or limited access to professionals.

The Internet can also enable access to social networks for the purpose of support or as an aid in health promotion. Personal contact with peers, friends, family, and the health professions will remain important but can be complemented by electronic ways of securing advice and support. This can translate into availability of knowledge and access to virtual communities, even where health care and public health services are not optimal.

Along with these benefits, rapidly developing communications technology brings real challenges for both health professionals and the public. The huge number of research findings published, disseminated, and reported on daily have to be interpreted by one and understood appropriately by the other. The creation and widespread availability of new knowledge is way ahead of the means to make use of that knowledge. The science of informatics can assist in the presentation of information, but translation of knowledge is necessary. There is now greater access to health portals, reviews, and authoritative advice, and decision makers at all levels of government will need assistance in translating this knowledge to help them make the most appropriate policy decisions.

There are also other forces at play that can easily negate efforts to improve health. We cannot ignore the negative influences of the new media in promoting unhealthy foods and tobacco, for example. We can look to the social sciences to assist us in understanding why such efforts are effective and perhaps use the same methods for a positive effect on health.

Given the high prevalence of chronic diseases in many populations, small reductions can result in major advances in population health status. In addition, acceptance of public health strategies such as immunization can prevent acute disease, which puts extra strain on overburdened

health systems. Communication of risk during acute events is a fundamental part of public health practice and enables individuals and decision makers to make appropriate decisions at times of crisis as well as helping health or emergency response authorities to better manage an event. Opportunities offered by the new media can be used as an additional means to influence avoidable mortality and morbidity, which should not be ignored.

This book is a glimpse into the world of the new media; the authors present analyses of evidence of the utility of new opportunities in a wide variety of health environments. The chapters predominately focus on health issues in the United States, but evidence of the usefulness of new media and the needs of individuals and communities can and should be considered by those with an interest in health promotion, care, and treatment around the globe. In this volume there are examples of how advances in technology not only empower individuals in their interactions with a health system but also enable health professionals to better tailor their work and time for the benefit of patients and clients.

Computers, which dominate our lives, should augment, not replace, human thought (see “Enhancing Consumer Involvement in Health Care” by Hesse in this volume). Our goal should be to promote the equitable distribution of tools so that we use advancing technology—the new media—to benefit health for all.

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Preface

In recent decades, the growth in medical knowledge has been dramatic. Over 10,000 randomized, clinical trials are conducted annually, and the budget of the National Institutes of Health has grown to over \$30 billion. Innovative research in areas such as genomics, cell restoration, diagnostic imaging, prosthetics, and rehabilitation all hold the potential to greatly improve health and to reduce disability for millions of people across the globe. Yet compelling evidence suggests that the rapid scientific advances in the fields of health care and medicine are not being effectively translated into improved health outcomes.

Unfortunately, these well-documented failures are occurring at a time when health care demands are expanding. Citizens in both developed and developing countries are living longer, and the percentage of the global population older than age 65 is rapidly increasing. As a result, a higher percentage of the population is living with one or more chronic diseases—many of which would be potentially preventable if evidence-based public health information were effectively translated into practice. Currently, the diffusion of information into the awareness of the general public (including health care practitioners) is frequently passive and even serendipitous. Health-related research is typically presented at professional conferences and published in scientific journals, but only a fraction of this information finds its way into the mainstream, public media on the basis of selected stories that journalists and editors deem newsworthy. Equally problematic, the news reports on scientific research are often exceedingly narrow and do not effectively place new research findings into an appropriate scientific context. In short, news reports to the public generally do not provide a framework for behavior change or for immediate application; they also are often contradictory. Furthermore, the uneven adoption of evidence-based, health-related research across racial and socioeconomic groups contributes to disparities in health care outcomes.

Digital technologies appear to present tremendous opportunities for the dissemination of health-related and rehabilitation information. Indeed, the transformation of the spectrum of human communication as a result of advances in electronic media capability is occurring in dramatic fashion. E-mail, digital commerce, online television, cell phones, iPods, and the general integration of all traditional modes of mass communication onto the Internet have resulted in fundamental changes in how the citizens of the world approach their basic communication needs; the rapid adoption of electronic communication is reflected by instant messaging, blogging, photo sharing, social networking, and video downloads, among other digital capabilities.

This dramatic change in human behavior which is occurring as a result of the new media landscape also poses many challenges. Certainly, the new media landscape raises fundamental questions about how people interact with communication systems. For example, what will be the role and meaning of “news” in the new landscape? How will people’s perceptions of what is important and what is valued be altered? How will people learn about health-related issues and health care? How will persons with chronic diseases learn about resources, support systems, and rehabilitation? What will be the impact of the new media landscape on health care providers and on health care policies? This text seeks to summarize what is known about these compelling questions.

Jerry C. Parker, PhD
Esther Thorson, PhD

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Health Communication:
Current Status
and Trends

PART
I

1

The Challenge of Health Care and Disability

**JERRY C. PARKER, REBECCA L. WOELFEL,
ERIC S. HART, AND GORDON BROWN**

With few exceptions, the delivery of health care and the reduction of disability are challenges for all nations and cultures. In the developing world, access to health care is often severely limited, and programs for reducing disability are, likewise, often unavailable. Even in developed nations, systems for delivering health care and reducing disability are frequently fraught with problems, although the nature of the problems and the strategies used to solve them vary widely.

Indeed, each nation or society defines “health care” in its own way and develops its own diagnostic and treatment theories, practices, and tools to provide services that may range from cures to rehabilitation to stabilization to the provision of comfort and palliative care (Jonas, Goldstein, & Goldstein, 2007). The sum of all programs and institutions that promote the work of diagnosis and treatment in a given society can be labeled the health care system for that society (Jonas et al., 2007).

To understand the challenges of health care and disability, an appreciation of the concept of health is necessary. According to the World

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Health Organization (1946), “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” Jonas and associates (2007) discuss a similar definition put forth by the International Epidemiological Association that describes health as “A state characterized by anatomical, physiological and psychological integrity, ability to perform personally valued family, work, and community roles; ability to deal with physical, biological, psychological and social stress; a feeling of well-being; and freedom from the risk of disease and untimely death” (p. 3). These particular definitions of health, and many others, are exceedingly broad. Health care systems are rarely able to promote health and well-being in this idealized manner.

Any definition of health begets the question of what determines health. Jonas and associates (2007) describe the key determinants of health as genetic inheritance, physical environment, social environment, health behavior, and adequacy of health care. A similar framework for the determinants of health has been provided in *Healthy People 2010*, which is a comprehensive plan for promoting healthy living and reducing health disparities in the United States (U.S. Department of Health and Human Services, 2000); a schematic diagram of the determinants of health is shown in Figure 1.1. In the figure, the individual is depicted in the center; the health of a given individual is shown to be directly influenced by biology (e.g., genetic inheritance, unique biological functioning) and by personal behaviors that have relevance for health (e.g., diet, physical activity, substance use, tobacco use, sexual behavior, risk-taking behaviors). The diagram also conveys that an individual resides within unique physical and social environments that can exert an influence on health status. The physical environment may affect health status in numerous ways (e.g., air quality, sanitation, health hazards/violence, presence of toxins), whereas the social environment may influence health status through mechanisms such as the degree of social support, the magnitude of interpersonal stress/conflict, and the level of socioeconomic well-being.

Figure 1.1 also conveys that health status is determined by access to appropriate health care (or lack thereof), including the availability of primary, secondary, and tertiary health care services. Similarly, the policies and conventions within a given health care system can exert an influence on the health status of an individual (e.g., magnitude of health care expenditures, decisions regarding health care priorities). Although the *Healthy People 2010* model for the determinants of health was conceptualized in the context of the U.S. health care system, the general framework

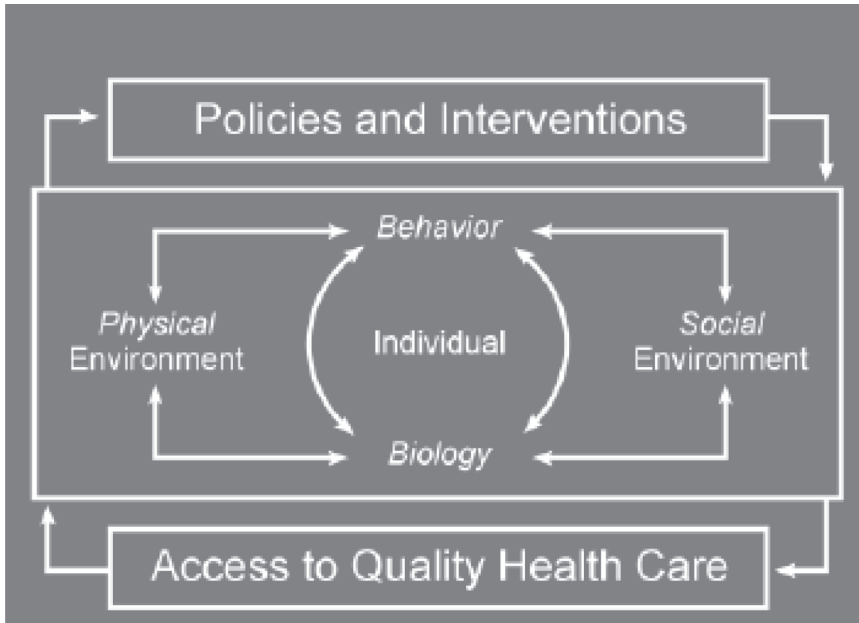


Figure 1.1 Determinants of Health

appears to have relevance for other nations, societies, and cultures. This chapter will examine the challenge of health care and disability in the United States and abroad from the standpoints of chronic disease, access to care, quality of care, and macroeconomics and will introduce the potential contributions of health communication technologies.

ASSESSING THE HEALTH OF NATIONS

A comparative analysis of the performance, outcomes, and quality of international health care systems is exceedingly complex, and an in-depth discussion of this literature is well beyond the scope of this chapter. Yet assessments of the health of nations have been performed, and those nations that spend the most on health care are not necessarily the same ones that achieve the best outcomes for their citizens. For example, Nolte and McKee (2008) conducted analyses that were based on the construct of “amenable mortality,” which refers to deaths that occur as a result of causes that would not be expected to result in death if timely and effective health care were available.

Specifically, Nolte and McKee (2008) compared the United States to 14 European nations, Canada, Australia, New Zealand, and Japan between 1997 and 1998 and again between 2002 and 2003, analyzing trends in amenable mortality in persons under age 75. Between the two assessments, there was an average decline of 16% in amenable mortality across all nations. However, the United States was a statistical outlier with a decline of only 4%; the data revealed that the United States did not experience a decline in amenable mortality at the same pace as other industrialized nations. Furthermore, the data suggested that the relative failure of the United States to reduce amenable mortality was associated with a lack of progress in reducing deaths associated with ischemic heart disease and other circulatory diseases, especially stroke. Nolte and McKee observed that the lack of progress in reducing amenable mortality coincided with an increase in the uninsured population of the United States. Although all nations face unique health care challenges, the United States is an example of a health care system for which the magnitude of the financial investment has not yielded the desired outcomes.

OVERVIEW OF HEALTH STATUS IN THE UNITED STATES

Burden of Chronic Diseases

One indisputable fact is that everyone will die of something—so why be concerned about deaths from chronic disease? The reality is that, by definition, deaths from chronic disease are not quick; these deaths are often protracted, painful, and premature. Furthermore, deaths from chronic disease typically take an enormous toll on the affected individuals, their families, and the economic systems in which they live.

According to data from 2001, chronic disease claims the lives of more than 1.7 million Americans each year (Centers for Disease Control and Prevention, 2004). Specifically, five chronic diseases account for more than two-thirds of all deaths in the United States; these five diseases are heart disease, cancers, stroke, chronic obstructive pulmonary diseases, and diabetes. A survey by the Kaiser Family Foundation in 2005 found that 44% of the U.S. population lives with a chronic health condition such as heart disease, cancer, asthma, diabetes, or other handicaps/disabilities that affect daily functioning (Kaiser Family Foundation, 2005). Recent data from the Centers for Disease Control and Prevention (2005a) indicated that more than 90 million persons in the United

States are living with a chronic health condition. As might be expected, persons with chronic diseases encounter difficulty obtaining appropriate health care due to the high costs associated with these conditions, and they are more likely to report financial burdens as a result of overdue medical bills (Kaiser Family Foundation, 2005).

Chronic diseases are the greatest contributors to mortality in the United States. In 2004, cardiovascular diseases accounted for over 872,000 deaths in the United States, which represented 36% of all deaths in the nation (U.S. Department of Health and Human Services & National Institutes of Health, 2007). Cerebral vascular disease alone was the third-leading cause of death in 2004 and accounted for approximately 150,000 lost lives (U.S. Department of Health and Human Services & National Institutes of Health, 2007). In 2001, approximately 550,000 deaths in the United States (23% of all deaths) were due to cancer (Centers for Disease Control and Prevention, 2004); 30% of these deaths could be attributed directly to smoking, and all smoking-related deaths are potentially preventable (Centers for Disease Control and Prevention, 2004). Approximately 18 million Americans have diabetes, and roughly 5 million of these persons are not even aware that they have the condition (Centers for Disease Control and Prevention, 2004). In 2001, diabetes was the sixth-leading cause of death in the United States and accounted for approximately 71,000 lost lives; deaths from diabetes may be underestimated because secondary complications are commonly listed as the cause of death on death certificates.

Risk Factors for Chronic Disease

To a great extent, chronic diseases are a reflection of the behaviors that Americans engage in (or do not engage in) as they go about their daily lives. The behaviors that are the most damaging to the health of Americans and that contribute the most to chronic diseases include tobacco use, failure to engage in sufficient physical activity, and failure to adhere to healthful dietary practices (Centers for Disease Control and Prevention, 2004). Specifically, the tendency for Americans to be overweight has emerged as a major public health issue; a survey conducted during 1976–1980 and followed up in 2002 found that the prevalence of obesity in the United States had doubled (Centers for Disease Control and Prevention, 2005b).

This trend toward obesity starts early in life. Ogden, Flegal, Carroll, and Johnson (2002) found that 15% of 6- to 19-year-olds were overweight;

10% of 2- to 5-year-olds were found to be already overweight. The National Health Nutrition Examination Survey shows that the percentage of overweight children and adolescents tripled from 5% in 1980 to 15% in 1999–2000 (Ogden et al., 2002). These trends appear to be a result of both unhealthy dietary habits and insufficient physical activity; 300,000 deaths per year in the United States are associated with unhealthy eating habits and sedentary lifestyles. In 2002, over 75% of U.S. adults reported not eating the recommended daily quantities of fruits and vegetables (Centers for Disease Control and Prevention, 2004). Based on data from the 2006 National Health Interview Survey, 62% of adults reported not engaging in vigorous leisure-time physical activity of 10 minutes or more per week, although 24% did report engaging in such activity three or more times per week (Pleis & Lethbridge-Cejku, 2007). Using body mass as the criteria, the survey categorized 35% of adults as overweight (but not obese) in 2006, and 26% as obese (Pleis & Lethbridge-Cejku, 2007).

In the United States, approximately 45 million persons smoke tobacco products (Centers for Disease Control and Prevention, 2007). The data also reveal that the rate of decline in smoking among young people has largely stalled, and approximately 3,900 young people initiate smoking activity each day in spite of the extensive evidence linking smoking and adverse health consequences (Centers for Disease Control and Prevention, 2005c). Accordingly, approximately 8.6 million Americans suffer from the consequences of tobacco use, including heart disease, emphysema, and other smoking-related conditions and approximately 440,000 Americans die each year as a result of diseases that are attributable to smoking (Centers for Disease Control and Prevention, 2005c). Nearly 10% of these smoking-related deaths are due to secondhand smoke (Centers for Disease Control and Prevention, 2005c). An inverse relationship exists between smoking and educational level; people with less education are more likely to use tobacco products (Centers for Disease Control and Prevention, 2007).

Health Care Access

Access to health care is a major issue for many U.S. citizens under the age of 65 and for those who are not eligible for public assistance. Specifically, in 2006, nearly 44 million people in the United States (14.8%) were without health insurance (Cohen & Martinez, 2007), which severely restricts their access to care in the context of rising health care costs. Not

surprisingly, persons who do not have health insurance are less likely to receive recommended health services; analyses of the 2002 Behavioral Risk Factor Surveillance System revealed decreased use of cancer prevention services, cardiovascular risk reduction services, and diabetic management among persons without health insurance compared to those with health insurance (Ross, Bradley, & Busch, 2006). Even among persons with higher incomes, lack of health insurance coverage was associated with decreased use of preventive health care services (Ross et al., 2006).

Iglehart (2002) found that the relative contribution of employers to health care is decreasing and that the contributions of workers are rising. Thus, out-of-pocket health care expenditures are creating a major financial burden for many Americans.

Indeed, financial concerns are a major barrier to care for persons with major health conditions. A Kaiser Family Foundation survey in 2005 found that 24% of persons with major health conditions, as opposed to only 14% of healthy persons, reported that health care costs were their biggest monthly expense after rent or mortgage. In addition, 29% of persons with chronic health conditions, as opposed to only 16% of healthy persons, reported having an overdue medical bill. Of those with chronic health conditions, 28% reported not being able to afford health care, even though 62% had some form of health insurance. The greatest cause for concern was that 29% of those who could not afford medical care reported skipping medical treatment, cutting pills, or not having a prescription filled as a result of limited funds.

Even for persons who are fully employed, health care in the United States is often not affordable. Specifically, high deductibles, gaps in coverage, and an unfortunate pattern of claims denials can place the working poor on the brink of financial disaster (Shipler, 2004). Access to health care also is not equal for all segments of American society; race, culture, and socioeconomic class play undeniable roles in numerous ways, including the responsiveness of providers, the ability to communicate health care needs, and the potential for mistrust on the part of underrepresented minorities. These health care disparities have been well documented in the IOM report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* (Smedley, Stith, & Nelson, 2002).

Health Care Quality

According to the Institute of Medicine, health care quality is defined as “the degree to which health services for individuals and populations

increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (Institute of Medicine & Committee to Design a Strategy for Quality Review and Assurance in Medicare, 1990, p. 21). However, the assessment of health care quality represents a major challenge that can be approached from the standpoints of populations, individual health outcomes, clinical effectiveness, and patient safety. Strategies for improving health care quality often involve information technology and the communication of critical information to providers and/or consumers. For example, research in the area of clinical effectiveness frequently results in the publication of evidence-based practice guidelines, but such guidelines must be effectively communicated and ultimately adopted by practitioners if improved outcomes are to accrue.

Similarly, there is a growing awareness that medical errors are a major problem that compromises health care quality; the IOM report *To Err Is Human* (Kohn, Corrigan, & Donaldson, 1999) estimated that nearly 100,000 deaths occur annually in the United States as a result of mistakes associated with health care services. Medication errors alone have been estimated to account for over 7,000 deaths annually (Phillips, Christenfeld, & Glynn, 1998). Surprisingly, in 1998, more people died as a result of errors in the U.S. health care system than from motor vehicle accidents (43,458), breast cancer (42,297), or AIDS (16,516) (Martin, Smith, Mathews, & Ventura, 1999). The root causes of medical errors vary, but one key component involves inadequate clinical information systems that inhibit access to timely and complete patient information. In fact, Woolf, Kuzel, Dovey, and Phillips (2004) examined a series of anonymous medical error reports and found that 67% of the cases were set into motion by errors in communication; they describe numerous examples of miscommunication, including information breakdown among colleagues and/or with patients, misinformation in the medical record, mishandling of patient requests/messages, inaccessible medical records, and inadequate reminder systems. Compelling evidence exists that inadequate communication systems play a key role in many of the errors of diagnosis and treatment that occur in health care settings.

Disability in America

The Americans with Disabilities Act defines an individual with a disability as someone who has a physical or mental impairment that substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment. A sizable portion of U.S. citizens

are living with some form of disability that affects their daily functioning and has the potential to alter their quality of life. The 2006 Disability Status Report for the United States (Rehabilitation Research and Training Center on Disability Demographics and Statistics, 2007) found that the prevalence of disability for persons ages 21 to 64 years was nearly 13%. For persons ages 65 to 74 years, the prevalence of disability was over 30%; for persons over age 75, the prevalence of disability was nearly 53%.

Disability confers major disadvantages in areas related to income, employment, and overall financial well-being. In 2006, the employment rate for adults with disabilities between the ages of 21 and 64 years was only 38%, which is far less than the national average. In 2006, the median annual household income of working-age persons with disabilities in the United States was \$36,300, and the poverty rate was over 25% (Rehabilitation Research and Training Center on Disability Demographics and Statistics, 2007). Not surprisingly, these types of socioeconomic disadvantages for persons with disabilities create secondary stressors in many areas, including access to health care.

In fact, access to health care is a profound problem for persons with disabilities. Shigaki, Hagglund, Clark, and Conforti (2002) found that 74% of persons with disabilities who reported needing health care services encountered difficulty accessing at least one service; persons with spinal cord injury reported the greatest difficulty accessing health care services (87%), followed by persons with brain injury (79%) and persons who had experienced stroke (65%). They reported that dental services were the most difficult to access, but that problems also were encountered accessing personal care attendants, medical supplies, eyeglasses, durable medical equipment, physical therapy, and specialty medical care, among numerous others.

A common reason for failure to access health care was found to be limitations in Medicaid coverage (Shigaki et al., 2002). Many persons with a disability face employment challenges and transportation barriers and, accordingly, have limited incomes. Gaps in Medicaid coverage and other components of the U.S. health care “safety net” create profound problems for many Americans who do not have health insurance or substantive financial resources, but this is particularly the case for persons with disabilities.

Health Care Expenditures

Recent data from the Center for Medicare and Medicaid Services indicate that \$1.9 trillion was spent on U.S. health care in 2004; this

translates to \$6,697 per person (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, & National Center for Health Statistics, 2006). Health care spending accounted for 16% of the U.S. gross domestic product in 2004, which was greater than for any other developed country participating in the data collection of the Organization for Economic Cooperation and Development. Personal health care expenditures, including spending for hospital care, physician services, nursing home care, dental care, and other medical services, accounted for 83% of the \$1.9 trillion spent on health care in 2004.

The U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention, and the National Center for Health Statistics (2006) have provided data on the sources of funding and the categories of expenditures for health care in 2004. Thirty-six percent was paid by private health insurance, 34% by the federal government, 11% by state or local governments, 15% in out-of-pocket spending, and the remainder from other private funds. With regard to categories of expenditures, 37% was paid for hospital care, 26% for physician care, 12% for prescription drugs, 7% for nursing home care, and 18% for other personal care, such as visits to nonphysician medical providers, and medical supplies. Hospital care expenditures declined by 9% from 1980 to 2004 (due to efforts to reduce bed days of care), whereas prescription drug expenditures doubled.

Reports from the Centers for Disease Control and Prevention (2005a) have shown that escalating health care expenditures cannot effectively be addressed without recognition of the costs associated with chronic diseases. Recent estimates suggest that chronic diseases account for 75% of the total amount spent on health care in the United States (Centers for Disease Control and Prevention, 2005a). Regarding specific conditions, spending is currently approaching \$128 billion annually for the combined direct and indirect costs associated with arthritis; the direct and indirect costs associated with smoking exceed \$193 billion annually. In 2001, \$300 billion was spent on treatment for cardiovascular diseases, and approximately \$132 billion was spent on diabetes (Centers for Disease Control and Prevention, 2005a). Therefore, even small reductions in the prevalence of chronic diseases could result in major savings within the U.S. economy.

Future Challenges

In 1900, life expectancy for Americans at birth was 47 years (Kotlikoff & Burns, 2005); today, life expectancy at birth is approximately 76 years

and rising. As a result of factors such as better nutrition and advances in health care, Americans are generally living much longer. Data from the U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention, and the National Center for Health Statistics (2006) indicate that men are now expected to live 3 years longer than they did in 1990, and women are now expected to live 1 year longer than they did in 1990. In addition, mortality rates for many conditions are declining, so the population of persons age 65 and over in the United States is expected to increase from 12% in 2000 to nearly 20% by 2030 (Centers for Disease Control and Prevention, 2003).

The dramatic increase in longevity, however, has been occurring at the same time that birth rates in the United States have been declining (Kotlikoff & Burns, 2005). Taken together, these combined trends are resulting in the “graying of America,” or the more rapid growth of the percentage of persons over age 65 than the percentage of persons in younger age groups (Kotlikoff & Burns, 2005). Consequently, in the future, an increasingly smaller percentage of working-age U.S. adults will be producing the revenue to fund the social programs that will support an increasingly larger percentage of older Americans.

These demographic trends are worthy of more than casual interest; they have profound implications for the economic future of the United States. In 2008, the oldest baby boomers will be eligible for retirement, and Social Security benefits and Medicare claims will follow not far behind. Indeed, the benefits associated with these federal programs have been promised to future generations, even though they have not been funded in a sustainable manner. Accordingly, the potential funding shortfall for Social Security and Medicare programs is staggering. Currently, the gross official federal debt for the United States is approximately \$9 trillion (U.S. Government Accountability Office, 2007). However, the gross official federal debt does not take into account the implicit debt that is inherent in future Social Security and Medicare commitments. The Social Security component of the U.S. implicit debt has been estimated to be \$22 trillion; the Medicare component has been estimated to be an additional \$50 trillion. These two underfunded programs alone combine for a total implicit U.S. debt of approximately \$72 trillion. It has been estimated that to meet debt of this astounding magnitude, today's workers would have to contribute all their earnings to debt retirement for a period of 10 years (Kotlikoff & Burns, 2005). Therefore, the massive debt obligations associated with Social Security and Medicare pose a tremendous challenge to the sustainability of these programs (in their

current form) and, indeed, to the economic future of the United States as a whole.

OVERVIEW OF WORLDWIDE HEALTH STATUS

In a figurative sense, the world is becoming “flat” (Friedman, 2005). Specifically, a confluence of forces are operating that, in profound ways, are reducing communication and trade barriers between nations; these forces include the migration toward capitalistic economies in previously communist countries (e.g., the former Soviet Union and China), the emergence of the Internet and related digital technologies, the development of workflow software that facilitates remote participation in commercial activities, and a growing international workforce that is willing to work for relatively low wages (Friedman, 2005). Although possibly less apparent, these trends toward globalization have important implications for worldwide health care. Specifically, the disease profile of the world is undergoing rapid change (World Health Organization, 2005). Although infectious diseases have historically been the major public health concern in developing nations, the total number of people dying of chronic diseases is now twice as high as those dying of the combination of infectious diseases, maternal/perinatal conditions, and nutritional deficiencies (World Health Organization, 2005). More specifically, the emerging epidemics of heart disease, stroke, cancer, and other chronic diseases are beginning to take a tremendous toll in terms of worldwide deaths and disability (World Health Organization, 2005). Without a doubt, there continues to be a tremendous need to address communicable diseases such as HIV/AIDS. There also continues to be a major concern regarding the potential for worldwide pandemics involving infectious conditions such as avian flu. However, trends toward globalization, dietary changes, and migration away from agrarian lifestyles are beginning to introduce a new set of health-related challenges throughout the world.

The health-related impact of globalization is complex, but it involves a dietary transition in low- and middle-income countries toward the consumption of foods that are high in fats, salts, and sugar (World Health Organization, 2005). On the demand side, rising incomes from increased economic productivity have created the ability to purchase processed foods and have reduced the time people have for food production and preparation. On the supply side, a greater percentage of the worldwide population is becoming reachable through marketing and promotional

campaigns that encourage consumption of unhealthy foods. Notably, a significant portion of global marketing is now targeted at children (World Health Organization, 2005), which has major implications for the health of future generations. Already, body mass indicators and total cholesterol levels are increasing as national incomes rise in developing countries (World Health Organization, 2005), and approximately 50% of the worldwide population now lives in urban environments, which tend to promote a sedentary lifestyle (World Health Organization, 2005). In addition, as is occurring in the United States, the global population is aging, and the prevalence of persons age 65 and over is projected to reach 973 million worldwide by 2030 (Centers for Disease Control and Prevention, 2003). These trends increase the probability of chronic disease (World Health Organization, 2005). Other risk factors that are known to contribute significantly to global chronic disease include tobacco use, excessive alcohol consumption, and high blood pressure (World Health Organization, 2005).

In spite of the “flattening” world, poverty continues to be a reality for a large segment of the global population, and poverty itself is a risk factor for chronic disease. Poverty occurs in all countries, even the most affluent. Economic deprivation restricts people’s access to the essential elements for a healthy life, such as affordable foods, nutrient-rich diets, adequate housing, and access to health care. Poverty also is associated with psychological stress, high-risk behaviors (e.g., tobacco use), and generally unhealthy living conditions. In addition, concerns about physical safety in economically deprived environments often restrict physical activity, and cardiovascular disease has been found to be more prevalent in deprived communities than in affluent ones (Stronks, van de Mheen, & Mackenbach, 1998; Sundquist, Malmstrom, & Johansson, 2004). In poverty-stricken environments, the availability of preventive care, diagnostic services, clinical interventions, and transport to health facilities and access to medications are typically limited (Goddard & Smith, 1998; Lorant, Boland, Humblet, & Deliege, 2002). Persons who live under conditions of economic deprivation also frequently face health care disparities in comparison to persons with greater financial means. Specifically, persons with low incomes are often marginalized within health care systems and do not receive optimally responsive health care services (Goddard & Smith, 1998).

Once chronic disease develops, a downward spiral toward increasing poverty often begins. Persons with chronic diseases are less able to work and hence to generate incomes, so their living conditions tend to

deteriorate even further. If a person who becomes ill happens to be the income earner for a family, the living conditions and health status of the entire family, including children and the elderly in multigenerational households, may suffer.

In all nations, there are macroeconomic dimensions to chronic disease. These dimensions include the direct costs of providing health care services, the indirect costs associated with lost productivity, and, in some countries, the loss of national income associated with premature mortality (World Health Organization, 2005). Figure 1.2 shows the projected annual reduction in GDP associated with deaths due to heart disease, stroke, and diabetes in 2005 and as estimated for 2015; the Russian Federation is expected to face an annual reduction in GDP of more than 5% by 2015. Accordingly, for most nations, strong economic incentives exist to reduce chronic disease, and viable strategies are available to improve health-related outcomes; these include laws/regulations (e.g., water fluoridation), taxation to reduce unhealthy behaviors (e.g., cigarette taxes), improvement of public infrastructure (e.g., walking and biking paths), community-based advocacy (e.g., promotion of smoke-free environments), and public education (e.g., programs to improve nutrition and physical activity). In spite of isolated successes, the overall global

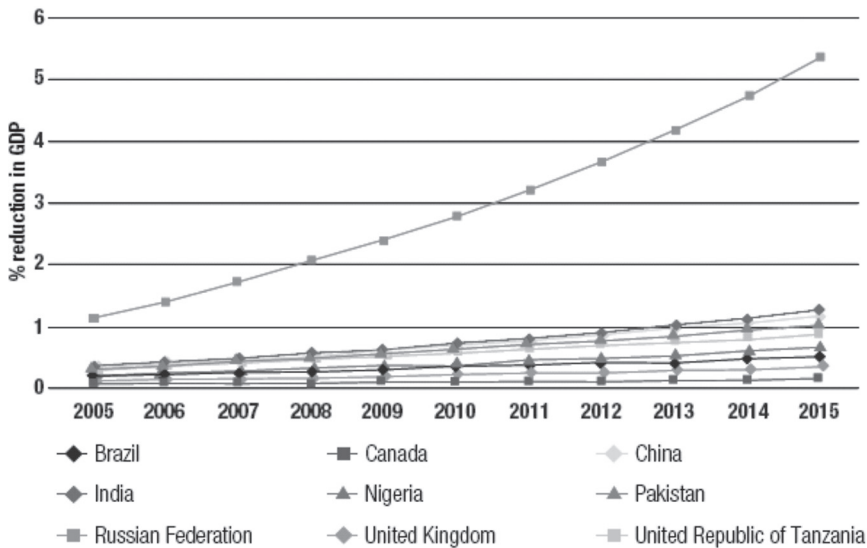


Figure 1.2 Projected Annual Reduction in GDP from Deaths Due to Heart Disease, Stroke, and Diabetes as Proportion of GDP, 2005–2015.

response to chronic disease remains inadequate (Yach, Hawkes, Gould, & Hofman 2004).

MEETING THE HEALTH CARE CHALLENGE

Patient-Centered Health Care

A 2020 vision for health care has been provided by Davis, Schoen, and Schoenbaum (2000) and elaborated by Davis, Schoen, and Audet (2005). Although the vision was conceptualized for U.S. health care, the principles appear to be relevant from a global perspective, even though intermediate achievements likely would be needed in developing countries. Davis, Schoen, Audet, and Schoenbaum describe a vision of affordable health insurance, accessible health care, patient-centered care, information-driven care, and integrated quality improvement systems. They also envision care that is predicated on the latest scientific evidence and supported by robust clinical information systems.

Interestingly, many of these elements of a 2020 vision for health care involve communication systems in one form or another. For example, as described by Davis and associates (2005), patient-centered care involves access to health services that are augmented by digitized communication allowing patients to select their own appointments, to receive timely responses to e-mails, and to obtain electronic prescription refills, among numerous other features. This vision involves active consumer engagement in care, as reflected by well-developed information systems that have the ability to transmit data on health care conditions/problems, treatment options, and treatment plans. Information would be made available to both providers and consumers in the form of reminders and alerts for preventive care or whenever abnormal findings emerge. Consumers would have access to their electronic medical records and be able to receive information that could inform behavior change, patient education, and counseling/guidance.

In addition, Davis et al. (2005) envision access to clinical information systems that would support quality improvement through mechanisms such as patient registries, monitors of adherence, and informed decision making. The patient-centered vision involves effective communication among health care providers and the efficient transfer of clinical information across a virtual provider network; continuous feedback systems would exist in the form of automated patient surveys to facilitate practice

improvement. Lastly, Davis and associates envision publicly available information databases that would help consumers select providers and/or health care facilities on the basis of performance on definable standards of care.

Disruptive Innovations in Health Care

The gap between current health care systems and the idealized vision of patient-centered care is profound. A realistic strategy for bridging this tremendous gap is hard to conceptualize, but Christensen, Bohmer, and Kenagy (2000) describe the possibility of “disruptive innovations” in health care. The key principle is that simpler, less expensive alternatives to costly, inefficient care are possible, but that fundamental disruptions to existing systems and institutions will be required for the necessary changes to occur. Christensen and associates note that prior to 1980, persons with diabetes could only learn their glucose levels through inaccurate urine tests or by visiting a clinic where a blood sample could be drawn and laboratory-based measurements could occur. Today, persons with diabetes are able to carry miniature blood glucose meters wherever they go, which permits them to easily access information that allows self-management of many aspects of a disease that previously required intensive physician management. The advent of miniature blood glucose monitors is an example of a disruptive innovation; endocrinologists experienced less demand for their services, clinic revenues for diabetes care decreased, and the companies that made the large laboratory-based equipment for blood glucose testing were forced to leave the market. More specifically, a technologic innovation that permitted information to be made directly available to people with diabetes at the point of decision making resulted in notably improved (and less expensive) health care.

OPPORTUNITIES IN THE NEW MEDIA LANDSCAPE

In the new media landscape, developments in the fields of information technology and communication systems may enable disruptive innovations and creative solutions that can be brought to bear on many challenging health care problems. The availability of information at the optimal time and place may better inform lifestyle choices, promote preventive health care, improve interdisciplinary coordination of care, and enable more informed selections of health care providers and services. For example,

Woolf, Krist, Johnson, Wilson, Rothemich, Norman, and Devers (2006) found that even a well-designed Web site can promote improvements in stage of change and health behaviors over a short-term follow-up. Several recent studies and editorials also have made a strong case that the basic Google search engine itself will have a substantial impact on clinical decision making and consumer behavior over time (Giustini, 2005, 2006; Tang & Ng, 2006). Through the use of advanced bioinformatics technology, the practice of medicine in the future is expected to personalize health care through access to an individual's unique genetic profile (Giustini, 2007).

Until recently, physicians possessed specialized knowledge to which patients had limited access, but now patients who are willing to invest sufficient time and energy may come to know as much (or more) about a condition than do their providers (Christensen, Anthony, & Roth, 2004). Indeed, the following chapters in this volume explore the various ways that information technology and health communication systems can be used to address challenging health care problems. Although the gap between health systems at the beginning of the 21st century and the ideals of patient-centered care is enormous, there is reason to hope that health communication opportunities in the new media landscape will assist both developed and developing nations to move toward creative, “disruptive” solutions and improved health status for their citizens.

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